FILE COPY

ORNL-5057
672

Indexed Bibliography on Tritium

Its Sources and Projections, Behavior, Measurement and Monitoring Techniques, Health Physics Aspects, and Waste Management

ChemRisk Document No. 713

#713

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION FOR THE U.S. ATOMIC ENERGY COMMISSION

Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
Price: Printed Copy $13.60; Microfiche $2.25

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the Energy Research and Development Administration, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

ORNL-5057
UC-41 — Health and Safety

Contract No. W-7405-eng-26

Health Physics Information System

INDEXED BIBLIOGRAPHY ON TRITIUM

ITS SOURCES AND PROJECTIONS, BEHAVIOR, MEASUREMENT AND MONITORING TECHNIQUES, HEALTH PHYSICS ASPECTS, AND WASTE MANAGEMENT

M. N. Dixon
C. F. Holoway
B. L. Houser
D. G. Jacobs

AUGUST 1975

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
UNION CARBIDE CORPORATION
for the
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

TABLE OF CONTENTS

		Page
Foreword		v
Acknowledgements		vi
Abstract		vii
I	Sources and Projections	I-1
	Keyword Index	I-43
	Author Index	I-51
	Permuted Title Index	I-55
II	Operating Experience	II-1
	Keyword Index	II-27
	Author Index	II-33
	Permuted Title Index	II-35
III	Handling Procedures	III-1
	Keyword Index	III-11
	Author Index	III_13
	Permuted Title Index	III-15
IV	Measurement and Monitoring Techniques	IV-1
	Keyword Index	IV-35
	Author Index	IV-41
	Permuted Title Index	IV-45
V	Environmental Behavior	V-1
	Keyword Index	V-43
	Author Index	V-51
	Permuted Title Index	V-55
VI	Biological Behavior	VI-1
	Keyword Index	VI-59
	Author Index	VI-69
	Permuted Title Index	VI-75
VII	Health Physics Aspects	VII-1
	Keyword Index	VII-59
	Author Index	VII-69
	Permuted Title Index	VII-73
VIII	Waste Management	VIII-1
	Keyword Index	VIII-29
	Author Index	VIII-35
	Permuted Title Index	VIII-37

		Page
IX	Results of Environmental Monitoring	IX-1
	Keyword Index	IX-39
	Author Index	IX-47
	Permuted Title Index	IX-49
X	Non-Compliance and Accident Reports	X-1
	Keyword Index	X-25
	Author Index	X-29
	Permuted Title Index	X-31
XI	Responses to Environmental Impact Questions	XI-1
	Keyword Index	XI-23
	Author Index	XI-27
	Permuted Title Index	XI-29

FOREWORD

The Health Physics Information System (HPIS) was established in January 1973 to respond to technical questions from persons within as well as outside the Health Physics Division of Oak Ridge National Laboratory and to assist research groups by developing bibliographic data files of reference material. Inquiries of a health physics nature may be directed to:

Health Physics Information System
Bldg. 4500 South, Room S-127
Oak Ridge National Laboratory
P. O. Box Y
Oak Ridge, Tennessee 37830

The documents which appear in this bibliography were retrieved from the Nuclear Safety Information Center (NSIC) data files. The NSIC was established in March 1963 at Oak Ridge National Laboratory to serve as a focal point for the collection, storage, evaluation, and dissemination of nuclear safety information. Inquiries concerning the capabilities and operations of NSIC may be directed to:

J. R. Buchanan, Assistant Director
Nuclear Safety Information Center
Oak Ridge National Laboratory
P. O. Box Y
Oak Ridge, Tennessee 37830

ACKNOWLEDGEMENTS

Ray L. Scott of the Nuclear Safety Information Center provided a search of the NSIC data files and advised in the preparation of this bibliography.

ABSTRACT

This bibliography contains 1291 documents which were retrieved from the Nuclear Safety Information Center (NSIC) data files using the keyword "tritium". For the purpose of this bibliography, the documents have been categorized as follows:

I	Sources and Projections
II	Operating Experience
III	Handling Procedures
IV	Measurement and Monitoring Techniques
V	Environmental Behavior
VI	Biological Behavior
VII	Health Physics Aspects
VIII	Waste Management
IX	Results of Environmental Monitoring
X	Non-Compliance and Accident Reports
XI	Responses to Environmental Impact Questions

Because of content, some of the documents appear in more than one category. Title, keywords, and abstract (when available) were used to categorize the documents.

Keyword, Author, and Permuted Title Indexes are provided for each category to simplify use of this document.

I Sources and Projections

I - SOURCES AND PROJECTION

002706
WHIPPLE, HG
NUCLEAR EXPLOSIONS, RADIOACTIVE ISOTOPES, RADIONUCLIDE LEVELS, UNITED STATES
UNIVERSITY OF MICHIGAN
PB-187251 +. 9 PAGES, 1969

THE LONG-TERM EQUILIBRIUM LEVELS OF TRITIUM, KRYPTON-85, AND CARBON-14 WHICH ARE ACCEPTABLE IN THE ENVIRONMENT HAVE BEEN ESTIMATED ON THE FOLLOWING PREMISES - (1) THE THREE ISOTOPES REACH THE ENVIRONMENT AND EQUILIBRATE THROUGHOUT IT IN PERIODS SHORTER THAN THEIR HALF LIVES, (2) NUCLEAR DETONATIONS AND NUCLEAR POWER CONSTITUTE THE DOMINANT SOURCES OF THESE ISOTOPES, (3) THE RADIATION DOSES FROM OTHER RADIOACTIVE ISOTOPES RELEASED TO ENVIRONMENT, AND (4) THE UNITED STATES, BY VIRTUE OF ITS POPULATION, IS ENTITLED TO 6 PERCENT OF THE WORLDS CAPACITY TO ACCEPT RADIOACTIVE WASTES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*CARBON + *KRYPTON + *NUCLEAR DETONATION + RADIATION SAFETY AND CONTROL + REACTOR POWER + *UNITED STATES + *ENERGY LEVEL + *EQUILIBRIUM

004683
BULLOCK JB + DANIELS F
PRELIMINARY DESIGN AND HAZARDS EVALUATION OF A D2O REFLECTOR TANK FOR THE FORD NUCLEAR REACTOR
UNIVERSITY OF MICHIGAN
25 PAGES, 6 FIGURES- JULY 1964, PHOENIX MEMORIAL LABORATORY MEMORANDUM REPORT NO. 6 (REVISED), DOCKET 50-2-PDR

THE REFLECTOR DESIGN HEREIN DESCRIBED APPEARS ALMOST CERTAIN TO IMPROVE PARTICULARLY THE REDUCTION OF THE FAST NEUTRON BACKGROUND. THE PORT ARRANGEMENT EFFECTIVELY REPRODUCES THE TANGENTIAL PORT DESIGN INCORPORATED IN THE BROOKHAVEN HFBR. AN ANTICIPATED REDUCTION OF 10 TO 20 IN THE FAST FLUX BACKGROUND ALONE WILL PERMIT EXTENDING THE ENERGY RANGE OF SPECTROMETER STUDIES WELL BEYOND PRESENT LIMITS AND WITH SHORTER DATA TAKING INTERVALS. IT WILL ALSO ALLOW INSPECTION OF SCATTERING CROSS-SECTIONS PRESENTLY TOO CLOSE TO THE NOISE LEVEL TO BE DETECTED. HEAT TRANSFER AND REACTIVITY CONSIDERATIONS ARE DISCUSSED AS IS TRITIUM PRODUCTION.

HEAT TRANSFER + REACTIVITY EFFECT + *REPORT, SAR + *REACTOR, TRAINING

005375
SELECTED POWER REACTOR PROJECTS IN CANADA AND THE UNITED STATES OF AMERICA
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
73 PAGES- NOVEMBER 1964, STI/DOC/10/36 (IAEA TECHNICAL REPORTS SERIES NO. 36)- IAEA

AS PART OF ITS ACTIVITIES IN CONNECTION WITH THE DEVELOPMENT OF NUCLEAR POWER, THE INTERNATIONAL ATOMIC ENERGY AGENCY HAS UNDERTAKEN A CONTINUING STUDY OF THE TECHNOLOGY AND ECONOMICS OF POWER REACTORS, WITH PARTICULAR REFERENCE TO THE NEEDS OF THE DEVELOPING COUNTRIES. INFORMATION ON THE PROGRESS MADE IN EIGHT POWER REACTOR PROJECTS, NAMELY THOSE OF BONUS, PATHFINDER, ELK RIVER, PIQUA, HALLAM, EXPERIMENTAL GAS-COOLED REACTOR (EGCR), HIGH-TEMPERATURE GAS-COOLED REACTOR (HTGCR) AND NUCLEAR POWER DEMONSTRATION (NPD), IS PRESENTED. DEVELOPMENTS DURING FY 63-64 ARE SHOWN, EMPHASIS BEING PLACED ON OPERATING EXPERIENCE IN THE CASE OF THOSE REACTORS WHICH HAVE BECOME CRITICAL.

BIG ROCK POINT (BWR) + REACTOR, BWR + CANADA + CONTAINMENT + CONTAINMENT, HIGH PRESSURE + CONTAINMENT, LOW PRESSURE + ECONOMICS + ELK RIVER (BWR) + FUEL HANDLING + REACTOR, GCR + HALLAM (LMR) + HYDRAULIC EFFECT + *IAEA + INSTRUMENT, NUCLEAR + REACTOR, LMCR + *REPORT, OPERATIONS + REACTOR, ORGANIC COOLED + PATHFINDER (ISR) + PEACH BOTTOM 1 (HTGR) + PIQUA (OCR) + PRESSURE VESSELS + REACTOR, PRESSURE TUBE + REACTIVITY EFFECT + TRAINING + URANIUM CARBIDE + VENTILATION SYSTEM + *OPERATING EXPERIENCE SUMMARY + CRITICALITY EXPERIMENT + REACTOR STARTUP TESTING + CONTROL ROD DRIVE MECHANISMS

007171
QUANTITIES OF TRITIUM IN RULISON GAS LESS THAN PREDICTED
U.S. ATOMIC ENERGY COMMISSION
AEC PRESS RELEASE N-170 +. 2 PAGES, SEPTEMBER 23, 1970

RECENTLY COMPLETED RADIOCHEMICAL ANALYSES OF NATURAL GAS SAMPLES TAKEN FROM THE PROJECT RULISON WELL INDICATE THAT APPROXIMATELY ONE-TENTH OF A GRAM OF TRITIUM IS PRESENT IN GASEOUS FORM IN THE CAVITY FORMED SOME 8,000 FEET UNDERGROUND BY THE 40 KILOTON NUCLEAR DETONATION NEAR GRAND VALLEY, COLORADO, IN SEPTEMBER, 1969.

AVAILABILITY - USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C. 20545

*PLOWSHARE + *NUCLEAR DETONATION + LRL + RADIOCHEMICAL ANALYSIS + *GAS + *CONCENTRATION + AGENCY, AEC

007399
GIBSON JA
THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
8 PAGES, 1 TABLE, 5 REFERENCES- JUNE 1963, AERE-M-1169- HMSO

THE RATE OF EVOLUTION OF TRITIUM FROM TRITIUM SOURCES ABSORBED ON TITANIUM WAS MEASURED WITH A

007399 *CONTINUED*
FLOW IONISATION CHAMBER TO ASSESS THE POSSIBLE HAZARD THAT MAY ARISE FROM THESE SOURCES. IT WAS FOUND THAT THE RATE OF TRITIUM EVOLUTION WAS LESS THAN 20 MICROCURIES PER 8 HOURS PER CURIE OF ABSORBED TRITIUM. IT SEEMS UNLIKELY THAT THE EVOLVED TRITIUM WOULD PRESENT AN INGESTION OR INHALATION HAZARD. THE BREMSSTRAHLUNG RADIATION WAS ALSO MEASURED AND WOULD BE A NEGLIGIBLE HAZARD UNDER NORMAL CIRCUMSTANCES. SOURCES USED AS TARGETS FOR PARTICLE ACCELERATORS MAY PRESENT INGESTION OR INHALATION HAZARDS DUE TO LOSS OF PARTICULATE MATERIAL IF THE SOURCES ARE STORED IN THE OPEN LABORATORY.

HAZARD, RELATIVE + *HAZARDS ANALYSIS + PERSONNEL EXPOSURE, RADIATION

009797
CHRISTENSEN J + OLESEN CB
PREDICTING PERFORMANCE OF D2O STEAM TURBINES IN BOILING HEAVY-WATER REACTORS
AB ATOMENERGI, STOCKHOLM, SWEDEN + STAL-LAVAL TURBINE CO., STOCKHOLM, SWEDEN
3 PAGES, 3 FIGURES, 6 REFERENCES, NUCLEONICS, 24(5), PP. 66-68 (MAY 1966)

ESTIMATES OF HEAVY-WATER LEAKAGE AND LIGHT-WATER CONTAMINATION WOULD INCREASE COST LESS THAN 0.1 MILL/KWHR, BASED ON TESTS AND EXPERIENCE IN MODERN TURBINES. RADIOLYTIC GAS RECOVERY WOULD REQUIRE A RECOMBINER. TRITIUM IN TURBINE WOULD REQUIRE STEAM-CLEARING BEFORE MAINTENANCE.

REACTOR, BWR + *ECONOMICS + REACTOR, HWR

010526
GOODE JH
THE RELEASE OF TRITIUM AND KRYPTON-85 TO THE ATMOSPHERE DURING PROCESSING OF THO2 - UO2 REACTOR FUEL
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE
2 PAGES, ANS TRANSACTION 9(1)- 21-22 (JUNE 1966), PRESENTED AT ANS ANNUAL MEETING, JUNE 20-23, 1966, DENVER, COLORADO

LABORATORY WORK - TWO SPECIMENS WERE CUT EIGHT TIMES TO SIMULATE PLANT OPERATION, THESE YIELDED 0.60 AND 0.75 CM3 OF GAS CONTAINING 3.43 AND 4.26 MCI OF KR-85 (0.83 AND 1.07% RELEASED), AND 2.98 AND 20.4 MICROCURIES OF TRITIUM, EQUIVALENT OF 0.04 AND 0.26 PERCENT OF THE THEORETICAL TOTAL. APPROXIMATELY 60 PERCENT OF THE TRITIUM RELEASED (UP TO 0.16 PERCENT OF THE TOTAL CALCULATED TO BE FORMED) WAS FREED BY THE FIRST CUT AND THE REMAINDER ON SUCCEEDING CUTS.

*FISSION GAS RELEASE + KRYPTON + THORIUM + URANIUM OXIDE + WASTE TREATMENT, GAS + EXPERIMENT + *FUEL REPROCESSING

010702
GOODE JH
HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3956 +. 19 PAGES, 3 FIGURES, 4 TABLES, 11 REFERENCES, JUNE 1966, CFSTI, $2.00 CY, $0.50 MN

HOT-CELL EXPERIMENTS WITH PROTOTYPE THO2-UO2 POWER REACTOR FUEL SPECIMENS IRRADIATED TO 24,600 MWD/METRIC TON (TH + U) SHOWED THAT UP TO 0.2 PERCENT OF THE FISSION-PRODUCED TRITIUM AND 1 PERCENT OF THE KR-85 WERE RELEASED WHEN THE FUEL WAS SHEARED INTO SHORT LENGTHS. IN OUR APPARATUS, ANOTHER 0.2 PERCENT OF THE TRITIUM AND THE BALANCE OF THE KRYPTON WERE RELEASED TO THE ATMOSPHERE WHEN THE FUEL WAS DISSOLVED TO MAKE SOLVENT EXTRACTION FEED. THIS QUANTITY OF TRITIUM IS LESS THAN 0.5 PERCENT OF THE ESTIMATED 1200 CURIES OF H-3 THAT MAY BE SAFELY DISCHARGED TO THE ATMOSPHERE FROM A 6-TON-PER-DAY PROCESSING PLANT.

*FISSION GAS RELEASE + KRYPTON + THORIUM + ATMOSPHERIC POLLUTION + *WASTE DISPOSAL, ATMOSPHERIC + URANIUM DIOXIDE + *RADIOCHEMICAL PLANT SAFETY + *FUEL REPROCESSING

010982
ARMY TESTS TRITIUM-ACTIVATED EXIT MARKERS ON PLANES (LUMINOSITY AND LEAKAGE)
U.S. ARMY AVIATION MATERIAL COMMAND, ST. LOUIS, MISSOURI
1 PAGE, LETTER - U.S. ARMY AVIATION MATERIAL COMMAND TO DIVISION OF COMPLIANCE (AEC) - MAY 17, 1968

THE AVCOM RADIOLOGICAL PROTECTION OFFICER (RPO) CONDUCTED A FIELD SURVEY OF ARMY AIRCRAFT EQUIPPED WITH EXIT MARKERS. HE TESTED FOR LUMINOSITY AND RADIATION LEAKAGE. RESULTS WILL BE SUBMITTED TO U. S. ARMY MATERIAL COMMAND AND YOUR OFFICE BY 15 JUL 68. THE U.S. ARMY ENVIRONMENTAL HYGIENE LAB AT EDGEWOOD ARSENAL, MARYLAND, WILL COMPLETE THE LEAKAGE TESTS OF THOSE MARKERS SAMPLED AT THE FIELD SURVEY BEFORE THE TARGET DATE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + *COMPLIANCE + *LEAK

011152
AEC UNCLASSIFIED PROGRAMS. QUARTERLY TECHNICAL PROGRESS REPORT, JANUARY - MARCH 1966
ATOMICS INTERNATIONAL
NAA-SR-11900 +. 170 PAGES, FIGURES, TABLES, JUNE 1966, CFSTI $5.00 CY, $1.00 MN

011152 *CONTINUED*
A PRELIMINARY STUDY OF TRITIUM IN A 2117 MW(TH) FAST BREEDER INDICATE THAT 9200 CURIES PER YEAR MAY BE PRODUCED AND MAY LEAK TO COOLANT. THIS WOULD PROBABLY BE MORE OF A NUISANCE THAN A HAZARD. HYDRAULIC TESTS ON THE FUEL ELEMENTS (UO2 CLAD IN SINTERED ALUMINUM POWDER) FOR THE PIQUA CORE II WERE FOUND IN ERROR BECAUSE THE FLOWMETER READ ABOUT 40 PERCENT LOW. VARIOUS TEMPERATURE AND FLOW CALCULATIONS ARE MADE.

*REACTOR, FAST + *HYDRAULIC EXPERIMENT + REACTOR, LMCR + REACTOR, ORGANIC COOLED + PIQUA (OCR) + *URANIUM DIOXIDE

011481
ROTHWELL E + WASSELL LL
PRELIMINARY OBSERVATIONS OF THE RELEASE OF TRITIUM FROM IRRADIATED BERYLLIA
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL, ENGLAND
AERE-R-4691 +. 12 PAGES, 3 FIGURES, DECEMBER 1964, UKAEA

POSTIRRADIATION ANNEALING EXPERIMENTS ARE REPORTED FOR NEUTRON-IRRADIATED BERYLLIA COMPACTS AND FOR POWDER OBTAINED FROM AN IRRADIATED COMPACT. RELEASE RATES WERE MEASURED IN THE TEMPERATURE RANGE 200 TO 1650 C. AN INITIAL BURST OF TRITIUM WAS OBSERVED ON ATTAINING TEMPERATURE IN EACH CASE, AND PROLONGED ANNEALING WAS NECESSARY AT MOST TEMPERATURES BEFORE TRUE BULK DIFFUSION RELEASE CONDITIONS WERE ESTABLISHED.

ACTIVATION + *BERYLLIUM + *DIFFUSION COEFFICIENT

011521
HANDLEY TP
RELEASE OF TRITIUM FROM TRITIUM-LABELED LUMINOUS PAINTS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-1478 +. 11 PAGES, 3 FIGURES, 6 TABLES, JUNE 1966, CFSTI $1.00 CY, $0.50 MN

SAMPLES OF COMMERCIAL TRITIATED ORGANIC POLYMERS USED IN LUMINOUS PAINTS WERE TESTED FOR RELEASE OF TRITIUM. DURING THE DRYING PERIOD AFTER APPLICATION, TRITIUM RELEASE DECREASED ONLY SLIGHTLY WITH TIME. LOSS OF TRITIUM BY THE DRIED PAINT WAS ROUGHLY EXPONENTIAL WITH RESPECT TO TEMPERATURE FOR CERTAIN PAINTS, AND FOR OTHERS A STEPWISE CHANGE WAS NOTED. THE TRITIUM WAS RELEASED CHIEFLY AS TRITIATED WATER.

*THERMAL CONSIDERATION + COATING + RADIOACTIVITY RELEASE

012417
BARNABY F
IS NUCLEAR POWER WORTH THE RISKS
6 PAGES, SCIENCE JOURNAL, 6(8), PP. 40-45 (AUGUST 1970)

AUTHOR IS CONVINCED NUCLEAR TECHNOLOGY IS IMMINENT. PROBLEM IS THAT RAPID SPREAD TO MANY COUNTRIES POSES POTENTIAL HAZARDS FOR MANKIND. SO FAR THIS THREAT HAS NOT REACHED STAGE WHERE WORLD POPULACE IS ENDANGERED. THUS, SO FAR, NO MAJOR ACCIDENT ONLY BECAUSE COUNTRIES WITH ADVANCED N-TECHNOLOGY ARE THOSE WITH LONG HISTORIES OF INDUSTRIAL AND TECHNOLOGICAL EXPERIENCE. BUT THE TECHNOLOGY IS SPREADING INTO COUNTRIES WHICH DO NOT HAVE THIS BACKGROUND. HE DISCUSSES ALL RAMIFICATIONS OF THE TECHNOLOGY, ESP. NUCLIDE RELEASES FROM ORE REFINERY TO WASTE MANAGEMENT ROUTE. JUST ONE EXAMPLE IS THAT FISSION PRODUCTS PRODUCED IN 1 YR IN JUST 1 POWER REACTOR WILL CONTAIN SUFFICIENT SR-90 TO PROVIDE MAX. DOSE FOR WORLDS POPULATION SEVERAL TIMES OVER. SURVEILLANCE TIME TO DECAY TO MPC IS ABOUT 1500 YR. IT IS DIFFICULT TO BE CONFIDENT THERE ARE MANY NATIONS IN WHICH SUCH WILL BE CARRIED OUT RESPONSIBILITY FOR THIS LENGTH OF TIME.

ECONOMICS + FISSION PRODUCT RELEASE + INSURANCE + KRYPTON + INCIDENT, CONSEQUENCE + INCIDENT COMPILATION + STRONTIUM + UNITED KINGDOM + *REACTOR, POWER + POPULATION EXPOSURE + WASTE MANAGEMENT + ICRP + RADIOACTIVITY RELEASE + EXCAVATION, NUCLEAR + *SURVEILLANCE PROGRAM + INTERNATIONAL + DATA COLLECTION + RADIATION EFFECT + BENEFIT VS RISK + LEGISLATION + N-POWER, SAFETY OF + NUCLEAR DEVICE AND EQUIPMENT + *SOCIO/PHILOSOPHICAL CONSIDERATION + N-POWER FORECAST

013067
MISKEL JA
PRODUCTION OF TRITIUM BY NUCLEAR WEAPONS
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-73270 +. 12 PAGES, JUNE 30, 1971

TRITIUM IN THE ATMOSPHERE TOTALS ABOUT 4500 MEGACURIES, ABOUT 45 TIMES THE COMPONENT FROM NATURAL PROCESSES. IN THE ABSENCE OF FURTHER ATMOSPHERIC TESTING OF THERMONUCLEAR WEAPONS, RETURN TO WITHIN 10% OF THE NATURAL LEVEL WILL REQUIRE ABOUT 100 YEARS. UNDERGROUND TESTING OF THERMONUCLEAR WEAPONS DOES NOT CONTRIBUTE SIGNIFICANTLY, COMPARED WITH NATURAL PROCESSES. ABOUT 99% OF THE TRITIUM FROM UNDERGROUND TESTS IS TRAPPED AS TRITIATED WATER IN THE GROUND. OF THE REMAINDER PRESENT AS HT, ONLY A SMALL FRACTION IS RELEASED TO THE ATMOSPHERE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*CONTAINMENT, UNDERGROUND + FALLOUT + RAINOUT + TRACER, RADIOACTIVE + *ATMOSPHERIC POLLUTION + ATMOSPHERIC CHEMISTRY + CRITICAL NUCLIDE PATHWAY + RESPONSE TIME + NUCLEAR EXPLOSION DEBRIS + *RADIONUCLIDE TRANSFER

013202
CARVER KB
TRITIUM HAZARDS ASSOCIATED WITH NEUTRON GENERATORS. TECHNICAL BULLETIN NO. 105
KAMAN NUCLEAR, COLORADO SPRINGS
NP-15632 +. 7 PAGES, NOVEMBER 1964, CFSTI

A POTENTIAL TRITIUM HAZARD EXISTS IN HIGH OUTPUT NEUTRON GENERATORS USING A DEUTERIUM-TRITIUM REACTION. TARGET REPLENISHING AND STRATEGICALLY PLACED ISOLATION VALVES, AS PROVIDED IN THE KAMAN NUCLEAR DRIFT TUBE NEUTRON GENERATOR SERIES A-900 AND A-1000, WERE FOUND TO GREATLY REDUCE THE REQUIREMENT FOR OPENING THE SYSTEM. THEREFORE, THE TRITIUM HAZARD IS SIGNIFICANTLY LESSENED.

*HAZARDS ANALYSIS + NEUTRON + ACCELERATOR

013282
THATCHER LL + PAYNE BR + CAMERON JF
TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
CONF-765 +. 29 PAGES, 13 FIGURES, 8 TABLES, 9 REFERENCES, PAGES 646-674 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI $6.50 CY.

TRITIUM LEVELS ROSE FROM AN AVERAGE BASE OF 80 TRITIUM UNITS (T.U.) FOR CONTINENTAL SITES IN THE NORTHERN HEMISPHERE TO AVERAGE PEAKS OF 2000 T.U. IN 1962 AND 4000 TO 5000 IN 1963. INDIVIDUAL PEAKS WERE HIGHER, REACHING 10,000 IN NORTHERN CANADA. LEVELS IN PRECIPITATION WERE LOWER IN 1964. THE PEAK YEAR APPEARS TO HAVE BEEN 1963. THE RATE OF DECREASE FROM 1963 TO 1964 IS LESS THAN THE COMPARABLE PERIOD 1959 TO 1961, POSSIBLY REFLECTING THE HIGHER ALTITUDES INVOLVED IN THE LAST TESTING. TRITIUM AND SR-90 DEPOSITION VALUES OVER THE GLOBE SHOW INTERESTING CONSISTENCIES THAT MAY PERMIT THE ESTIMATION OF TRITIUM CONCENTRATION FOR UNSAMPLED AREAS. THE HTO/SR-90 RATIO INCREASES TOWARD THE HIGH MID-LATITUDES IN THE NORTHERN HEMISPHERE. THE SOUTHERN-HEMISPHERE PRECIPITATION AVERAGED ONLY 15 T.U. IN 1963 COMPARED TO SEVERAL THOUSAND TRITIUM UNITS FOR THE NORTHERN HEMISPHERE. IT IS ESTIMATED THAT IN 1962 AND 1963 THE DEPOSITION OF TRITIUM HAD BEEN APPROXIMATELY 44 OR 96 KG, DEPENDING ON WHETHER OR NOT OCEANIC EXCHANGE WAS INCLUDED IN THE CALCULATION. THIS WOULD LEAVE EITHER 124 OR 72 KG IN THE STRATOSPHERE BASED ON THE ASSUMPTION OF A 168-KG PRODUCTION IN 1961 AND 1962.

ATMOSPHERIC CIRCULATION, GLOBAL + FALLOUT + RAINOUT + STRATOSPHERE + STRONTIUM

013440
AEC EXEMPTS THE USE OF TRITIUM IN CERTAIN PRODUCTS
UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
PRESS REL. J-81 +. 1 PAGE, APRIL 1, 1966

THE ATOMIC ENERGY COMMISSION IS AMENDING ITS REGULATIONS TO EXEMPT FROM LICENSING THE POSSESSION AND USE OF TRITIUM CONTAINED IN A NUMBER OF CONSUMER PRODUCTS. THE AMENDMENTS TO COMMISSION REGULATIONS PART 30 AND PART 32 EXEMPT THE USE OF TRITIUM CONTAINED IN LUMINOUS THERMOSTAT DIALS AND POINTERS, AUTOMOBILE SHIFT QUADRANTS, AND MARINE COMPASSES. THE MANUFACTURE OR IMPORT OF THESE ITEMS WILL REQUIRE A LICENSE FROM THE AEC, AS IS THE CASE WITH TIMEPIECES, AUTOMOBILE LOCK ILLUMINATORS, AND PRECISION BALANCES.

014384
POLLOCK BD + KUNKEL WP + MURBACH EW
NUCLEAR SAFETY, CHEMICAL REACTIONS. FISSION PRODUCT AND CONTAMINATION CONTROL
ATOMICS INTERNATIONAL
NAA-SR-12175 +. 8 PAGES, 5 FIGURES, 6 REFERENCES, QUARTERLY TECHNICAL PROGRESS REPORT AEC UNCLASSIFIED PROGRAMS, JULY-SEPTEMBER 1966, PAGES 153-160

THE OBJECTIVE OF THIS PROGRAM IS TO ELUCIDATE THE BEHAVIOR OF FISSION PRODUCTS RELEASED TO THE COOLANT IN A FAST SODIUM-COOLED LMFBR REACTOR DURING NORMAL OPERATION, IN ORDER TO PROVIDE INFORMATION NECESSARY FOR THE DEVELOPMENT OF FISSION PRODUCT TRAPPING TECHNIQUES IN SUCH SYSTEMS. THE DISPOSITION OF FISSION PRODUCTS DURING NORMAL OPERATION MUST BE ALSO KNOWN IN ORDER TO ASSESS THE CONSEQUENCES OF POTENTIAL ACCIDENTS. INFORMATION IS REQUIRED ON THE EXTENT OF FISSION PRODUCT RETENTION IN SODIUM COOLANT, THE RATE AND EXTENT OF RELEASE TO THE COVER GAS, AND THE RATE AND EXTENT OF PLATE-OUT ON SURFACES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, $3.00 COPY, $0.65 MICRONEGATIVE

*CESIUM + IODINE + KRYPTON + *REACTOR, LMCR + NOBLE GAS + *SODIUM + TRACER, RADIOACTIVE + *XENON + FISSION PRODUCT TRANSPORT + *OUT OF PILE EXPERIMENT + FILTER, TRAP + *METAL, LIQUID + GAMMA EMITTER

014463
AEC EXEMPTS USE OF TRITIUM IN MARINE NAVIGATIONAL INSTRUMENTS
UNITED STATES ATOMIC ENERGY COMMISSION
PRESS REL. K-13 +. 1 PAGE, JANUARY 23, 1967

014463 *CONTINUED*

THE ATOMIC ENERGY COMMISSION IS AMENDING ITS REGULATIONS TO EXEMPT FROM LICENSING THE POSSESSION AND USE OF TRITIUM TO PROVIDE ILLUMINATION IN MARINE NAVIGATIONAL INSTRUMENTS. THE COMMISSION RECENTLY APPROVED A SIMILAR USE OF UP TO 750 MILLICURIES OF TRITIUM IN MARINE COMPASSES. UNDER THE PRESENT AMENDMENT, NO OTHER MARINE NAVIGATIONAL INSTRUMENT WOULD CONTAIN MORE THAN 250 MILLICURIES OF TRITIUM GAS, AND THE TRITIUM IN MARINE COMPASSES WOULD HAVE TO BE IN THE FORM OF GAS.

AVAILABILITY - AEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C. 20545

*REGULATION, AEC + INSTRUMENTS, MISC.

014734
RAY JW + WOOTON RO + BARNES RH
INVESTIGATION OF TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS
BATTELLE MEMORIAL INSTITUTE
BMI-1787 +. 121 PAGES, OCTOBER 31, 1966

THE TERNARY FISSION PROCESS IS THE MAJOR SOURCE OF TRITIUM, FOLLOWING USE OF LITHIUM-BASED RESIN IN 1963 GENERATED AT THE RATE OF 8.7 X 10 TO THE 5TH TRITONS PER FISSION. THE RESULTANT TRITIUM DIFFUSES THROUGH THE CLAD. WATER SAMPLES WERE ASSAYED, AND A MATHEMATICAL MODEL DESCRIBING TRITIUM GENERATION AND MOVEMENT THROUGHOUT PM PLANTS WAS DEVELOPED. THE RESULTING PROGRAM, TRICON, WAS EMPLOYED TO CALCULATE TRITIUM CONCENTRATIONS AT PM-3A DURING 1965. AGREEMENT BETWEEN CALCULATED AND MEASURED CONCENTRATIONS WAS GOOD. POTENTIAL HEALTH HAZARDS FROM BOTH AIRBORNE AND WATERBORNE TRITIUM WERE CALCULATED. THE MOST ECONOMICAL SOLUTION AT PM-1 APPEARS TO BE THE REMOVAL OF TRITIATED EFFLUENT FROM THE PLANT SITE AT $1.40 PER GALLON, AND AT PM-3A TO BE THE EXPELLING OF TRITIATED EFFLUENT WATER TO AN ISOLATED AREA WHERE IT WILL FREEZE AND SUBLIME IN SAFE CONCENTRATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, $3.00 COPY, $0.65 MICRONEGATIVE

COMPUTER PROGRAM + COMPUTER, DIGITAL + REACTOR, PWR + *WASTE DISPOSAL, LIQUID + HAZARDS ANALYSIS + PM 1 (PWR) + PM 3A (PWR) + *MAIN COOLING SYSTEM + REACTOR, MILITARY

015305
THOMPSON TJ
DRL EXEMPTS MIT FROM 10CFR20 TO ALLOW TRITIUM DISCHARGE
MASS. INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(13), PAGE 25, (MARCH 27, 1967)

AEC EXEMPTS MIT REACTOR FROM 10 CFR 20.203(D) TO ALLOW DISCHARGE OF 20,000 GAL OF SECONDARY COOLANT CONTAMINATED WITH 12 CURIES OF TRITIUM. THE LIQUID WILL BE DISCHARGED TO SANITARY SEWER (AND CHARLES RIVER) SUCH THAT IT WILL BE REDUCED TO LESS THAN THE MPC.

*EFFLUENT + REACTOR, HWR + REACTOR, RESEARCH + *WASTE DISPOSAL, RIVER

015896
AEC EXEMPTS USE OF TRITIUM IN GLOW LAMPS
ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
USAEC PRESS RELEASE J-254 +. 1 PAGE, NOVEMBER 8, 1966

THE ATOMIC ENERGY COMMISSION AMENDED PARTS 30 AND 32 OF ITS REGULATIONS TO PROVIDE LICENSE EXEMPTION FOR THE POSESSION AND USE OF UP TO 10 MICROCURIES OF TRITIUM CONTAINED IN GLOW LAMPS. TRITIUM MAKES GLOW LAMPS START MORE QUICKLY WHEN THE LAMPS ARE USED IN AREAS OF REDUCED LIGHT OR DARKNESS. SUCH LAMPS ARE USED IN A WIDE VARIETY OF ITEMS RANGING FROM GENERAL APPLIANCES TO COMPLICATED ELECTRONIC CIRCUITS. THE MANUFACTURE OR IMPORT OF THE GLOW LAMPS CONTAINING TRITIUM STILL WILL REQUIRE A LICENSE FROM THE AEC.

AVAILABILITY- USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C., 20545

*REGULATION, AEC + AGENCY, AEC

016916
COWSER KE + KAYE SV + ROHWER PS + SNYDER WS + STRUXNESS EG
DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I
OAK RIDGE NATIONAL LABORATORY, HEALTH PHYSICS DIVISION, TENN.
ORNL-4101 +. 210 PAGES, 13 FIGURES, 11 TABLES, 3 REFERENCES, MARCH 1967

THIS REPORT PRESENTS INFORMATION OBTAINED BY ORNL IN PHASE I OF DOSE-ESTIMATION STUDIES TO EVALUATE THE RADIOLOGICAL-SAFETY FEASIBILITY OF EXCAVATING AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. THE INFORMATION INCLUDES (1) METHODS FOR ESTIMATING EXTERNAL AND INTERNAL DOSE EQUIVALENTS, FOR QUANTIFYING THE TRANSFER OF RADIONUCLIDES THROUGH CRITICAL EXPOSURE PATHWAYS, AND FOR IDENTIFYING THE RADIONUCLIDES LIKELY TO BE CRITICAL, (2) CRITERIA FOR EVALUATING THE RADIOLOGICAL SAFETY OF THE OPERATION, AND (3) LISTS OF RADIONUCLIDES ARRANGED ACCORDING TO THE DOSE COMMITMENT THAT RESULTS FROM EXPOSURE TO A UNIT QUANTITY OF EACH RADIONUCLIDE.

016916 *CONTINUED*
AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

ECOLOGY + *DOSE + EQUATION + FALLOUT + FRC + INGESTION + INHALATION + IODINE + SURFACE WATER, NUCLIDE OCCURRENCE + DOSE CALCULATION, INTERNAL + MONITOR, ENVIRONMENTAL + NUCLEAR DETONATION + SOIL, NUCLIDE OCCURRENCE + DOSE CALCULATION, EXTERNAL + *NUCLEAR EXPLOSION DEBRIS + PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + MATHEMATICAL TREATMENT + CONCENTRATION + MAN

020575
RAY JW
GENERATION AND RELEASE OF TRITIUM IN PM-TYPE NUCLEAR POWER PLANTS
BATTELLE MEMORIAL INSTITUTE
CONF-670602 +. 2 PAGES, 6 REFERENCES, ANS TRANSACTIONS 10(1) PAGES 324 AND 325 (JUNE 1967), PRESENTED AT THE 1967 ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, SAN DIEGO, CALIFORNIA, JUNE 11-15, 1967

BATTELLE-COLUMBUS INVESTIGATED SOURCES AND MIGRATION MECHANISMS FOR TRITIUM IN PM-TYPE REACTORS. CALCULATIONS SHOWED THAT THE SIGNIFICANT SOURCES WERE TERNARY FISSION AND NEUTRON REACTIONS IN BORON BURNABLE POISON, WITH TERNARY FISSION CONTRIBUTING 90% OF THE TOTAL.

BORON + *FISSION PRODUCT RELEASE + FISSION PRODUCT, VOLATILE + REACTOR, PWR + PM 1 (PWR) + PM 2A (PWR) + PM 3A (PWR) + NEUTRON + REACTOR, MILITARY

023290
COWSER KE + TADMOR J + JACOBS DG + BOEGLY WJ
EVALUATION OF ENVIRONMENTAL HAZARDS FROM RELEASE OF KR-85 AND H-3 IN AN EXPANDING NUCLEAR FUEL REPROCESSING INDUSTRY
HEALTH PHYSICS DIVISION, OAK RIDGE NATIONAL LAB., TENN.
1 PAGE, ABSTRACT IN HEALTH PHYSICS 13, PAGE 943, (1967), PAPER PRESENTED AT THE TWELFTH ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY, WASHINGTON, D. C., JUNE 18-22, 1967

PRESENT STUDIES ARE CONCERNED WITH ESTIMATES OF THE DOSE EQUIVALENTS TO MAN THAT MAY RESULT FROM THE COMPLETE RELEASE OF KR-85 AND H-3 DURING REPROCESSING OF SPENT REACTOR FUEL. BASED ON ESTIMATES OF THE FREE-WORLD NUCLEAR POWER GROWTH, THE WORLDWIDE DISTRIBUTION OF THESE RADIONUCLIDES IN YEAR 2000 MAY RESULT IN A TOTAL BODY DOSE RATE OF 1.8 MREM/YR FROM KR-85 AND A BODY TISSUE DOSE RATE OF 0.0021 MREM/YR FROM H-3. RISK TO THE WORLDS POPULATION IS EVALUATED IN TERMS OF POTENTIAL EFFECT.

KRYPTON + RELEASE RATE + WASTE TREATMENT, GAS + *DOSE CALCULATION, INTERNAL + ORNL + *WASTE DISPOSAL, GAS + *DOSE CALCULATION, EXTERNAL + *ENVIRONMENT + FUEL REPROCESSING

025055
PARKER FL
RADIOACTIVE WASTES FROM FISSION REACTORS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENN.
2 PAGES, REFERENCES, SCIENCE, 159(3810), PAGES 83-84 (JAN. 5, 1968)

CALCULATION OF THE AMOUNT OF TRITIUM RELEASED FROM A HYPOTHETICAL FUSION REACTOR SHOWS THAT IT IS 20,000 TIMES THE AMOUNT RELEASED BY GENERATION OF AN EQUIVALENT AMOUNT OF ELECTRICITY BY A FISSION REACTOR. RELEASE OF THE TRITIUM GENERATED BY A POWER ECONOMY, IF THE NUCLEAR POWER WERE ALL FUSION, WOULD RESULT IN UNACCEPTABLE WORLDWIDE DOSAGES BY THE YEAR 2000.

*FISSION PRODUCT RELEASE + *REACTOR, POWER + NEUTRON

025598
MACHTA L
INVENTORIES OF SELECTED LONG-LIVED RADIOISOTOPES PRODUCED DURING WEAPON TESTING
U.S. WEATHER BUREAU
12 PAGES, 5 FIGURES, 5 TABLES, REFERENCES, PAGES 43-54, FROM COLLOQUE INTERNATIONAL SUR LA POLLUTION RADIOACTIVE DES MILIEUX GAZEUS (RADIOACTIVE POLLUTION OF GASEOUS MEDIA). BOOK I. SACLAY, NOVEMBER 12-16, 1963

THE OBSERVED ATMOSPHERIC DISTRIBUTIONS OF INVENTORIES OF STRONTIUM-90 AND CARBON-14 ARE REVIEWED AS A FUNCTION OF TIME. THE DEPOSITED GLOBAL STRONTIUM-90 AND ESTIMATED ATMOSPHERIC CONTENT ABOVE SAMPLING ALTITUDE ADDED TO THE ABOVE INVENTORIES ARE COMPARED WITH THE STRONTIUM-90 PRODUCTION BASED ON THE FISSION YIELDS ANNOUNCED BY THE U.S. ATOMIC ENERGY COMMISSION. PREDICTIONS OF THE FUTURE DISTRIBUTIONS OF STRONTIUM-90 AND CARBON-14 ARE GIVEN. BASED ON THE CESIUM-137/STRONTIUM-90 THEORETICAL AND OBSERVED RATIOS, ONE MAY CONVERT STRONTIUM-90 INVENTORIES AND PREDICTIONS TO THOSE FOR CESIUM-137. SIMILAR, BUT LESS CONVINCING REMARKS, APPLY TO TRITIUM-TO-CARBON-14 RATIOS IN ORDER TO CALCULATE TRITIUM INVENTORIES.

AVAILABILITY - PRESSES UNIVERSITAIRES DE FRANCE, 108, BOULEVARD SAINT-GERMAIN, PARIS VI, FRANCE

CARBON + CESIUM + *ATMOSPHERIC DIFFUSION, GLOBAL + *FALLOUT + *SAMPLING, HIGH ALTITUDE + STRATOSPHERE + COMPARISON, THEORY AND EXPERIENCE + STRONTIUM + NUCLEAR DETONATION + MONITORING PROGRAM, ENVIRONMENTAL

027527
SAFETY INVOLVING DETONATION OF NUCLEAR DEVICES
REYNOLDS ELECTRICAL AND ENGINEERING COMPANY, INC.
NVO-28 +. 141 PAGES, MAY 1966

THE CONTENT OF THIS PUBLICATION IS PRIMARILY DIRECTED TO DESCRIBING THE LONG-RANGE SAFETY STUDIES NECESSARY TO IMPROVE PREDICTION CAPABILITIES AND KEEP PACE WITH AN ACTIVE TESTING PROGRAM. THE DAY-TO-DAY DETONATION SAFETY ACTIVITIES NECESSARY TO SUPPORT THE TESTING PROGRAM ARE DESCRIBED TO THE EXTENT REQUIRED TO GIVE AN OVERALL, THOUGH LIMITED, VERSION OF EVENT-RELATED SAFETY ACTIONS AND PROCEDURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $4.00 COPY, $1.00 MICROFICHE

DIFFUSION + FALLOUT + *GROUND WATER + SEISMOLOGY + *SURFACE WATER + *NUCLEAR DETONATION + TRACER + CONTAMINATION + *HYDROLOGY + *RADIATION SAFETY AND CONTROL + WATER POLLUTION + TRANSPORT PROPERTY + AGENCY, AEC

027648
NELLIS DO + HUDSPETH EL + MORGAN IL + BUCHANAN PS + BOGGS RF
TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION
U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE, PUBLIC HEALTH SERVICE
PHS-PUBL. 999-RH-29 +. 47 PAGES, 15 FIGURES, 5 TABLES, 8 REFERENCES, NOVEMBER 1967

TRITIUM-METALLIC TARGETS ARE FREQUENTLY USED IN MANY PARTICLE ACCELERATORS FOR THE PRODUCTION OF HIGH-ENERGY NEUTRONS. THE PURPOSE OF THIS STUDY WAS TO INVESTIGATE THE PROBLEMS AND HAZARDS ASSOCIATED WITH THE USE OF THESE TRITIUM TARGETS SO THAT APPROPRIATE STEPS CAN BE TAKEN TO MINIMIZE THE POTENTIAL RADIOLOGICAL HEALTH HAZARDS. THIS STUDY SHOWED THAT BOMBARDMENT OF TRITIUM TARGETS RESULTS IN THE LOSS OF ABOUT 1 TRITIUM ATOM FOR EACH BOMBARDING DEUTERON, AND THAT MOST OF THE TRITIUM IS IN A GASEOUS FORM WHEN IT LEAVES THE TARGET. IT WAS ALSO DETERMINED THAT A RELATIVELY SMALL AMOUNT OF THE TRITIUM RELEASED FROM THE TARGET ACTUALLY REMAINS WITHIN THE ACCELERATOR ITSELF. MOST OF THE TRITIUM LOST BY A BOMBARDED TARGET IS TRAPPED IN THE ELEMENTS OF AN ION PUMP OR RELEASED THROUGH THE VACUUM SYSTEM EXHAUST.

AVAILABILITY - PUBLIC HEALTH SERVICE, WASHINGTON, D.C., FREE

*MONITOR, GAS + *CONTAMINATION + ACCELERATOR

027977
COOLEY RC
CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS
SAVANNAH RIVER LABORATORY
DPSPU-66-30-13 + CONF-680607-1 +. 15 PAGES, TABLES, MAY 1968, FROM 13TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO

IN HEAVY-WATER-MODERATED REACTORS, TRITIUM IS FORMED AS NEUTRONS ARE ABSORBED BY THE HEAVY WATER. HAZARDS FROM TRITIUM RELEASED TO PERSONNEL ZONES DURING REPAIR AND MAINTENANCE OPERATIONS ARE MINIMIZED BY PROPER JOB EVALUATION AND SELECTION OF CORRECT PROTECTIVE EQUIPMENT. AT SAVANNAH RIVER PLANT, BASIC INFORMATION HAS BEEN DEVELOPED TO FACILITATE THIS PROCESS. DATA IS GIVEN RELATIVE TO BUILDUP OF TRITIUM IN MODERATOR, AIRBORNE CONCENTRATION OF TRITIUM, CONCENTRATION OF TRITIUM IN SPILLED MODERATOR AND WATER, ASSIMILATION OF TRITIUM BY PERSONNEL THROUGH INHALATION AND BODY CONTACT, AND DOSE RECEIVED BY URINE ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*REACTOR, HWR + INHALATION + *ANALYTICAL TECHNIQUE + HAZARDS ANALYSIS + RADIATION SAFETY AND CONTROL + SORPTION + *MONITORING SYSTEM, RADIATION + CONCENTRATION + EXCRETION, URINE + MAN

030129
JACOBS DG
SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
TID-24635 + ORNL-NSIC-39 +. 90P., DEC. 1968

AN ATTEMPT IS MADE IN THIS STATE-OF-THE-ART-REPORT TO SUMMARIZE SOME OF THE IMPORTANT PROPERTIES OF TRITIUM AND TO USE THESE PROPERTIES IN PREDICTING THE IMPACT OF DIVERSE RELEASES OF TRITIUM ON LOCAL AND WORLDWIDE POPULATIONS. DESPITE INADEQUACIES OF PRESENT INFORMATION ON THE BEHAVIOR OF TRITIUM, WE CAN CONCLUDE, IN OUR PRESENT POWER ECONOMY, TRITIUM POSES NO SEVERE WORLDWIDE EXPOSURE PROBLEMS. HOWEVER, IT WILL CONTINUE TO OFFER HANDLING AND ENVIRONMENTAL CONTAMINATION PROBLEMS. ALSO REPORTED IS INFORMATION CONCERNING SOURCES, ENRICHMENT, MONITORING, MOVEMENT, AND PROJECTED PRODUCTION OF TRITIUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

DEPOSITION + DIFFUSION + DILUTION + CHROMATOGRAPHY + GROUND WATER + OCEAN AND SEA + RAINOUT + STRATOSPHERE + SURFACE CONTAMINATION + CONDENSATION + REACTOR, POWER + THERMAL CONSIDERATION + POPULATION EXPOSURE + EVAPORATION + HYDROLOGY + RADIATION SAFETY AND CONTROL + DISPERSION + RADIOACTIVITY RELEASE + ENVIRONMENT + TROPOSPHERE + FUEL REPROCESSING + RADIATION MONITORS + JACOBS

030457
HAINES A + MUSGRAVE BC
TRITIUM CONTENT OF ATMOSPHERIC METHANE AND ETHANE
UNIVERSITY OF ARKANSAS, FAYETTEVILLE
7 PAGES, J. GEOPHYS. RES., 73, PAGES 1167-73 (FEB. 15, 1968)

SAMPLES OF LIQUID OXYGEN COLLECTED AT GROUND LEVEL NEAR NEOSHO, MISSOURI, HAVE BEEN PROCESSED FOR RECOVERY OF METHANE, AND THE TRITIUM CONTENT OF THESE SAMPLES IS DISCUSSED IN TERMS OF POSSIBLE SOURCES OF THIS RADIOACTIVITY. THE CONTINUING RELEASE OF LABELED METHANE BY NUCLEAR INDUSTRY IS SUGGESTED BY THE FACT THAT THE T/H RATIO HAS NOT CHANGED APPRECIABLY DURING THE PERIOD 1958 TO 1966, ALTHOUGH THIS INTERVAL IS COMPARABLE TO THE CHEMICAL LIFETIME EXPECTED FOR METHANE IN THE ATMOSPHERE.

*AIRBORNE RELEASE + *ATMOSPHERIC DIFFUSION, CLIMATOLOGY + *ATMOSPHERIC POLLUTION

030475
BEGEMANN F + FRIEDMAN I
TRITIUM AND DEUTERIUM IN ATMOSPHERIC METHANE
MAX-PLANCK INSTITUT FUER CHEMIE, MAINZ
5 PAGES, J. GEOPHYS. RES., 73, PAGES 1149-53 (FEB. 15, 1968)

TEN SAMPLES OF ATMOSPHERIC METHANE COLLECTED AT OBERHAUSEN GERMANY, AND GARY, INDIANA, BETWEEN 1960 AND 1963 WERE ANALYZED FOR THEIR TRITIUM AND DEUTERIUM CONTENT. RESULTS SHOW THE TRITIUM CONCENTRATION IN THE NORTHERN HEMISPHERE TO HAVE BEEN ESSENTIALLY CONSTANT SINCE 1958, THE TIME THE FIRST SAMPLES WERE ANALYZED. EXISTING THEORIES TO EXPLAIN THE ORIGIN OF TRITIATED METHANE ARE DISCUSSED AND REJECTED AS HIGHLY IMPROBABLE. THE DATA CAN BEST BE EXPLAINED BY ASSUMING THAT LEAKAGE OF TRITIATED METHANE INTO THE ATMOSPHERE FROM SOURCES IN NUCLEAR INDUSTRY LOCATED IN THE NORTHERN HEMISPHERE OCCURRED FOR A PERIOD OF YEARS PRIOR TO 1958, AND THEN THE LEAK WAS ESSENTIALLY CLOSED.

*AIRBORNE RELEASE + *ATMOSPHERIC DIFFUSION, CLIMATOLOGY + *DEUTERIUM + *ATMOSPHERIC POLLUTION + GERMANY

030487
TRITIUM IN BWR, PRESSURE VESSEL DESIGN CRITERIA, AND REVISED PAGES
GEORGIA POWER CO.
50321-5 +. 150 PAGES, FIGURES, TABLES, AMEND. 1 TO E. I. HATCH 1 LICENSE APPLICATION, AUG. 9, 1968, DOCKET 50-321

CONSISTS OF (1) REPLACEMENT PAGES, (2) ADDITIONAL INFORMATION ON THE PRESSURE VESSEL DESIGN CRITERIA, AND (3) TECHNICAL NOTES ON THE SIGNIFICANCE OF TRITIUM IN WATER REACTORS. DISCUSSION OF TRITIUM INCLUDES PROPERTIES, RADIATION PROTECTION, METHODS OF FORMATION, SIGNIFICANCE IN REACTORS, EXPERIENCE IN BWRS - SUPERHEAT REACTORS - GE TEST REACTOR AND BWR REFUELING, SIGNIFICANCE IN WASTE DISPOSAL BOTH LIQUID AND AIRBORNE, AND CONTROL OF T IN THE INITIAL BWR CORE. A 1968 ANALYSIS OF KRB REACTOR WATER WITH TEMPORARY BORON CONTROL CURTAINS (FOR EXCESS REACTIVITY IN FIRST CORE) INDICATES THE CURTAINS DO NOT CONTRIBUTE SIGNIFICANTLY TO TRITIUM CONCENTRATION IN REACTOR WATER.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM., 1717 H ST., WASH., D. C. 20545, $0.25 CENTS/PAGE

REACTOR, BWR + BORON + DESIGN CRITERIA + PRESSURE VESSELS + HAZARD, RELATIVE + COMPARISON, THEORY AND EXPERIENCE + ANIMAL, SPONGE + REACTOR, INTERNAL SUPERHEAT + *GETR (TR) + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RADIATION SAFETY AND CONTROL + REFUELING + PROPERTY, PHYSICAL + REPORT, PSAR + PROPERTY, CHEMICAL + CONTROL RODS

030682
CADLE RD
ROLE OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC TRITIATED METHANE
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH, BOULDER, COLO.
3 PAGES, J. GEOPHYS. RES., 72, PAGES 2251-3 (APRIL 15, 1967)

TRITIATED METHANE IN THE ATMOSPHERE RESULTS FROM TROPOSPHERIC EXCHANGE OF METHANE WITH TRITIATED HYDROGEN THAT HAS MIXED DOWNWARD FROM THE STRATOSPHERE. SPECIFICALLY, IT IS SUGGESTED THAT METHYLENE MAY BE PRODUCED FROM METHANE BY ELECTRICAL DISCHARGED AND OTHER IONIZATION PROCESSES IN THE LOWER ATMOSPHERE. AN EXPERIMENTAL INVESTIGATION WAS PERFORMED TO DETERMINE WHETHER ANY ATMOSPHERIC CONSTITUENTS WOULD REACT PREFERENTIALLY WITH METHYLENE PREVENTING ITS REACTION WITH TRITIATED HYDROGEN. IT WAS CONCLUDED THAT IT IS HIGHLY UNLIKELY THAT REACTIONS OF METHYLENE PRODUCE TRITIATED METHANE IN THE ATMOSPHERE.

*CHEMICAL REACTION + *STRATOSPHERE + *ATMOSPHERIC POLLUTION + *ATMOSPHERIC CHEMISTRY + ELECTROSTATIC CHARGE + CHEMICAL KINETICS

030690
POUTHIER J + ROSSI J
DETECTION OF RADIOACTIVE GASES IN THE CO2 COOLANT OF THE G2-G3 REACTORS
CENTRE DE PRODUCTION DE PLUTONIUM DE MARCOULE
CEA-R-3556 +. SEPT. 1968, 29P. (IN FRENCH)

THE CO2 COOLING THE REACTORS G2-G3 CONTAINS ACTIVATION GASES AND FISSION GASES. IT IS OF INTEREST

030690 *CONTINUED*
TO KNOW THEIR CONCENTRATION, FOR EXAMPLE TO BE ABLE TO DEDUCE RAPIDLY THE NORMS WHICH WOULD HAVE TO BE APPLIED IN THE CASE OF AN INCIDENT IN THE CIRCUIT. GAS-PHASE CHROMATOGRAPHY IS APPLIED DAILY FOR CARRYING OUT ANALYSES. THE CHROMATOGRAM HAS SEPARATE PEAKS DUE TO TRITIUM, ARGON-41, KRYPTON-85 AND THE -133 AND -135 ISOTOPES OF XENON. BY INTEGRATING EACH PEAK IT IS POSSIBLE TO CALCULATE THE SPECIFIC ACTION OF EACH PRODUCT. THE CONSTRUCTION OF AN APPARATUS FOR CARRYING OUT CONTINUOUS MEASUREMENTS IS UNDER CONSIDERATION.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

ACTIVITY BUILDUP + *CHROMATOGRAPHY + *FISSION GAS RELEASE + KRYPTON + NOBLE GAS + *CARBON DIOXIDE + XENON + ARGON + *ANALYTICAL TECHNIQUE + COOLANT CHEMISTRY + INSTRUMENT, COOLANT QUALITY + CALIBRATION

030778
WASCHER RE + HOWARD JO
RADIATION CONSIDERATIONS IN NUCLEAR POWER PLANTS
BABCOCK AND WILCOX, LYNCHBURG, VIRGINIA
TRG-68-80 +. OCTOBER 21, 1968, P. 46

IDENTIFIES MAJOR SOURCE OF RADIOACTIVITY AND RESULTANT DESIGN AND OPERATING PROBLEMS. (SOURCES) ARGON-41, CORROSION AND FISSION PRODUCTS, TRITIUM. (PROBLEMS) ACCESSIBILITY FOR MAINTENANCE BECAUSE INDIAN POINT 1 STEAM GENERATORS WERE 6 REMS/HR AT 700 EFP DAYS, IN-CORE INSTRUMENT REMOVAL REQUIRES SPECIAL SHIELDING. TRITIUM AND KRYPTON DURING REFUELING REQUIRE AIR PURGE.

AVAILABILITY - ROBERT E. WASCHER AND/OR JAMES O. HOWARD, BABCOCK AND WILCOX, LYNCHBURG, VIRGINIA

FISSION GAS RELEASE + MAINTENANCE AND REPAIR + REACTOR, POWER + *RADIATION SAFETY AND CONTROL

031269
GOTCHY PL
PROJECT RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE) PRODUCTION TESTS
NEVADA OPERATIONS OFFICE, LAS VEGAS, NEVADA
NVO-112 + PNE-R-57 +. 74 PAGES, 5 TABLES, FEBRUARY 1972

SUMMARIZES MOST OF THE SIGNIFICANT RADIOLOGICAL SURVEILLANCE DATA GENERATED DURING THE PRODUCTION TESTS OF PROJECT RULISON, A NUCLEAR GAS STIMULATION EXPERIMENT, DETONATED SEPTEMBER 10, 1969, IN NORTHWESTERN COLORADO. ALSO INCLUDES DATA ON THE RADIOCHEMICAL AND CHEMICAL QUALITY OF THE RULISON GAS DURING THE TESTS, AND ESTIMATES OF THE QUANTITIES OF 3H, 85KR, 14C, AND 203HG RELEASED TO THE ATMOSPHERE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON + KRYPTON + MERCURY + MONITOR, LIQUID + MONITOR, AIR + MONITOR, GAS + *NUCLEAR DETONATION + MONITOR, BACKGROUND + RADIOACTIVITY RELEASE + *SURVEILLANCE PROGRAM + *MONITOR, AREA + *GAS + CONCENTRATION + *STIMULATION + BENEFIT VS RISK + BENEFICIAL USE

033070
NELLIS DO + HUDSPETH EL + MORGAN IL + BUCHANAN PS + BOGGS RF
TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION
U. S. DEPT. OF HEALTH, EDUCATION, AND WELFARE
U. S. PUBLIC HEALTH SERVICE PUBLICATION NO. 999-RH-29 +. 47 PAGES, 15 FIGURES, 5 TABLES, AND 8 REFERENCES, FEB. 1969

TRITIUM-METALLIC TARGETS ARE FREQUENTLY USED IN MANY PARTICLE ACCELERATORS FOR THE PRODUCTION OF HIGH-ENERGY NEUTRONS. THE PURPOSE OF THIS STUDY WAS TO INVESTIGATE THE PROBLEMS AND HAZARDS ASSOCIATED WITH THE USE OF THESE TRITIUM TARGETS SO THAT APPROPRIATE STEPS CAN BE TAKEN TO MINIMIZE THE POTENTIAL RADIOLOGICAL HEALTH HAZARDS. THIS STUDY SHOWED THAT BOMBARDMENT OF TRITIUM TARGETS RESULTS IN THE LOSS OF ABOUT 1 TRITIUM ATOM FOR EACH BOMBARDING DEUTERON, AND THAT MOST OF THE TRITIUM IS IN A GASEOUS FORM WHEN IT LEAVES THE TARGET. IT WAS DETERMINED THAT A SMALL AMOUNT OF TRITIUM RELEASED FROM TARGET ACTUALLY REMAINS WITHIN THE ACCELERATOR ITSELF. MOST OF THE TRITIUM LOST BY A BOMBARDED TARGET IS TRAPPED IN THE ELEMENTS OF AN ION PUMP OR RELEASED THROUGH THE VACUUM SYSTEM EXHAUST.

AVAILABILITY - U. S. DEPT. OF HEALTH EDUCATION AND WELFARE, CONSUMER PROTECTION AND ENVIRONMENTAL HEALTH SERVICE, ENVIRONMENTAL CONTROL ADMINISTRATION

*HAZARD, RELATIVE + *VACUUM RELIEF + CONTAMINATION + RADIOACTIVITY RELEASE + *NEUTRON + *ACCELERATOR + ENERGY LEVEL + *GAS + HIGH

036038
AEC EXEMPTS USE OF SELF-LUMINOUS PRODUCTS CONTAINING TRITIUM, KRYPTON-85 AND PROMETHIUM-147
U.S. ATOMIC ENERGY COMMISSION
AEC PRESS RELEASE H-137 +. 2 PAGES, JUNE 5, 1969

THE AEC HAS ESTABLISHED A NEW CLASS EXEMPTION FROM LICENSING FOR THE USE OF PRODUCTS CONTAINING TRITIUM, KRYPTON-85, AND PROMETHIUM-147 AND HAS INCORPORATED SAFETY STANDARDS FOR THEIR MANUFACTURE IN ITS REGULATIONS. USE OF SELF-LUMINOUS PRODUCTS WHICH MEET THE SPECIFIC SAFETY STANDARDS WILL BE EXEMPT FROM FURTHER REGULATORY CONTROL. LICENSES TO MANUFACTURE AND DISTRIBUTE PRODUCTS IN THIS CLASS WILL STILL BE REQUIRED. HOWEVER, LICENSES TO MANUFACTURE A PRODUCT WHICH

036038 *CONTINUED*
MEETS THE NEW STANDSARDS MAY BE ISSUED WITHOUT THE NECESSITY OF AN INDIVIDUAL AMENDMENT TO THE AEC RULES. EXCLUDED FROM THE CLASS EXEMPTION ARE TOYS, ADORNMENTS AND FRIVOLOUS USES.

KRYPTON + PROMETHIUM + *REGULATION, AEC + *CONSUMER PRODUCT

036242
BAUMGARTNER F
REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING BURN-UP OF FUTURE FUELS
GESELLSCHAFT FUR KERNFORSCHUNG, KARLSRUHE
KFK-884 +. 13 PAGES, 2 TABLES, 36 REFERENCES, DECEMBER 1968

DISCUSSES IN GENERAL TERMS CONSECUENCES OF INCREASING BURNUP ON REPROCESSING. PROBLEMS FORESEEN INCLUDE TRANSPORT, MECHANICAL DISASSEMBLY, SOLVENT DAMAGE. THESE RESULT FROM HIGH FISSION-PRODUCT CONCENTRATIONS WITH CORRESPONDING AMOUNTS OF VOLATILE IODINE AND TRITIUM.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*FUEL BURNUP + IODINE + RADIATION DAMAGE + GERMANY + OFF GAS + SOLVENT EXTRACTION PROCESS + *FUEL REPROCESSING

036429
SMITH CF + MONYER FF
STUDIES OF CHEMICAL AND RADIOCHEMICAL COMPOSITION OF NATURAL GAS FROM THE CAVITY PRODUCED BY THE PROJECT GASBUGGY NUCLEAR SHOT
U.S. ATOMIC ENERGY COMMISSION + UNIVERSITY OF CALIFORNIA
8 PAGES, RADIOLOGICAL HEALTH DATA ANC REPORTS, 10(7), PAGES 281-88 (JULY 1969)

DATA RELATING TO THE CHEMICAL AND RADIOCHEMICAL RESULTS FROM PROJECT GASBUGGY CHIMNEY-GAS SAMPLES OBTAINED PRIOR TO 210 DAYS AFTER DETONATION (DECEMBER 10, 1967) ARE PRESENTED FOR SIGNIFICANT NON-RADIOACTIVE COMPONENTS OF THE GAS AND FOR TRITIUM AND KRYPTON-85. A DISCUSSION OF CHANGES IN COMPOSITION OCCURRING DURING THE FLARING OF 50,000,000 CU FT GAS IN THE LATE SPRING OF 1968 IS INCLUDED. SOME INTERPRETATION OF THE OBSERVED CHANGES IS ADVANCED BUT WITH THE DATA NOW AVAILABLE, NO DEFINITIVE CONCLUSIONS SEEM WARRANTED. THIS IS A STATUS REPORT OF THE CONTINUING EFFORT TO DEFINE AND UNDERSTAND THE CHEMICAL AND RADIOCHEMICAL ASPECTS OF PROJECT GASBUGGY.

*KRYPTON + *PLOWSHARE + *TESTING + *SAMPLING + ANALYTICAL TECHNIQUE + CHEMICAL ANALYSIS + NUCLEAR DETONATION + *GAS

036443
LIDSKY LM
FISSION-FUSION SYMBIOSIS - GENERAL CONSIDERATIONS AND A SPECIFIC EXAMPLE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
33 PAGES, PAPER FROM THE INTERNATIONAL CONFERENCE ON NUCLEAR FUSION REACTORS, CULHAM, ENGLAND, SEPTEMBER 17-19, 1969

CONCEIVABLE NEAR-TERM FUSION REACTORS MAY OR MAY NOT PRODUCE ECONOMICAL ELECTRICAL POWER BUT, BECAUSE OF THEIR COMBINATICN OF VERY HIGH CONVERSION RATIO (1.35-1.55) AND A VERY SPECIFIC INVENTORY (2 X 10-3 KG/MWTH), THEY WILL CERTAINLY HAVE A VERY LOW FUEL DOUBLING TIME (0.1 YR). IT IS POSSIBLE TO USE SOME OF THE RESULTANT NEUTRON EXCESS TO PRODUCE FISSILE FUEL IN A FUSION REACTOR.

*ECOLOGY + *EFFLUENT + *REACTOR, POWER + *REACTOR, THERMONUCLEAR

036855
WEAVER CL + HARWARD EO + PETERSON HT
TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWER PLANTS
BUREAU OF RADIOLOGICAL HEALTH
9 PAGES, 3 TABLES, 12 REFERENCES, PUBLIC HEALTH REPORTS, 84(4), PG 363-371, APRIL 1969

INTENDED AS A GENERAL INFORMATION GUIDE ON TRITIUM FOR PERSONS IN FEDERAL, STATE, COUNTY, AND LOCAL PUBLIC HEALTH ACTIVITIES. THE VARIOUS SOURCES AND MECHANISMS FOR RELEASE OF TRITIUM AND ITS PATHWAY FROM NUCLEAR FACILITIES TO THE ENVIRONMENT ARE DESCRIBED.

ADMINISTRATIVE CONTROL + *COUNTER + *GUIDE + INGESTION + REGULATION + HAZARD, RELATIVE + *ACTIVATION PRODUCT + BETA EMITTER + *ANALYTICAL TECHNIQUE + POPULATION EXPOSURE + REACTOR + *ENVIRONMENT + LIQUID

037402
KORANDA JJ + ANSPAUGH LR + MARTIN JR
THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
13 PAGES, 8 FIGURES, 4 TABLES, 26 REFERENCES, IEEE TRANSACTIONS ON NUCLEAR SCIENCE, 19(1), PP. 27-39 (FEBRUARY 1972)

TRITIUM IS PRODUCED NATURALLY ANC WAS PRESENT IN LOW CONCENTRATIONS IN PRECIPITATION AND NATURAL BODIES OF WATER BEFORE ATMOSPHERIC TESTING OF NUCLEAR WEAPONS. OTHER SOURCES OF TRITIUM ARE NOW PRESENT FROM WHICH TRITIUM IS RELEASED TO THE ENVIRONMENT. NUCLEAR REACTOR TRITIUM PRODUCTION, ACCORDING TO RECENT ESTIMATES, WILL EQUAL NATURAL TRITIUM PRODUCTION BEFORE THE YEAR 2000.

037402 *CONTINUED*
PREDICTED INCREASES OF TRITIUM IN THE ENVIRONMENT WILL TAKE PLACE FIRST ON A LOCAL ECOLOGICAL LEVEL AND THEN APPEAR ON A BIOSPHERIC LEVEL. ITS BEHAVIOR IN THE ENVIRONMENT IS DISCUSSED.

*ECOLOGY + *WATER + *EVAPORATION + *HYDROLOGY + *PRECIPITATION + *RADIOACTIVITY RELEASE + ENVIRONMENT + WATER VAPOR + BEHAVIOR + *TRANSPIRATION + VAPOR EXCHANGE

037466
RAY JW
TRITIUM IN POWER REACTORS
BATTELLE MEMORIAL INSTITUTE, COLUMBUS LABORATORIES
8 PAGES, 3 FIGURES, 17 REFERENCES, REACTOR AND FUEL-PROCESSING TECHNOLOGY, 12(1), PAGES 19-26 (WINTER 1968-1969)

DISCUSSES HEALTH PHYSICS ASPECTS, PRODUCTION RATES IN POWER REACTORS, MIGRATION OF TRITIUM, AFFINITY FOR WATER, MIGRATION FROM FUEL PINS, CONTROL AND DISPOSAL. FOR A TYPICAL 1000-MW(E) REACTOR, 40 CURIES/DAY IS PRODUCED BY FISSION. FOR 1000-MW(E) PWR WITH BORON CHEMICAL SHIM, ADDITIONAL TRITIUM IS GENERATED AS A RESULT OF NEUTRON CAPTURE BY BORON. THE PRODUCTION GRADUALLY INCREASES UNTIL 16 CURIES/DAY IS PRODUCED AFTER 365 DAYS OF OPERATION.

*ACTIVITY BUILDUP + FISSION PRODUCT, VOLATILE + INGESTION + INHALATION + *WASTE DISPOSAL + REACTOR, POWER + REACTOR COOLANT + COOLANT CHEMISTRY + PERSONNEL EXPOSURE, RADIATION + CHEMICAL SHIM + MAIN COOLING SYSTEM + RADIATION EFFECT

038117
ARNOLD WD + CROUSE DJ
CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE) - PROGRESS REPORT FOR APRIL 1 - JUNE 30, 1969
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-2689 +. 16 PAGES, 3 FIGURES, 3 REFERENCES, AUGUST 25, 1969

RU-106 CONTAMINATION OF CEMENT COPPER WAS NOT CHANGED SIGNIFICANTLY BY CHANGE IN PH. *** TRITIUM CONTAMINATION OF OIL INCREASED ONLY SLIGHTLY WHEN PRESSURE INCREASED FOR 160 TO 860 PSIG. *** CONSTRUCTION OF EQUIPMENT FOR ANALYSIS OF MATERIAL GAS SAMPLES NEARLY COMPLETE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

PLOWSHARE + RUTHENIUM

021802
CREVER, FE
A STUDY OF WATER PLANT ISOLATION FROM CONTAMINATION
U.S. OFFICE OF SALINE WATER
U.S. OFFICE OF SALINE WATER RESEARCH AND DEVELOPMENT REPORT NO. 526 +. 141 PAGES, OCTOBER 1969

THE WORK WAS CONDUCTED TO DETERMINE THE POTENTIAL CONCENTRATION OF RADIOACTIVE NUCLIDES IN THE WATER PLANT BRINE, EFFLUENT, AND PRODUCT WATER FOR DUAL PURPOSE POWER GENERATION AND DESALTING PLANTS USING NUCLEAR STEAM SUPPLY SYSTEMS. THE NUCLEAR STEAM SUPPLY SYSTEMS CONSIDERED WERE THOSE USING THE LIGHT WATER COOLED AND MODERATED REACTORS. THE DIRECT CYCLE SYSTEM USING THE BOILING WATER REACTOR, AND THE PRESSURIZED WATER REACTOR USING THE INDIRECT CYCLE WERE BOTH CONSIDERED. DATA ARE PRESENTED SHOWING CONCENTRATIONS IN REACTOR WATER FOR BOTH TYPES OF OPERATING REACTORS. THESE ARE GENERALLY MUCH LOWER THAN THE DESIGN BASIS CONCENTRATIONS. POSSIBLE WATER PLANT CONTAMINATION IN THE CASE OF THE DIRECT CYCLE STEAM FOR BRINE HEATING CAN RESULT FROM ANY ONE OF THE FOLLOWING - ACTIVATION BY GAMMA RAYS FROM N16 IN THE STEAM, ACTIVATION BY NEUTRONS FROM N17 IN THE STEAM, LEAKAGE OF NOBLE GAS FISSION PRODUCTS WITH STEAM INTO THE WATER PLANT, LEAKAGE OF SOLUBLE AND INSOLUBLE PARTICULATE FISSION PRODUCTS WITH STEAM INTO THE WATER PLANT, AND LEAKAGE OF TRITIUM INTO THE WATER PLANT WITH THE STEAM.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON D.C. 20402

*NOBLE GAS + STEAM + WATER + *ACTIVATION PRODUCT + NITROGEN + WATER TREATMENT + OPERATING EXPERIENCE + HEAT EXCHANGERS

038161
IZRAEL YA + TEVEROVSKY EN
PROSPECTS OF WIDE PEACEFUL USE OF ATOMIC ENERGY WITH RADIATION SAFETY OF POPULATION
CHIEF ADMINISTRATION OF THE HYDROMETEOROLOGICAL SERVICE OF THE USSR
A/CONF.49/P/684 + CONF-710901-321 +. 13 PAGES, 1 TABLE, 16 REFERENCES, PRESENTED AT THE FOURTH UNITED NATIONS INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, SEPTEMBER 6-16, 1971

PAPER REVIEWS WORLD ENERGY OUTLOOK INSOFAR AS CONSUMPTION OF FUEL, PREDICTIONS OF TOTAL ENERGY FROM NUCLEAR PLANTS, RELEASE OF RADIOACTIVITY UNDER NONACCIDENT AND ACCIDENT CONDITIONS ASSUMING PREDICTED POTENTIALITY OF ACCIDENTS OCCURRING. ALSO, AMOUNTS OF POLLUTANTS FROM FOSSIL PLANTS ARE GIVEN. THIS PAPER PRESENTS A VERY SCHOLARLY CALCULATION OF RELEASES OF RADIOELEMENTS UNDER ABOVE-MENTIONED CONDITIONS. EXAMPLES -- (1) IN PROCESSING OF EXHAUSTED FUEL FROM A 800 MW FACILITY, ONE TON WOULD RELEASE 0.42 MILLION CURIE OF KR-85; (2) SOME REACTORS IN U. S. RELEASE UP TO 650 CI/DAY OF AR-41; (3) BASED ON NUMBER OF REACTORS BY YEAR 2000, NUMBER OF SIGNIFICANT ACCIDENTS POSSIBLE, AND RESULTANT RELEASES OF I-131, CS-137, SR-89, 90; (4) DISTRIBUTION OF LONG-LIVED TRITIUM AND KR-85 DUE TO NORMAL OPERATION AND WORLDWIDE DISTRIBUTION.

038161 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON + CESIUM + IODINE + KRYPTON + HAZARD, RELATIVE + STRONTIUM + ATMOSPHERIC POLLUTION + ARGON + ACCIDENT, PROBABILITY OF + POPULATION EXPOSURE + *USSR + *RADIOACTIVITY RELEASE + INTERNATIONAL + DATA COLLECTION + CANCER + N-POWER, SAFETY OF + *POWER PLANT, NUCLEAR

038862
GREEN JB + LESSLER RM
REDUCTION OF TRITIUM FROM UNDERGROUND NUCLEAR EXPLOSIVES
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-73258 +. 2 PAGES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 14(2), PP. 694-695 (OCTOBER 1971)

THE INDUSTRIAL APPLICATION OF THE PLOWSHARE CONCEPT OF CURRENT INTEREST IS THE STIMULATION OF NATURAL GAS. THE DEGREE OF SUCCESS OF THIS AND OTHER APPLICATIONS MAY BE SIGNIFICANTLY AFFECTED BY THE AMOUNT OF TRITIUM PRODUCED BY THE NUCLEAR EXPLOSION. THE REDUCTION OF RESIDUAL TRITIUM HAS BEEN THE SUBJECT OF CONTINUING RESEARCH AND EVALUATION. BOTH PUBLIC SAFETY AND ECONOMICS ARE CONSIDERED IN PLANNING THIS REDUCTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*CONTAINMENT, UNDERGROUND + ECONOMICS + PLOWSHARE + TESTING + *NUCLEAR DETONATION + POPULATION EXPOSURE + *RADIATION SAFETY AND CONTROL + *RADIOACTIVITY RELEASE + *SAFETY EVALUATION

040008
JAMME E + WOOD JI
EXPERIENCE WITH HEAVY WATER MANAGEMENT IN THE HALDEN REACTOR DURING OPERATION ON ITS SECOND FUEL CHARGE
HPR-92 +. 57 PAGES, DECEMBER 1967

THE REACTOR WAS MADE CRITICAL ON ITS 2ND CHARGE FOR THE FIRST TIME IN MARCH 1962. AFTER A SERIES OF LOW POWER EXPERIMENTS AT VARIABLE PRESSURES AND TEMPERATURES, HIGH POWER OPERATION STARTED IN OCTOBER 1962. THE SECOND-CHARGE OPERATION ENDED ON 14TH DECEMBER, 1966. DURING THIS PERIOD THE PLANT HAD BEEN OPERATED AT VARIABLE POWER LEVELS UP TO 25 MW. THE POWER EXPERIMENTS INCLUDED TESTING OF FOUR DIFFERENT INSTRUMENTED FUEL ASSEMBLIES, XENON POISONING EXPERIMENTS, STEAM LOAD VARIATION EXPERIMENTS, REACTIVITY PERTURBATION EXPERIMENTS, FLUX AND VOID MEASUREMENTS AND NOISE MEASUREMENTS. BY THE END OF THE SECOND CHARGE OPERATION IN DECEMBER 1966, THE REACTOR HAD BEEN ON PRESSURE FOR ABOUT 22000 HRS., MOST OF THE TIME AT 28.5 AT (230 C). THE INTEGRATED POWER ON THE SECOND CHARGE WAS 9340 MWD OR ABOUT 6500 MWD/TUO2 AVERAGE. THIS REPORT DEALS WITH THE HEAVY WATER MANAGEMENT AND THE EXPERIENCE WITH LOSSES AND DEGRADATION OF HEAVY WATER DURING THE PERIOD.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*REACTOR, BWR + *HEAVY WATER + *REACTOR, HWR + *OPERATING EXPERIENCE SUMMARY + NORWAY + MAIN COOLING SYSTEM + COOLANT QUALITY + LEAK

040046
TSAI CM + WENG PS
A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT
NATIONAL TSING HUA UNIVERSITY, HSINCHU, TAIWAN
9 PAGES, 11 REFERENCES, HO TSU K-O HSUEH, VOL. 6, PAGES 51-9 (OCTOBER 1968) (IN CHINESE)

TRITIUM AND OTHER RADIOACTIVE NUCLIDES HAVE BEEN INDUCED IN THE TSING HUA OPEN-POOL REACTOR (THOR) COOLANT BY THE EXPOSURE OF MINUTE AMOUNTS OF DEUTERIUM AND IMPURITIES EXISTING IN THE COOLANT WATER TO THE NEUTRONS AFTER SOME 6,000,000 KWH OPERATION. A MIXED BED RESIN WAS TRACED BY THE TRITIUM AND THE FISSION PRODUCT STANDARD SOURCES AND THEN PASSED THROUGH BY THE COOLANT SAMPLE OF WHICH 3 MILLILITERS WERE DISSOLVED IN THE LIQUID SCINTILLATOR. WITH AN AID OF A L IQUID SCINTILLATION COUNTER THE TRITIUM CONTENT WAS FOUND TO BE 5740 +- 2.1 PERCENT T.U. THE REACTOR POWER OUTPUT CAN BE ESTIMATED FROM THE TRITIUM ACTIVITY, PARTICULARLY UNDER LONG TIME AND HIGH POWER OPERATION.

*COUNTER + DEUTERIUM + *SAMPLING + *COOLANT CHEMISTRY + RESIN

041509
JUSTIFICATION SUPPORTING TECH SPEC CHANGES AT THE NBS RESEARCH REACTOR
NATIONAL BUREAU OF STANDARDS
16 PAGES, 1 FIGURE, 2 REFERENCES, LETTER - NATIONAL BUREAU OF STANDARDS TO DIVISION OF REACTOR LICENSING - JANUARY 15, 1970, DOCKET 50-184

THREE AUTOMATIC TRIPS (AN ALARM, A RUNDOWN AND A SCRAM) ARE SET FOR LOW COOLANT LEVEL EACH TO INITIATE AT SUCCESSIVE 6 INCH LEVEL. A SERIES OF TEMPERATURE AND VOID COEFFICIENT OF REACTIVITY MEASUREMENTS INDICATE A NEGATIVE VALUE IN ALL CASES. SINCE THE N-16 MONITOR IS A CONTINUOUSLY INDICATING DEVICE AND OPERATIONAL CHECKS PERFORMED MONTHLY, AN ANNUAL CALIBRATION CHECK IS SUFFICIENT. THE N-16 MONITOR ON THE SECONDARY COOLING SYSTEM, AND THE LIQUID LEVEL MONITOR ON THE D2O STORAGE TANK ARE SUFFICIENTLY RELIABLE SO THAT TRITIUM SAMPLING OF SECONDARY SYSTEM ON A MONTHLY BASIS IS SUFFICIENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

041509 *CONTINUED*
DEUTERIUM + MONITOR, LIQUID + REACTIVITY COEFFICIENT + *REACTOR, RESEARCH + TEMPERATURE COEFFICIENT + VOID COEFFICIENT + *CONTROL ROD SCRAM MECHANISM + *INSTRUMENT, LIQUID LEVEL + *ABS

043845
EXPERT OPINION ON THE SAFETY OF THE RESEARCH AND MEASUREMENT REACTOR, BRUNSWICK
TECHNOLOGICAL SUPERVISION ASSOCIATION HANOVER INC. + INSTITUTE FOR REACTOR SAFETY OF THE TUV, INC.
50 PAGES, FIGURES, RESEARCH AND MEASUREMENT REACTOR SAFETY EVALUATION, MAY 1966

EXPERT OPINION ON THE RESEARCH AND MEASUREMENT REACTOR BRUNSWICK (FOR DESCRIPTION SEE SAFETY REPORT ON THIS REACTOR). IT IS CONCLUDED THAT THE REACTOR WILL, NEITHER IN NORMAL OPERATION NOR IN CREDIBLE ACCIDENTS, CAUSE UNDUE RADIATION IN THE SURROUNDINGS. THIS PROPOSES THAT FURTHER DOCUMENTATION (LISTED IN SECTION 12) IS SUPPLIED AND DOES NOT LEAD TO OBJECTIONS, THAT THE INITIAL TESTS (LISTED IN SECTION 8) ARE CARRIED OUT SATISFACTORILY AND THAT RECURRENT TESTS (LISTED IN SECTION 8.2) ARE CARRIED OUT BY INDEPENDENT EXPERTS.

AVAILABILITY - TECHNISCHER UBERWACHUNGS-VEREIN HANOVER E.V., GERMANY

PROCEDURES AND MANUALS + *REACTOR, RESEARCH + SHUTDOWN MARGIN + GERMANY + REACTOR, INTERACTING + RADIOACTIVITY RELEASE + REACTOR, POOL TYPE + *SAFETY ANALYSIS + LEAK RATE

043846
SAFETY OPINION ON THE INSTITUTION OF A HEAVY WATER SYSTEM RESEARCH AND MEASUREMENT REACTOR IN THE BRUNSWICK AND ON THE OPERATION OF THE REACTOR WITH TWO CORES
TECHNOLOGICAL SUPERVISION ASSOCIATION HANOVER, INC. + INSTITUTE FOR REACTOR SAFETY OF THE TUV, INC.
24 PAGES, RESEARCH AND MEASUREMENT REACTOR SAFETY OPINION, JUNE 1969

THE CONDITIONS NAMED IN SECTION 7 OF THE OPINION SHOULD BE INCORPORATED IN THE LICENSE. ASSUMING THIS, THERE ARE NO OBJECTIONS AGAINST THE MODIFICATION AND COMMISSIONING OF THE REACTOR. NEITHER IN NORMAL OPERATION, NOR IN CASE OF AN ACCIDENT IS AN INCREASE EXPECTED IN THE RADIOLOGICAL DOSE, COMPARED TO THE SITUATION ALREADY APPROVED. REGARDING TESTS SEE EXPERT OPINION ON THE SAFETY OF THE FMRB, TUV HANOVER AND IRS OF THE TUV, MAY 1966, SECTION 8.

AVAILABILITY - INSTITUT FUR REAKTORSICHERHEIT DER TUV E.V., GERMANY

PROCEDURES AND MANUALS + *REACTOR, RESEARCH + SHUTDOWN MARGIN + GERMANY + *REACTOR, INTERACTING + RADIOACTIVITY RELEASE + *REACTOR, POOL TYPE + *SAFETY ANALYSIS + LEAK RATE

043979
RADFORD EP
ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD
6 PAGES, ATOMIC ENERGY CLEARING HOUSE, 16(5), PG 25-30 (FEBRUARY 2, 1970)

SPEAKER DEVELOPS A SCHOLARLY PRESENTATION OF POTENTIAL EFFECTS OF TRITIUM RELEASES. HE POINTS OUT THAT MOST SERIOUS SOURCE WOULD BE FROM FUEL REPROCESSING PLANTS, ALTHOUGH RELEASES TO WATER (CHESAPEAKE BAY) CAN BE HIGHLY SIGNIFICANT. ASSUMING THE AEC ACCEPTS THE LINEAR-DOSE-RESPONSE, NONTHRESHOLD, AND MAXIMUM-PERMISSIBLE-CONCENTRATION CONCEPTS, THEN HE HAS FIGURES TO SHOW POTENTIAL POPULATION MUTAGENIC EFFECTS (SPERM AND OVA). HE DIVIDES DOSES DUE TO VARIOUS RADIATION SOURCES PERCENTAGEWISE. IN ADDITION HE STATES HIS CONSIDERED ACCEPTABLE GENETIC RISK FROM TRITIUM. FROM THESE HE DEVELOPS HIS THESIS. HENCE, MANKIND MUST BE PREPARED TO ACCEPT CERTAIN RISKS, AND THE AEC WOULD SERVE BEST IF IT AWAKENS PUBLIC TO THEIR RESPONSIBILITIES FOR TACKLING THE WHOLE RANGE OF ENVIRONMENTAL PROBLEMS. DECISIONS MADE NOW CAN INFLUENCE GENERATIONS TO COME FOR CENTURIES.

CRUSTACEAN + CESIUM + CODES AND STANDARDS + CONGRESSIONAL ACTIVITY + FRC + KRYPTON + STRONTIUM + *REACTOR, POWER + ICRP + NCRP + RADIOACTIVITY RELEASE + WATER POLLUTION + FUEL REPROCESSING + CALVERT CLIFFS 1 (PWR) + DATA COLLECTION + FOOD CHAIN + AQUATIC ORGANISM + EFFECT, GENETIC + (TAMPLIN A) + INDUSTRY, NUCLEAR + BIOLOGICAL CONTROL + OPPONENT + *SOCIO/PHILOSOPHICAL CONSIDERATION

044066
IN THE UTILITIES
1 PAGE, NUCLEONICS WEEK, PG 4 (OCTOBER 9, 1969)

COOK COUNTY SANITARY DISTRICT MAY FILE SUIT AGAINST ELECTRIC MICHIGAN NUCLEAR POWER STATION. ITS UNALTERABLE POSITION IS THAT NO WASTE GO INTO LAKE MICHIGAN AND NO CHANGE WHATSOEVER IN THE TEMPERATURE. IT OBJECTS TO THERMAL AND TRITIUM INJECTION PLUS THREAT OF RADIOACTIVE LEAKAGE. IT SEES PLANT DISCHARGES AS A THREAT TO CHICAGO WATER SUPPLY. (SEVERAL BIG STEEL PLANTS PRESENTLY BEING SUED.)

*REACTOR, POWER + WATER POLLUTION + THERMAL POLLUTION + COOK 1 (PWR) + ZION 1 (PWR) + *AGENCY, MUNICIPAL + *LITIGATION + OPPONENT + SPOKESMAN, STATE

044158
DUDEY ND
REVIEW OF LOW-MASS ATOM PRODUCTION IN FAST REACTORS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-7434 +. 37 PAGES, 7 FIGURES, 8 TABLES, 77 REFERENCES, APRIL 1968

044158 *CONTINUED*
PRESENTS A LITERATURE REVIEW OF LOW-MASS CHARGED-PARTICLE YIELDS IN FISSION. A SEMIEMPERICAL METHOD FOR CALCULATING THE YIELDS OF HYDROGEN AND HELIUM ISOTOPES FROM FAST-NEUTRON FISSION OF URANIUM AND PLUTONIUM IS PRESENTED. TRITIUM PRODUCTION IN REACTOR FUELS IS ESTIMATED AT 327 CURIES PER METRIC TON OF U-235 AND 40 CURIES PER METRIC TON OF A 50% MIXED U-235/PU-239 THERMAL REACTOR FUEL HAVING A BURNUP RATING OF 20,000 MW(T)-D. TRITIUM PRODUCTION IN FAST REACTORS IS ESTIMATED TO BE 10% LOWER FOR U-235 FUEL AND 10% HIGHER FOR PU-239 FUEL THAN FOR THERMAL REACTORS. A PLUTONIUM-FUELED FAST REACTOR IS ESTIMATED TO PRODUCE TWICE AS MUCH TRITIUM AS A URANIUM-FUELED THERMAL REACTOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FUEL BURNUP + *RADIOISOTOPE + REACTOR PHYSICS

044524
FRAAS AP + POSTMA H
PRELIMINARY APPRAISAL OF THE HAZARDS PROBLEM
OAK RIDGE NATIONAL LABORATORY, TN
ORNL-TM-2822 +. 37 PAGES, 5 FIGURES, 8 TABLES, 25 REFERENCES, APPRIL 1970

PRELIMINARY ASSESSMENT OF THE HAZARDS PROBLEMS OF A D-T FUSION REACTOR TO PROVIDE SOME NOTION OF SERICUSNESS OF THESE PROBLEMS. INHERENT CHARACTERISTICS OF MAGNETICALLY CONFINED PLASMAS APPEAR TO BE SUCH THAT ANY TENDENCY TOWARD GENERAL POWER OVERSHOOTS OR LOCAL HOT SPOTS WILL BE MORE THAN COMPENSATED BY OTHER FACTORS. TRITIUM PRODUCTION RATE WILL RUN ROUGHLY 1000 TIMES THAT IN FISSION REACTOR. PLANT DESIGN CAN KEEP AT ABOUT THE SAME LEVEL AS IN CONVENTIONAL. FUSION REACTOR GIVES A FACTOR OF ROUGHLY 1,000,000 REDUCTION IN THE TOTAL BIOLOGICAL HAZARD POTENTIAL. AFTERHEAT IN A FUSION REACTOR IS LOWER BY A FACTOR OF ABOUT 40,000.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

ACTIVITY BUILDUP + ECOLOGY + DEUTERIUM + EXPLOSION + *HAZARDS ANALYSIS + CONTAINMENT STRUCTURE + *FISSION PRODUCT, AIRBORNE + RADIOACTIVITY RELEASE + *HEAT GENERATION, INTERNAL + EQUIPMENT DESIGN + *REACTOR, THERMONUCLEAR

044674
JUNKINS RL
BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
CONF-690303 +. 11 PAGES, PP. 133-43 OF THE PROCEEDINGS OF A SYMPOSIUM ON BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE, LIVERMORE, CALIFORNIA, MARCH 5-7, 1969

THE RELEASES OF RADIONUCLIDES FROM REACTORS AND THE ENVIRONMENTAL EFFECTS OF THESE RELEASES HAVE BEEN STUDIED SINCE THE EARLY 1940S. CONTROLS BASED ON THE KNOWLEDGE GAINED FROM THESE STUDIES HAVE BEEN ADEQUATE TO MAINTAIN THE RADIATION EXPOSURE OF THE PUBLIC WELL WITHIN ACCEPTABLE LIMITS. THE SIGNIFICANT PATHWAYS OF EXPOSURE HAVE BEEN IDENTIFIED. OVER THE YEARS IMPROVED METHODS OF WASTE TREATMENT AND CONTAINMENT TECHNOLOGY FOR REACTORS HAVE EVOLVED TO THE POINT WHERE RELEASE OF WASTE HEAT FROM POWER REACTORS NOW APPEAR TO BE RECEIVING MORE PUBLIC ATTENTION THAN THE RELEASE OF RADIONUCLIDES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIOMEDICAL + ECOLOGY + FALLOUT + WASTE TREATMENT + CONTAINMENT R AND D + SAVANNAH RIVER PLANT + CHALK RIVER + RADIOISOTOPE + ENVIRONMENT + HANFORD SITE + *REACTOR, PRODUCTION + *RADIONUCLIDE TRANSFER

044967
HULL AP
NUCLIDES OF CONCERN IN THE ENVIRONMENTAL ASPECTS OF NUCLEAR POWER OPERATION
BROOKHAVEN NATIONAL LABORATORY
10 PAGES, 1 FIGURE, 15 REFERENCES, PAPER PRESENTED AT THE PUBLIC AFFAIRS WORKSHOP ON RADIATION AND MANS ENVIRONMENT, BUCK HILL, PA., APRIL 19-22, 1970

THE CATASTROPHE POTENTIAL OF NUCLEAR PLANTS HAS BEEN VASTLY OVEREXAGGERATED BY THEIR ADVERSARIES. SUCH RISKS AS DO EXIST HAVE BEEN PROVIDED FOR, FAR BEYOND THE DISASTER POTENTIAL OF ANY OTHER LARGE SCALE TECHNOLOGY. WITH REGARD TO ROUTINE EFFLUENTS, NUCLEAR PLANTS PRODUCE FAR LESS AIR POLLUTION THAN THEIR FOSSIL COUSINS. THE CONCENTRATIONS OF RADIOACTIVITY IN THEIR LIQUID EFFLUENTS ARE CONTROLLABLE AT LEVELS WELL BELOW RADIATION PROTECTION STANDARDS, AND POSE NO THREAT TO THE ENVIRONMENT.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 850 THIRD AVENUE, NEW YORK, NEW YORK 10022

*ADMINISTRATIVE CONTROL + CODES AND STANDARDS + *EFFLUENT + IODINE + KRYPTON + HAZARD, RELATIVE + ATMOSPHERIC POLLUTION + XENON + *RADIATION SAFETY AND CONTROL + *RADIOACTIVITY RELEASE + ENVIRONMENT

045016
MCBRIDE DISCUSSES FUEL REPROCESSING
ATOMIC INDUSTRIAL FORUM, INC.
1 PAGE, INFO ISSUE NO. 27 (SUPPLEMENT), P. 5 (MAY 1970)

045016 *CONTINUED*
THE DIR. OF AEC DIV. OF MATERIALS LICENSING DISCUSSES THE CONCERN TO ENVIRONMENTALISTS OF INCREASING NUMBER OF REPROCESSING PLANTS, BECAUSE THESE REPRESENT ONLY OPERATION IN NUCLEAR-INDUSTRY CYCLE WHERE FISSION PRODUCTS ARE MOBILE. KRYPTON AND TRITIUM MERIT MOST ATTENTION. LOCAL EXPOSURE FROM HIGH-CAPACITY PLANTS MAY DICTATE A REQUIREMENT TO SEPARATE THEM FROM PLANT EFFLUENT (E.G., NFS PLANT, W. VALLEY, N.Y.). AEC FEELS IT IS PRACTICAL TO ACHIEVE A REDUCTION IN PRESENT EFFLUENT LEVELS. HE COVERS SR-90 BUILDUP IN A PERSON EATING FISH, AND CS-137 FROM EATING DEER (BOTH FROM ENVIRONS OF PLANT). THE ROCHESTER COMMITTEE FOR SCIENTIFIC INFORMATION REPORTED EXCESSIVE STRONTIUM RELEASED IN NFS EFFLUENT. BASED ON NFS AND N.Y. DEPT. OF HEALTH DATA, AEC INVESTIGATED AND FOUND WITHIN LIMITS. HE DESCRIBED PLANNED REPROCESSING PLANTS BY GE AND ALLIED CHEMICAL AND THEIR PLANS FOR EFFLUENT CONTROL

CODES AND STANDARDS + FRC + FISSION PRODUCT RELEASE + KRYPTON + *RADIOACTIVITY RELEASE + NFS + *FUEL REPROCESSING + RADIONUCLIDE UPTAKE + ANIMAL, FISH + CONCENTRATION + MAMMAL + MAN + INDUSTRY, NUCLEAR + ORGANIZATION, CITIZEN + SPOKESMAN, AEC

045018
HULL A
ANDREW HULL ON KRYPTON, TRITIUM
ATOMIC INDUSTRIAL FORUM, INC.
1 PAGE, INFO ISSUE NO. 27 (SUPPLEMENT), PG 5 (MAY 1970)

THE SUPV. OF ENVIRONMENTAL MONITORING OF BNL DISCUSSED NUCLIDES OF CONCERN IN THE ENVIRONMENTAL ASPECTS OF NUCLEAR POWER OPERATIONS -- PRIMARILY TRITIUM AND KRYPTON. TRITIUM APPEARS TO BE ONE OF GREATEST CONCERN. IF TEN 1000 MEGAWATT (E) PRESSURIZED WATER REACTORS EACH DISCHARGED 3000 CI/YR INTO LONG ISLAND SOUND, A PERSON DERIVING HIS ENTIRE FOOD SUPPLY FROM AQUATIC ORGANISMS IN THE SOUND WOULD RECEIVE A DOSE OF 0.00007 REM/YR. HE STATES THAT THE LOW LEVELS OF RADIATION ASSOCIATED WITH ROUTINE RELEASES FROM REACTORS ARE NOT DEMONSTRATABLE BUT ARE RATHER AN INFERRED PROBABILITY FROM OBSERVED HIGH-LEVEL, DOSE-EFFECT RATIOS.

DOSE + FISSION GAS RELEASE + FISSION PRODUCT RELEASE + KRYPTON + *REACTOR, POWER + *RADIOACTIVITY RELEASE + WATER POLLUTION + *DATA COLLECTION + AQUATIC ORGANISM + RADIATION EFFECT + SPOKESMAN, AEC

045077
KENNY AW
RADIOACTIVE CONTAMINATION ARISING FROM THE PEACEFUL USES OF ATOMIC ENERGY - PAST, PRESENT, AND FORESEEABLE FUTURE
MINISTRY OF HOUSING AND LOCAL GOVERNMENT, LONDON
STI/PUB-226 + CONF-690317 +. 12 PAGES, PG. 15-26 OF THE PROCEEDINGS OF A SEMINAR ON AGRICULATURAL AND PUBLIC HEALTH ASPECTS OF ENVIRONMENTAL CONTAMINATION BY RADIOACTIVE MATERIALS, VIENNA, AUSTRIA, 1969

THE DEVELOPMENT OF ENVIRONMENTAL CONTAMINATION IS TRACED FROM THE OCCASIONAL CONTAMINATION BY NATURAL RADIONUCLIDES BEFORE THE WAR TO THE PRESENT WORLD-WIDE CONTAMINATION BY KR-85 AND H-3 AND LOCAL CONTAMINATION BY RELEASED FISSION PRODUCTS AND BURIED TRASH. TECHNIQUES ARE AVAILABLE TO LIMIT THIS CONTAMINATION TO ANY DESIRED LEVEL, EXCEPT POSSIBLY IN THE CASE OF TRITIUM, AND THEY SHOULD BE SUFFICIENT FOR THE CONTROL OF ENVIRONMENTAL CONTAMINATION AS THE INDUSTRY GROWS. NEW DEVELOPMENTS SUCH AS NUCLEAR CIVIL EXPLOSIVES AND POWER SOURCES ARE DISCUSSED. ATTENTION IS DRAWN TO THE POTENTIALLY SERIOUS HAZARD FROM LOSS OF HIGHLY ACTIVE SEALED SOURCES USED IN THE FIELD.

*KRYPTON + HAZARD, RELATIVE + *WASTE DISPOSAL + *CONTAMINATION + ENVIRONMENT + SOURCE, RADIATION, LOST

045079
PETERSON HT + MARTIN JE + WEAVER CL + HARWARD ED
ENVIRONMENTAL TRITIUM CONTAMINATION FROM INCREASING UTILIZATION OF NUCLEAR ENERGY SOURCES
PUBLIC HEALTH SERVICE, WASHINGTON, D.C.
STI/PUB-226 + CONF-690317 +. 26 PAGES, PG. 35-60 OF THE PROCEEDINGS OF THE SEMINAR ON AGRICULTURAL AND PUBLIC HEALTH ASPECTS OF ENVIRONMENTAL CONTAMINATION BY RADIOACTIVE MATERIALS, VINNA, AUSTRIA, 1969

TRITIUM IS PRODUCED IN NUCLEAR REACTORS BY TERNARY FISSION AND BY NEUTRON CAPTURE REACTIONS IN B-10, LI-6, LI-7, N-14, AND H2. THE EXPANDING USE OF NUCLEAR REACTORS FOR POWER PRODUCTION WILL CONTRIBUTE ADDITIONAL AMOUNTS OF TRITIUM TO THE EXISTING BACKGROUND LEVELS DUE TO ATMOSPHERIC TESTING OF NUCLEAR DEVICES AND NATURAL PRODUCTION BY COSMIC-RAY INTERACTIONS IN THE UPPER ATMOSPHERE. PRODUCTION PROCESSES, BOTH IN THE ENVIRONMENT AND IN NUCLEAR AND THERMONUCLEAR ENERGY SOURCES, ARE REVIEWED.

TESTING + *NUCLEAR DETONATION + *COSMIC RADIATION + *CONTAMINATION + REACTOR POWER + ENVIRONMENT + *FUEL REPROCESSING

045400
JACOBS DG + BARTON CJ + KELLY MJ + BOWMAN CR
THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. PHASE II - HYPOTHETICAL POPULATION EXPOSURES OUTSIDE SAN JUAN BASIN
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-4748 +. 27 PAGES, 10 FIGURES, 5 TABLES, 36 REFERENCES, FEBRUARY 1972

THE HYPOTHETICAL IMPACT OF THE USE OF NATURAL GAS, PRODUCED BY NUCLEAR-DETONATION STIMULATION, IN WEST COAST CITIES IS CONSIDERED (FOR COMMERCIALLY USEFUL NUCLEAR EXPLOSIVES DESIGNED TO PRODUCE LOW LEVELS OF TRITIUM). EXPOSURES OF ABOUT 2% THE PERMISSIBLE LEVEL RESULT FOR HOMES HEATED WITH

045400 *CONTINUED*
UNVENTED SPACE HEATERS, OR FROM GAS-FUELED POWERPLANT PLUMES AT THE PEAK CONCENTRATION DURING INVERSION PERIODS. UNDER CONDITIONS OF AVERAGE DAILY USAGE OF GAS AND AVERAGE WIND FREQUENCIES AND SPEED, THE DOSE AT POINTS OF PEAK CONCENTRATION IS ABOUT 0.1% OF THE PERMISSIBLE LEVEL IN THE INSTANCE OF THE LOS ANGELES BASIN AND 0.02% IN THE SAN FRANCISCO BAY AREA. EXPOSURES SEVERAL ORDERS BELOW THE PERMISSIBLE LEVEL RESULT VIA THE PATHS - EMISSIONS FROM CARBON-BLACK MANUFACTURE, USE OF FERTILIZER CONTAINING AMMONIA MANUFACTURED FROM NATURAL GAS, FATS AND OILS PROCESSED WITH HYDROGEN MANUFACTURE FROM NATURAL GAS, OR DRINKING OF ALCOHOL DERIVED FROM ETHANE FROM NATURAL GAS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

INHALATION + PLOWSHARE + WASTE DISPOSAL, ATMOSPHERIC + AGRICULTURE + PLUME BEHAVIOR + DOSE CALCULATION, INTERNAL + HAZARDS ANALYSIS + CRITICAL NUCLIDE PATHWAY + *EXCAVATION, NUCLEAR + POWER PLANT, FOSSIL FUEL + *FUEL, FOSSIL + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + *RADIONUCLIDE TRANSFER + INVERSION + STIMULATION + RESOURCE, NATURAL

047843
MOUNTAIN JE + LEONARD JH
TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR
UNIVERSITY OF CINCINNATI
1 PAGES, 1 TABLE, 5 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 13(1), P. 220 (JUNE 1970)

TRITIUM PRODUCTION CYCLE OF THE SAN ONOFRE AND CONNECTICUT YANKEE REACTORS FROM TERNARY FISSION AND FROM BORON AND LITHIUM COOLANT ADDITIVES WAS EVALUATED. PRODUCTION OF TRITIUM WAS EVALUATED AS A FUNCTION OF VARIOUS PARAMETERS WHICH AFFECT THE REMOVAL RATE OF LI-7 FROM THE COOLANT. THE RELATIVE CONTRIBUTION OF EACH TRITIUM-PRODUCING REACTION WAS OBTAINED, AS WELL AS THE RELATIVE TRITIUM ACTIVITY PRODUCED BY EACH REACTION IN THE CORE AND REFLECTOR. TRITIUM RELEASE DATA FOR CONNECTICUT YANKEE WAS COMPARED TO THE TRITIUM ACTIVITY CALCULATED FOR THE BORON AND LITHIUM NEUTRON REACTIONS.

AVAILABILITY - J.E. MOUNTAIN, UNIVERSITY OF CINCINNATI, OHIO 45521

BORON + DECONTAMINATION + *DIFFUSION + *CLADDING + FISSION GAS RELEASE + REACTOR, PWR + POISON, SOLUBLE + *REACTOR COOLANT + *SAN ONOFRE 1 (PWR) + *STEEL, STAINLESS + *RADIOACTIVITY RELEASE + ENVIRONMENT + LITHIUM + *LEAK + PARAMETER

049348
THOMPSON TJ
AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS
1 PAGE, NUCLEAR INDUSTRY, PG 19 (JUNE 1970)

COMMISSIONER THOMPSON QUESTIONED INDUSTRYS CAPABILITY TO BUILD N-POWER REACTORS WITH ZERO EFFLUENT AND THE ADVISABILITY OF BUILDING THEM. HE EXPRESSED THESE REMARKS AT THE S. INTERSTATE NUCLEAR BOARD BRIEFING FOR STATE AND LOCAL OFFICIALS. IT IS UNDERSTOOD THAT HIS VIEWS DIFFER FROM THOSE OF HIS FELLOW COMMISSIONERS. HE SAYS IT IS MISLEADING TO THE PUBLIC TO SAY OR EVEN IMPLY ZERO RELEASE. THE TRITIUM WILL BE HELD AND RECIRCULATED UNTIL IT BUILDS UP TO SOME EQUILIBRIUM VALUE (20 YR), THEN IT STILL HAS TO GO INTO THE ENVIRONMENT. MINOR RELEASES FROM TIME TO TIME MAY IN THE LONG RUN PROVE TO BE ENVIRONMENTALLY BETTER THAN THE RELEASE OF A LARGE QUANTITY OF TRITIATED WATER.

FISSION PRODUCT RELEASE + *REACTOR, POWER + *WASTE MANAGEMENT + RADIATION EFFECT + INDUSTRY, NUCLEAR + *SPOKESMAN, AEC + (THOMPSON T)

051840
PIPER AM
POTENTIAL APPLICATIONS OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES.
TEI-857 +.

DIFFUSION + PLOWSHARE + WATER + ION EXCHANGE + SOIL + EQUIPMENT DEVELOPMENT

052407
HORTON JH
FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.
DPSPU-63-30-388 +.

FISSION PRODUCT RELEASE + RIVER + SAVANNAH RIVER PLANT + PLANT

052569
LIBBY WF
RADIOACTIVE FALLOUT.
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OFAMERICA 44 PAGES 800-820 1958

CARBON + FALLOUT + STRONTIUM + AIR + RADIOISOTOPE

052691
HARTELL EA
ARTIFICIAL RADIOACTIVITY FROM NUCLEAR TESTS UP TO NOVEMBER 1958.
AFCRC-TN-59-444 + GRD-RN-19 +.

CARBON + FALLOUT + STRONTIUM + AIR + RADIOISOTOPE

053739
PARKER FL
RADIOACTIVE WASTES FROM FUSION REACTORS.
SCIENCE 159 PAGES 83-84 1968

DOSE + WASTE DISPOSAL + REACTOR + RADIOISOTOPE

054495
ERIKSSON E
HISTORY OF THE MAJOR PULSES OF TRITIUM IN THE STRATOSPHERE.
STI/DOC/10/73 +.

STRATOSPHERE

055111
BARTON CJ + BUTLER HM + CUMMING RB + ROHWER PS
THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS
11 PAGES, 1 TABLE, 2 REFERENCES, NUCLEAR SAFETY, 13(3), PP. 225-235 (MAY-JUNE 1972)

A TRITIUM SYMPOSIUM SPONSORED BY THE WESTERN ENVIRONMENTAL RESEARCH LABORATORY OF THE ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA AT LAS VEGAS WAS HELD IN LAS VEGAS AUG. 30 TO SEPT. 2, 1971. NEARLY 100 PAPERS WERE PRESENTED COVERING A BROAD RANGE OF TOPICS, INCLUDING TRITIUM PRODUCTION, ITS MOVEMENT IN THE ENVIRONMENT, ENVIRONMENTAL RELEASE AND MONITORING, DETECTION AND MEASUREMENT, BIOLOGICAL EFFECTS, BIOKINETICS, APPLICATIONS IN BIOLOGY AND MEDICINE, AND HEALTH PHYSICS. THIS ARTICLE TOUCHES ON ALL ASPECTS OF THE MEETING, BUT PAPERS OF PARTICULAR INTEREST IN THE FIELD OF NUCLEAR SAFETY ARE EMPHASIZED.

*AIRBORNE RELEASE + *BIOMEDICAL + MONITOR, LIQUID + *MONITOR, AIR + ANALYTICAL TECHNIQUE + *MONITORING SYSTEM, RADIATION

055112
KELLY MJ + BARTON CJ + MEYER AS + CHEN EH + BOWMAN CK
THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-4775 +. 41 PAGES, FIGURES, TABLES, JULY 1972

DATA OBTAINED IN THIS PLANT TEST INDICATE THAT PROCESSING OF NATURAL GAS CONTAINING TRITIATED HYDROCARBONS AT LEVELS EXPECTED TO PREVAIL IN LARGE-SCALE EXPLOITATION OF THE NUCLEAR GAS-STIMULATION TECHNIQUE WILL NOT PRESENT SIGNIFICANT RADIATION EXPOSURE PROBLEMS FOR PLANT PERSONNEL. NO EVIDENCE OF EXCHANGE OF TRITIATED HYDROCARBONS WITH THE PLANT PROCESSING OIL WAS FOUND, AND IT SEEMS PROBABLE THAT PLANT OPERATORS IN ANY PROCESSING PLANT WOULD RECEIVE DOSES LESS THAN 1% OF NATURAL BACKGROUND FROM BREATHING AIR CONTAINING COMBUSTION PRODUCTS RESULTING FROM IN-PLANT USE OF THE TRITIUM-CONTAMINATED GAS AS FUEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLOWSHARE + *NUCLEAR DETONATION + DOSE MEASUREMENT, EXTERNAL + *CONTAMINATION + *PERSONNEL EXPOSURE, RADIATION + GAS + *CONSUMER PRODUCT + STIMULATION + RESOURCE, NATURAL

055988
ANALYSIS SHOWS RULISON GAS SAFE FOR POTENTIAL CUSTOMER USE
2 PAGES, NUCLEAR INDUSTRY, 19(1), PP. 31-32 (JANUARY 1972)

POTENTIAL CUSTOMERS OF NATURAL GAS FROM PROJECT RULISON WELL WILL RECEIVE LESS RADIATION FROM IT THAN THEY WOULD FROM THE SUN, IF THEY MOVED TO AN ELEVATION 60 INCHES HIGHER. OAK RIDGE NATIONAL LABORATORY SCIENTISTS PERFORMED THE ANALYSIS. REPORT OF STUDY IS BEING PUT INTO FINAL DRAFT. INITIAL CALCULATIONS WERE BASED ON LEVELS OF RADIOACTIVITY WHEN THE CAVITY WAS FIRST REENTERED IN SPRING OF 1970. BASED ON DRAWDOWN AND DILUTION BY FRESH GAS FLOWING INTO CHIMNEY, FIRST YEAR AVERAGE TRITIUM WAS CALCULATED. EXPOSURE FROM KR-85 WAS LARGELY IGNORED, SINCE IT REPRESENTS LESS THAN 1% OF THE POTENTIAL EXPOSURE FROM TRITIUM. FROM THAT STARTING POINT, TYPES OF STRUCTURES, USE OF GAS STOVES, HEATERS AND REFRIGERATORS, NUMBER OF HEATING DAYS, WIND PATTERNS, PLUME DISPERSAL, ETC. WERE CONSIDERED.

*PLOWSHARE + RADIATION IN PERSPECTIVE + *POPULATION EXPOSURE + INDUSTRY, MINING + FUEL, FOSSIL + *RADIATION EXPOSURE

058861
LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
BRH/NERHL 70-2 +. 59 PAGES, 19 FIGURES, 23 TABLES, NOVEMBER 1970

LIQUID WASTE EFFLUENTS FROM NUCLEAR FUEL SERVICES WERE STUDIED DURING A SIX-MONTH PERIOD MAY THROUGH OCTOBER 1969. CONCENTRATIONS AND AMOUNTS OF INDIVIDUAL RADIONUCLIDES DISCHARGED FROM THE PLANT WERE MEASURED AND THE AMOUNTS OF SEDIMENTATION OF INDIVIDUAL RADIONUCLIDES IN THE LAGOON SYSTEM WERE ESTIMATED. TRITIUM, RUTHENIUM-106, STRONTIUM-90, CESIUM-137 AND CESIUM-134 WERE THE PRINCIPAL RADIONUCLIDES DISCHARGED TO THE ENVIRONMENT DURING THIS PERIOD. DURING JUNE AND NOVEMBER 1969 SIMULTANEOUS SAMPLING WAS CARRIED OUT AT THE POINT OF DISCHARGE OF THE WASTE AND SEVERAL LOCATIONS ON THE BUTTERMILK AND CATTARAUGUS CREEKS. TRITIUM, RUTHENIUM-106, AND STRONTIUM-90 WERE THE RADIONUCLIDES PRESENT IN THE HIGHEST CONCENTRATIONS IN THESE STREAMS DURING THESE PERIODS. STREAM DILUTION AND ABSORPTION FACTORS WERE CALCULATED FOR INDIVIDUAL RADIONUCLIDES AT VARIOUS LOCATIONS ALONG THE STREAM SYSTEM. A COMPARISON OF THE CONCENTRATIONS OF THE RADIONUCLIDES IN CATTARAUGUS CREEK WITH 10CFR20 DISCHARGE CONCENTRATIONS LIMITS. ALL RADIONUCLIDES WERE WELL BELOW CONCENTRATION LIMITS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + MEASUREMENT + RUTHENIUM + STRONTIUM + REGULATION, AEC + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RADIOACTIVITY RELEASE + NFS + FUEL REPROCESSING + MONITORING PROGRAM, ENVIRONMENTAL + CONCENTRATION + SEDIMENT

061133
LEGER D + DIRIAN D + ROTH E
TRITIUM EXTRACTION FROM HEAVY WATER IN NUCLEAR REACTORS
8 PAGES, ENERGIE NUCLEAIRE, 12(2), PP. 135-142 (MARCH-APRIL 1970)

AS THE ACCUMULATION OF TRITIUM IN THE HEAVY WATER OF A REACTOR IS A VERY SERIOUS INCONVENIENCE, IT IS OF IMPORTANCE THAT ITS CONTINUOUS EXTRACTION BE DEVELOPED. VARIOUS METHODS ARE DESCRIBED, PARTICULARLY A PROCESS BASED ON THE CATALYTIC EXCHANGE WITH DEUTERIUM GAS FOLLOWED BY A DISTILLATION OF THIS DEUTERIUM. CALCULATIONS PERTAINING TO THIS METHOD LED TO A PROJECT FOR THIS PROCESS TO BE INSTALLED IN THE FRENCH-GERMAN HIGH FLUX REACTOR AT GRENOBLE.

*DECONTAMINATION + *HEAVY WATER + *USSR + R AND D PROGRAM + GAS

061540
THOMAS RH
POSSIBLE CONTAMINATION OF GROUND WATER SYSTEM BY HIGH ENERGY PROTON ACCELERATORS
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY
UCRL-20131 + CONF-701106-4 +. 21 PAGES, FROM SYMPOSIUM OF THE HEALTH PHYSICS SOCIETY, IDAHO FALLS, IDAHO, OCTOBER 1970

A GENERAL EVALUATION OF THE PROBLEM OF POSSIBLE GROUND WATER CONTAMINATION DUE TO THE RELEASE OF ACCELERATOR PRODUCED RADIONUCLIDES TO GROUND SHOWS IT TO BE AN UNLIKELY PROBLEM FOR EXISTING AND PROJECTED HIGH ENERGY ACCELERATORS IN THE ENERGY REGION OF SEVERAL HUNDRED GEV.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BERYLLIUM + DILUTION + MPC + *SURFACE CONTAMINATION + *GROUND WATER, NUCLIDE OCCURRENCE + CONTAMINATION + HYDROLOGY + *RADIOACTIVITY RELEASE + THERMAL NEUTRON + *ACCELERATOR + MODEL

061864
OESTMANN MJ
TRITIUM SOURCES AND RELEASES TO THE ENVIRONMENT
ARGONNE NATIONAL LABORATORY
2 PAGES, 1 TABLE, 3 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 13(2), PP. 486-487 (NOVEMBER 1970)

DIFFERENT SOURCES OF TRITIUM PRODUCED IN NUCLEAR POWER PLANTS THROUGH TERNARY FISSION AND FROM BORON AND LITHIUM COOLANT ADDITIVES WERE IDENTIFIED AND THE TRANSPORT MECHANISMS AND LEVEL OF TRITIUM ACTIVITY RELEASED TO THE ENVIRONMENT FROM POWER PLANTS AND FUEL REPROCESSING PLANTS HAVE BEEN EVALUATED. THE SIGNIFICANCE OF THESE TRITIUM LEVELS IN RELATIONSHIP TO THOSE PRESENT FROM NATURAL PROCESSES AND NUCLEAR WEAPONS TESTING AND IN REGARD TO BEING A SOURCE OF POPULATION EXPOSURE IS POINTED OUT.

AVAILABILITY - M.J. OESTMANN, ARGONNE NATIONAL LABORATORY, 9700 S. CASS AVENUE, ARGONNE, ILLINOIS

*REACTOR, BWR + *REACTOR, PWR + *REGULATION, AEC + WASTE DISPOSAL, LIQUID + POPULATION EXPOSURE + WASTE MANAGEMENT + *PRODUCTION + PRODUCTION, RATE

062087
UNRUH CM
PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION
BATTELLE-NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-SA-3354 +. 15 PAGES, PRESENTED AT THE HEALTH PHYSICS SOCIETY ANNUAL MEETING, CHICAGO, ILLINOIS, JUNE 28-JULY 2, 1970

062087 *CONTINUED*
SUMMARIZES SOME IMPORTANT SOURCES OF ENVIRONMENTAL RADIATION, NAMELY TRITIUM AND KR-85. THE WORLDWIDE CONSEQUENCES OF CURRENT TRITIUM AND KR-85 RELEASE PRACTICES FROM 1965 TO THE YEAR 2000 ARE PRESENTED. SINCE IT APPEARS CERTAIN THAT SOME MIX OF NUCLEAR-FUELED AND FOSSIL-FUELED ELECTRIC POWER PLANTS WILL BE USED TO MEET NEEDS THROUGH THE YEAR 2000, THE QUANTITIES OF NON-RADIOACTIVE WASTE GENERATED BY FOSSIL-FUELED POWER STATIONS WILL ALSO BE PRESENTED. THE DATA IS PRESENTED WITH NO ATTEMPT TO BALANCE THE RELATIVE BENEFITS OF EITHER ELECTRICAL-GENERATION METHOD OR THE WASTE PROCESSING AND CONTROL REQUIRED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DOSE + *FISSION PRODUCT RELEASE + *KRYPTON + PLOWSHARE + SOURCE, RADIATION + TESTING + *AIR + NUCLEAR DETONATION + SOURCE, VOLUME + POPULATION EXPOSURE + *RADIOACTIVITY RELEASE + ENVIRONMENT + *FORECAST + *POWER PLANT, FOSSIL FUEL + CONCENTRATION + POLLUTION + *MAN + N-POWER FORECAST + INSTRUMENTS, MISC.

062170
JACOBS DG + KELLY MJ + BARTON CJ + BOWMAN CR + BRIGGS GR + CULKOWSKI WM + RCHWER PS + STRUXNESS EG
THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. FINAL REPORT, PHASE 1 - IMPACT OF HYPOTHETICAL RELEASES OF CONTAMINATED GAS IN THE SAN JUAN BASIN
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-4646 +. 41 PAGES, SEPTEMBER 1971

THE ONLY LONG-LIVED RADIONUCLIDES FOUND IN THE GASBUGGY GAS WERE KR-85, H-3, AND LOW CONCENTRATIONS OF C-14. THE TRITIUM, WHICH WILL BE PRESENT IN NATURAL GAS COMBUSTION PRODUCTS AS HTO, HAS THE GREATER RADIOLOGICAL IMPACT AND IS CONSIDERED IN MORE DETAIL. THE CONCENTRATION OF THESE SPECIES IN THE CAVITY GAS DECREASED AS GAS REMOVED FROM THE WELL WAS REPLACED BY UNCONTAMINATED FORMATION GAS. *** VARIOUS PATHWAYS BY WHICH INDIVIDUALS LIVING WITHIN THE SAN JUAN BASIN COULD HYPOTHETICALLY BE EXPOSED TO RADIOACTIVITY FROM CONTAMINATED GAS ARE CONSIDERED, AND POTENTIAL DOSES ARE CALCULATED. WE CONCLUDE THAT OF THOSE PATHWAYS CONSIDERED, THE CRITICAL EXPOSURE PATHWAY WOULD BE DOMESTIC CONSUMPTION OF GAS FOR COOKING, AND THE CRITICAL POPULATION GROUP WOULD BE COMPOSED OF HOUSEWIVES IN THE BLANCO CAMP ADJACENT TO THE BLANCO PROCESS PLANT. CALCULATED DOSES ARE MUCH LOWER THAN DOSE LIMITS SET BY NATIONAL AND INTERNATIONAL AUTHORITIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON + KRYPTON + *PLOWSHARE + POPULATION EXPOSURE + *CRITICAL NUCLIDE PATHWAY + DOSE CALCULATION, EXTERNAL + *SAFETY EVALUATION + *GAS + CONSUMER PRODUCT + CONCENTRATION

062229
BARTON CJ + JACOBS DG + KELLY MJ
QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL POPULATION EXPOSURES IN METROPOLITAN AREAS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-3338 +. 22 PAGES, MARCH 8, 1971

NATURAL GAS FROM THE GASBUGGY WELL COULD HYPOTHETICALLY HAVE BEEN USED EITHER IN LOS ANGELES OR IN SAN FRANCISCO IF IT HAD BEEN PUT INTO EL PASO NATURAL GAS COMPANYS DISTRIBUTION SYSTEM INSTEAD OF BEING FLARED. POPULATION WEIGHTED AVERAGE DOSE EQUIVALENTS TO THE WHOLE BODY, CALCULATED WITH THE ASSUMPTION THAT THE GAS CONTAINS 1.0 PCI/CM3 OF TRITIUM AT THE POINT OF USE, ARE 0.024 MILLIREM/YEAR FOR INHABITANTS OF THE LOS ANGELES BASIN AND 0.007 MILLIREM/YEAR FOR PEOPLE IN THE SAN FRANCISCO BAY AREA. THE RADIATION DOSES FOR MAXIMUM EXPOSURE CONDITIONS IN THE ATMOSPHERE WERE ESTIMATED TO BE 0.19 AND 0.024 MILLIREM/YEAR, RESPECTIVELY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSIMETRY + FRC + *PLOWSHARE + REGULATION + *ACCIDENT, HYPOTHETICAL + *POPULATION EXPOSURE + DOSE CALCULATION, EXTERNAL + *INCINERATION + RADIOACTIVITY RELEASE + METEOROLOGY + *GAS + *CONSUMER PRODUCT + PROTECTIVE ACTION GUIDE + CONCENTRATION

062380
GOODJOHN AJ + FORTESCUE P
ENVIRONMENTAL ASPECTS OF HIGH-TEMPERATURE GAS-COOLED REACTORS
GULF GENERAL ATOMIC, SAN DIEGO, CALIFORNIA
GA-10567 +. 18 PAGES, 5 FIGURES, 3 TABLES, APRIL 2, 1971

CONCLUSIONS - TECHNIQUES ARE AVAILABLE THAT CAN REDUCE THE GASEOUS AND LIQUID RADIOACTIVE EFFLUENT FROM A HTGR PLANT TO NEGLIGIBLE LEVELS. REDUCTIONS IN THE EFFECTS OF WASTE-HEAT DISCHARGE CAN BE ACCOMPLISHED BY USING DRY COOLING TOWERS TO REJECT THE HEAT TO THE ATMOSPHERE RATHER THAN TO ADJACENT BODIES OF WATER. STEAM PLANTS ARE PENALIZED BY USING DRY COOLING TOWERS (CYCLE EFFICIENCY, FUEL-CYCLE COST, AND LOSS IN CAPACITY DURING HOT WEATHER). THE CLOSED-CYCLE GAS-TURBINE IS IDEALLY SUITED TO AIR COOLING AND APPEARS TO OFFER A VERY PRACTICAL LONG-TERM SOLUTION TO MINIMIZING THE EFFECTS OF WASTE-HEAT REJECTION ON THE ENVIRONMENT.

AVAILABILITY - A.J. GOODJOHN, GULF GENERAL ATOMIC COMPANY, P.O. BOX 608, SAN DIEGO, CALIFORNIA

KRYPTON + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + *WASTE MANAGEMENT + *HELIUM + COOLANT PURIFICATION SYSTEM + *REACTOR, HTGR + *THERMAL POLLUTION + *COOLING TOWER

062398
HICKS JH + MRAVICH NJ + POCOCK FJ
NUCLEAR STEAM SUPPLY WATER CHEMISTRY RESEARCH
BABCOCK AND WILCOX COMPANY, LYNCHBURG, VIRGINIA
12 PAGES, 7 FIGURES, 5 TABLES, 17 REFERENCES, PAPER PRESENTED AT THE AMERICAN POWER CONFERENCE, CHICAGO, ILLINOIS, APRIL 20-21, 1971

THE NUCLEAR STEAM SUPPLY SYSTEM SUPPLIED BY THE BABCOCK AND WILCOX COMPANY IS DESCRIBED FROM A WATER CHEMISTRY VIEWPOINT. A PORTION OF THE RESEARCH PROGRAMS USED TO ESTABLISH THE WATER CHEMISTRY REQUIREMENTS FOR THIS SYSTEM ARE DISCUSSED. REACTOR COOLANT CHEMISTRY RESEARCH INCLUDES THE CHOICE OF PH ADDITIVE, MATERIALS BEHAVIOR, WATER ANALYSIS, AND COOLANT PURIFICATION. WATER CHEMISTRY RESEARCH FOR THE OTSG INCLUDES THE BEHAVIOR OF DISSOLVED AND SUSPENDED SOLIDS, BEHAVIOR OF BORIC ACID, CONDENSATE POLISHING, AND CHEMICAL CLEANING. MAINTENANCE AND CLEANNESS DURING FABRICATION AND ERECTION, AND WATER QUALITY DURING INITIAL FILL AND COMMISSIONING ARE EQUALLY AS IMPORTANT AS CONTROL OF THE WATER CHEMISTRY DURING NORMAL RESTART, OPERATION, SHUTDOWN, AND REFUELING.

BORON + IODINE + GROSS BETA + GROSS GAMMA + CORROSION + *COOLANT CHEMISTRY + HYDRIDE + ION EXCHANGE + *SYSTEM DESCRIPTION + ZIRCALOY + SURFACE FILM DEPOSIT + COOLANT PURIFICATION SYSTEM + FLUORIDE + ADDITIVE + SOLID + EFFECT, PH

063263
MILLS RG
POTENTIAL ADVANTAGES OF FUSION POWER REACTORS
PRINCETON UNIVERSITY, NEW JERSEY
4 PAGES, 11 REFERENCES, IEEE TRANSACTIONS ON NUCLEAR SCIENCE, 19(1), PP. 10-13 (FEBRUARY 1972)

AUTHOR CITES NEW OPTIMISM OVER POSSIBILITIES OF SUCCESSFUL FUSION REACTOR, I.E., TOKAMAK. NEW MACHINES ARE NEEDED TO DEMONSTRATE ABSENCE OF TWO POTENTIAL ADVERSE EFFECTS (GIVEN). EXAMINES TYPES OF MACHINES AND NEED FOR BREEDING, ALTHOUGH BREEDING RATIO NEED BE ONLY 1.01 OR LESS, I.E., A DOUBLING TIME AS SHORT AS 3 YR. REGARDING WASTE PRODUCTS, NIL; BUT INVENTORY OF TRITIUM (FEW KILOGRAMS) AND NEUTRON FLUX POSE HAZARD. TRITIUM GAS THAT ESCAPES POSES NO APPARENT BIOLOGICAL PROBLEM. ACTIVATION OF REACTOR COMPONENTS WOULD BE HIGH, BUT CUT UP AFTER USE AND COULD BE ALLOWED TO DECAY. FUEL COSTS WOULD NOT BE SIGNIFICANT AND WOULD RESULT IN POWER AT FEW THOUSANTHS OF MIL/KWH. EVEN IF COMPONENTS WOULD HAVE TO BE REPLACED FREQUENTLY, CAPITAL COSTS WOULD BE LOW BECAUSE OF URBAN SITING WITH LOW TRANSMISSION COSTS. FUEL SOURCE (DEUTERIUM AND LITHIUM) UNIVERSALLY FOUND AVAILABLE TO ALL.

ECONOMICS + HAZARD, RELATIVE + SITING, REACTOR + WASTE DISPOSAL + *ELECTRIC POWER + ACCIDENT, HYPOTHETICAL + RADIOACTIVITY RELEASE + *ENVIRONMENT + SITING, URBAN + *REACTOR, THERMONUCLEAR + WASTE HEAT + POWER TRANSMISSION + N-POWER, SAFETY OF + *SOCIO/PHILOSOPHICAL CONSIDERATION

063662
THE BLASCON
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
3 PAGES, ORNL REVIEW, 4(3), PG. 7-9 (SPRING 1971)

ARTICLE DESCRIBES A SMALL THERMONUCLEAR GENERATOR CONCEPT, ONE THAT WOULD DEVELOP POWER AS LOW AS 20 MW (CA. 30,000 HP). A GENERATOR OF THIS SIZE WOULD BE SUITABLE FOR USE ON SHIPS AND SPACECRAFT, AND CONCEIVABLY EVEN BE USED TO ELECTRIFY RAILROADS AND SUPPLY POWER FOR HIGH-ENERGY-CONTENT STORAGE BATTERIES FOR AUTOMOBILES. HISTORICALLY, PROCESS WAS CONSIDERED AS MEANS FOR IGNITING PLASMA IN A LARGE THERMONUCLEAR REACTOR. PROCESS WOULD CONSIST OF LASER IGNITION OF A DEUTERIUM-TRITIUM PELLET IN CENTER OF A MOLTEN LITHIUM WHIRLPOOL. CONTAINMENT IS ONE PROBLEM. WALL THICKNESS OF 12 FT SPHERICAL VESSEL IS THEORETICALLY 30 IN. BY INTRODUCING FINE BUBBLES (5 VOL. %) COULD BE REDUCED TO 3-6 IN. AT PRESENT TIME, KIND OF HIGH-POWER LASER NEEDED HAS NOT BEEN DEVELOPED, BUT WORK ON SUCH IS UNDERWAY.

AVAILABILITY - OAK RIDGE NATIONAL LABORATORY, BUILDING 45-0 NORTH, OAK RIDGE, TENNESSEE

DEUTERIUM + PRESSURE VESSELS + *ELECTRIC POWER + LITHIUM + LASER + *EXPERIMENT + R AND D PROGRAM + *REACTOR, THERMONUCLEAR + INDUSTRY, TRANSPORTATION

063703
POSTMA H
ENGINEERING AND ENVIRONMENTAL ASPECTS OF FUSION POWER REACTORS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
6 PAGES, NUCLEAR NEWS, 14(4), PG. 57-62 (APRIL 1971)

AUTHOR EMPHASIZES PROBLEMS ASSOCIATED WITH MANUFACTURE OF FUSION REACTOR FROM ENGINEERING STANDPOINT. TITLES OF TABLES ARE GIVEN HERE, BECAUSE THEY ARE INDICATIVE OF EXTREME DIFFICULTY AND COMPLEXITY OF PROBLEMS BESETTING THE SCIENTIST IN DEVELOPING FUSION PROCESS, ALSO THE VERY COMPREHENSIVE CHARACTER OF THE REPORT--REACTIONS (FUEL CYCLES AND REACTION ENERGY), ASSUMPTIONS (FUEL, OPERATION, CYCLE, REACTOR TYPE, AND OPTIONAL PROCESSES), ENGINEERING ASPECTS (E.G., MAGNETIC FIELD, MATERIALS), FUEL RESOURCES, MAGNETIC FIELD, BREEDING, TRITIUM (E.G., INVENTORY, PRODUCTION AND BURNUP RATES), MATERIALS CONSIDERATIONS, RADIATION DAMAGE (TO MATERIALS), INVENTORIES OF PRINCIPAL VOLATILE ISOTOPES (CF. PWR AND FUSION AT 2800 MWE), STORED ENERGY (N-SAFETY OF LMFBR VS LMFBR), AND FINALLY A FUSION-FISSION HYBRID CONCEPT (CTR-MSC VS MSC).

RADIATION DAMAGE + RELEASE RATE + RADIOACTIVITY RELEASE + *ENVIRONMENT + LITHIUM + SYSTEM DESCRIPTION + SAFETY EVALUATION + REACTOR PHYSICS + *SURVEY + *REACTOR, THERMONUCLEAR + SYSTEM ANALYSIS + COOLING DEVICE + N-POWER, SAFETY OF

C63905
HOLZER A
PLOWSHARE AND THE ENVIRONMENT
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-72830 +. 2 PAGES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 13(2), PP. 632-633 (NOVEMBER 1970)

DEEPLY-BURIED UNDERGROUND NUCLEAR EXPLOSIONS USED IN THE RECOVERY OF MINERALS AND NATURAL GAS CAN HAVE A POSITIVE IMPACT ON THE ENVIRONMENT. TO PUT THIS ON A QUANTITATIVE BASE, ONE CAN COMPUTE EMISSIONS FROM A HYPOTHETICAL 1000 MWE PLANT USING COAL, OIL, OR NUCLEARLY-STIMULATED GAS AND EXAMINE THE RELATIVE EFFECTS DOWNWIND FROM THE PLANT. THE TRADE-OFFS BETWEEN SO2 EMISSIONS FROM COAL AND OIL, AND TRITIUM AND KRYPTON FROM THE NUCLEARLY-STIMULATED GAS CAN THEN BE EVALUATED UNDER IDENTICAL CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAINMENT, UNDERGROUND + KRYPTON + *PLOWSHARE + *REACTOR, POWER + NUCLEAR DETONATION + DOSE CALCULATION, EXTERNAL + *ENVIRONMENT + *SAFETY EVALUATION + *GAS + *FUEL, FOSSIL + *CONCENTRATION + *COMPARISON + RESOURCE, NATURAL

064412
SIDDONS RA
STUDIES OF RADIOACTIVITY FROM NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES
ATOMIC WEAPONS RESEARCH ESTABLISHMENT, BERKSHIRE, ENGLAND
1 PAGE, PG. 43, PAPER PRESENTED ON ENGINEERING WITH NUCLEAR EXPLOSIVES, JANUARY 14-16, 1970, CONF. 700101

ESTIMATED THE EXTENT AND DURATION OF HAZARDS FROM RADIOACTIVITY TO THE GENERAL PUBLIC DUE TO FALLOUT FROM A CRATERING EXPLOSION. THE NUCLEAR EXPLOSIVE IS ASSUMED TO BE CLEAN IN THE SENSE THAT ONLY A SMALL FRACTION OF THE YIELD IS DERIVED FROM FISSION. ILLUSTRATIVE EXAMPLES TAKE AN EXPLOSIVE OF TOTAL YIELD 100 KT, OF WHICH 10 KT, 1 KT, AND ZERO - THE ULTIMATE IN CLEANNESS - ARE DERIVED FROM FISSION. THE MAXIMUM PERMITTED LEVEL TO THE PUBLIC IS TAKEN AS 0.5 REM IN ONE YEAR. SOURCES OF ACTIVITY CONSIDERED ARE FISSION PRODUCTS, RESIDUAL FISSILE MATERIAL (PLUTONIUM), RESIDUAL THERMONUCLEAR MATERIAL (TRITIUM), NEUTRON-INDUCED ACTIVITY IN THE DEVICE MATERIALS, AND NEUTRON-INDUCED ACTIVITY IN THE SURROUNDING ROCK.

*FISSION PRODUCT RELEASE + *MPC + PLUTONIUM + *REGULATION + HAZARD, RELATIVE + *MPD + NUCLEAR DETONATION + *POPULATION EXPOSURE + *HAZARDS ANALYSIS + RADIATION SAFETY AND CONTROL + RADIOACTIVITY RELEASE + *FISSION PRODUCT RETENTION

064413
ARNOLD WD + CROUSE DJ
RADIOACTIVE CONTAMINATION OF OIL PRODUCED FROM NUCLEAR-BROKEN SHALE
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
1 PAGE, PG. 46, PAPER PRESENTED AT THE SYMPOSIUM ON ENGINEERING WITH NUCLEAR EXPLOSIVES, CONF. 700101, JANUARY 14-16, 1970

THE RESULTS OF SMALL-SCALE EXPOSURE AND RETORTING TESTS INDICATED THAT OIL RECOVERED FROM SHALE BROKEN WITH NUCLEAR EXPLOSIVES WILL BE CONTAMINATED WITH TRITIUM. WHEN OIL SHALE WAS HEATED IN SEALED FLASKS WITH TRITIATED WATER VAPOR, THE SHALE AND THE OIL SUBSEQUENTLY RETORTED FROM THE SHALE-CONTAINED TRITIUM. THE TRITIUM CONTAMINATION INCREASED WITH INCREASE IN EXPOSURE TEMPERATURE AND WITH INCREASE IN TRITIUM CONCENTRATION IN THE WATER DURING EXPOSURE.

*GEOLOGY + *NUCLEAR DETONATION + *CONTAMINATION + CONCENTRATION + TEMPERATURE

064785
DROBINSKI JC + LAGATTA DP + GOLDIN AS + TEPRILL JG
ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM
NORTHEASTERN RADIOLOGICAL HEALTH LABORATORY, DIVISION OF RADIOLOGICAL HEALTH, PUBLIC HEATLH SERVICE, WINCHESTER, MASSACHUSETTS
11 PAGES, 8 FIGURES, 4 TABLES, 35 REFERENCES, HEALTH PHYSICS, VOL. 11, PP. 385-395 (1965)(T1785)

1952 OFTEN USED AS BENCH-MARK FOR ASSESSING C14 LEVELS (START OF HIGH YIELD DEVICE TESTING), PRE-1952 BASELINE ESTIMATED AT 14 +-1 D/MIN/GM OF C IN BIOSPHERE, NSIC NO. 64786. MENEELY (1962) REPORTED 65% INCREASE OVER BACKGROUND (23 D/MIN/GM C) AS OF 1958. ASSUMING CESSATION OF ALL TESTING IN WORLD, SEVERAL CENTURIES WILL BE REQUIRED FOR ENVIRONMENTAL LEVELS TO RETURN TO PRE-1952 BACKGROUND, WHICH MAY OR MAY NOT BE OF GENETIC SIGNIFICANCE TO THE HUMAN RACE AND OTHER LIVING SYSTEMS. H3 LEVELS ARE MORE VARIABLE THAN C14, KAUFMAN (1953) REPORTING 3 TO 30 PCI/L AS PRE-1952 H3 LEVEL IN WATERS AND WINES, BIOSPHERE INCREASING TO 300 TO 50,000 PCI/L THEREAFTER, TRITIUM IN ATMOSPHERIC HYDROGEN GAS INCREASING FROM 430 PCI/GM OF HYDROGEN IN 1954 TO 29,000 IN 1962 (NSIC NO. 64787). FRC 3, 3(1962) CLAIMED THAT MUTATIONS EXPECTED FROM C14 OVER ALL TIME (THOUSANDS OF YRS) WILL BE GREATER THAN FOR ANY OTHER RADIONUCLIDE, BUT WITH FEWER MUTATIONS PER GENERATION. VALUES FOR BIOL HALF-LIFE OF C14 HAVE RANGED FROM 10 TO 180 DAYS, EXCLUSIVE OF THE 5% LONG-TERM COMPONENT IN BONE. BECAUSE OF SHORTER PHYSICAL HALF-LIFE, H3 NOT CONSIDERED AS HAZARDOUS AS C14. PRESENT STUDY GIVES C14 AND H3 CONTENTS OF CANNED MEATS, AND 14 CONTENTS OF HUMAN LIVER, KIDNEY, HEART, BLOOD AND OF MILK, EGGS, POTATOES, APPLIES, ORANGES AND OF AIR IN VARIOUS CITIES FOR 1962-4. DATA TOO DETAILED FOR LIMITED SPACE HERE.

CARBON + FALLOUT + INGESTION + INHALATION + AIR + MILK + DIETARY HABIT + WATER, DRINKING + *POPULATION EXPOSURE + CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + VEGETATION + CONCENTRATION + DISTRIBUTION + BLOOD + BONE + EGG + KIDNEY + LIVER + MAN + FOOD INTAKE + *EXPOSURE, BACKGROUND + HEART

064787
GROSSE AV + KIRSHENBAUM AD + KULP JL + BROECKER WS
NATURAL TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN (T1782)
RESEARCH INSTITUTE OF TEMPLE UNIVERSITY, PHILADELPHIA, PENNSYLVANIA + LAMONT GEOLOGICAL OBSERVATORY, COLUMBIA UNIVERSITY, PALISADES, NEW YORK
2 PAGES, 1 TABLE, 7 REFERENCES, PHYSICAL REVIEWS, VOL. 93, PP. 250-251 (1954)

CF 64785. BEFORE MAN ADVANCES TOO MANY DECADES INTO THE NUCLEAR AGE IT IS INCUMBENT ON HIM TO ESTABLISH A PRE-NUCLEAR BASELINE FOR FUTURE REFERENCE. NUCLEAR STIMULATION OF NATURAL GAS WELLS FOR EXAMPLE WILL INTRODUCE TRITIUM INTO INDUSTRIAL AND HOUSEHOLD GAS. GROSSE, SCIENCE 113, 1 (1951) FOUND NATURAL TRITIUM IN NORWEGIAN SURFACE WATERS BY ENRICHING THE NATURAL H3 CONTENT 1 TO 10 MILLION FOLD ELECTROLYTICALLY. FELTINGS, Z NATURFORSCH 5A, 438 (1950) ASSUMED THAT THE MOLECULAR HYDROGEN IN AIR (0.5 PPM) CONTAINS MUCH HIGHER CONCN OF COSMIC-RAY TRITIUM THAN ATMOSPHERIC WATER. PRESENT AUTHORS EXAMINED TRITIUM CONTENT OF MOLECULAR HYDROGEN FROM GROUND-LEVEL AIR USING 25 CC OF WATER PRODUCED FROM ATMOSPHERIC HYDROGEN IN THE NE-HE FRACTION OF AIR AT BUFFALO, NY, CORRESPONDING TO 60 TO 70 MILLION LITERS OF AIR (LINDE AIR PRODUCTS CO). SAMPLES ENRICHED ABOUT 7 TIMES ELECTROLYTICALLY GAVE AN AVERAGE T/H RATIO FO 16,600 X (EXP + 18) CORRECTED FOR DECAY. LIBBY FOUND TRITIUM CONTENT OF MOLECULAR HYDROGEN ABOUT 1000 TIMES GREATER THAN FOR WATER IN CONTACT WITH THE HYDROGEN. FIREMAN, PHY REV 91, 922 (1953), CALCD TOTAL H3 FORMATION RATE TO BE 0.4 TO 0.9 H3 ATOM/M2 OF EARTH SURFACE/SEC.

PLOWSHARE + AIR + POPULATION EXPOSURE + RADIATION, PUBLIC EDUCATION + MONITOR, NUCLEAR DETONATION + GAS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOMASS + PHYSIOLOGY/METABOLISM + *EXPOSURE, BACKGROUND

064889
A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS
CONF-701106 +. 18 PAGES, PROCEEDINGS OF THE 5TH ANNUAL HEALTH PHYSICS SOCIETY MIDYEAR SYMPOSIUM, VOLUME II, PG. 266-277, (NOVEMBER 1970)

LABORATORY OPERATIONS AT BROOKHAVEN SINCE ITS ESTABLISHMENT IN 1949 HAVE INCLUDED THE ROUTINE RELEASE TO THE ENVIRONMENT OF GASEOUS, HALOGEN, AIR PARTICULATE, AND H-3 RADIOACTIVITY IN REACTOR AIR EFFLUENTS AND OF BETA-GAMMA EMITTERS AND H-3 IN LOW-LEVEL LIQUID WASTES IN AMOUNTS COMPARABLE TO CURRENT RELEASES FROM POWER REACTORS. PAST AND CURRENT SURVEILLANCE DATA AT BNL HAVE BEEN EVALUATED FOR SHORT- AND LONG-TERM CHANGES IN RADIATION LEVELS ATTRIBUTABLE TO THESE OPERATIONS. *** ON THE BASIS OF THESE DATA, IT IS CONCLUDED THAT FEW CHANGES IN BACKGROUND SHOULD BE APPARENT, EVEN AFTER LONG-TERM OPERATION OF NUCLEAR POWER REACTORS.

EFFLUENT + PARTICLE + BETA EMITTER + *REACTOR, POWER + AIR + *BNL + *RADIOACTIVITY RELEASE + GAMMA EMITTER + GAS + LIQUID + *OPERATING EXPERIENCE + *DATA COLLECTION + *COMPARISON + EXPOSURE, BACKGROUND

065472
SMITH JM + GILBERT RS
TRITIUM EXPERIENCE IN BOILING WATER REACTORS
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
2 PAGES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 14(1), PAGES 160-161 (1971)

DUE TO THE LOW TRITIUM CONCENTRATIONS IN A BWR, KNOWLEDGE OF THE RELATIVE CONTRIBUTIONS FROM THE VARIOUS SOURCES THAT APPEAR IN REACTOR WATER IS GAINED ONLY BY INFERENCE. AUDIT OF 1970 OPERATIONS AT OYSTER CREEK INDICATED ABOUT 22 CI OF TRITIUM IN LIQUID EFFLUENTS. BASED ON OPERATING HISTORY, THE SOURCES ARE ESTIMATED TO BE 4 CI FROM DEUTERIUM IN REACTOR WATER, 6000 CI IN FUEL FROM FISSION, AND 2000 CI IN CONTROL MATERIAL, DURING THE YEAR. BY INFERENCE, IT APPEARS THAT ONLY A FEW-TENTHS OF ONE PERCENT OF THE COMBINED FISSION AND CONTROL MATERIAL SOURCE IS TRANSFERRING TO REACTOR WATER. THIS EXPERIENCE INDICATES THAT OPERATION OF LARGE BOILING WATER REACTORS WILL CONTINUE TO PRODUCE INSIGNIFICANT RADIATION EXPOSURES FROM TRITIUM, BOTH IN PLANT AND IN THE ENVIRONS.

AVAILABILITY - JAMES M. SMITH, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

*REACTOR, BWR + *PRODUCTION

065493
COHEN P
RADIOACTIVITY AND ITS FRACTIONATION DURING UNDERGROUND SHOTS IN A GRANITE MEDIUM
COMMISSARIAT A L'ENERGIE ATOMIQUE, PARIS, FRANCE
STI/PUB-273 + CONF-700305 +. 11 PAGES, PP. 211-220 OF THE PROCEEDINGS OF A PANEL ON THE PEACEFUL USES OF NUCLEAR EXPLOSIONS HELD IN VIENNA, MARCH 2-6, 1970

RESULTS ARE PRESENTED ON SAMPLES OBTAINED FROM UNDERGROUND SHOTS IN THE SAHARA. SAMPLING METHODS FOR GASES AND SOLIDS ARE DESCRIBED. THE EVOLUTION OF THE RADIOACTIVE COMPOSITION OF THE GASES AS A FUNCTION OF SAMPLING TIMES AND SITES IS DISCUSSED (TRITIUM, AR-37, FISSION GAS). CERTAIN ACTIVATION PRODUCTS HAVE BEEN DETERMINED (TRITIUM, CA-45, AR-37). THE HOMOGENEITY OF FISSION PRODUCTS AND FISSIONABLE MATERIALS IN VITRIFIED SAMPLES HAS BEEN CONFIRMED IN GRANITE, THE VITRIFIED MASS OF WHICH IS 1300 T/KT.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

CALCIUM + FISSION GAS RELEASE + *PLOWSHARE + ACTIVATION PRODUCT + ARGON + *SAMPLING + *NUCLEAR DETONATION + ISOTOPIC FRACTIONATION + EXCAVATION, NUCLEAR + *GAS + *SOLID

065603
THERMONUCLEAR DIVISION, ANNUAL PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1970
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-4688 +. 127 PAGES, FIGURES, TABLES, REFERENCES, AUGUST, 1971

EXTENSIVE PROGRESS REPORT. SAFETY-RELATED ITEMS - ENVIRONMENTAL IMPACT (NEUTRON-INDUCED RADIOACTIVITY, TRITIUM), RADIATION DAMAGE, TRITIUM BREEDING AND RECOVERY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

RADIATION DAMAGE + RADIOACTIVITY RELEASE + RADIONUCLIDE, INDUCED + *REACTOR, THERMONUCLEAR

065652
LANGHAM WH
BIOLOGICAL CONSIDERATIONS OF NONNUCLEAR INCIDENTS INVOLVING NUCLEAR WARHEADS
CALIFORNIA UNIVERSITY, LIVERMORE, LAWRENCE RADIATION LABORATORY
UCRL-50639 +. 38 PAGES, APRIL 1969

MATERIALS FREQUENTLY USED IN NUCLEAR WARHEADS ARE RECOGNIZED TO BE TOXIC. IN THE EVENT OF A NONNUCLEAR INCIDENT INVOLVING A WARHEAD, SOME OF THESE MATERIALS MAY BE RELEASED. PERTINENT PHYSICAL, CHEMICAL, AND RADIOLOGICAL PROPERTIES OF THESE MATERIALS ARE PRESENTED. PREDICTION OF EXPOSURE AND CONTAMINATION LEVELS AND EVALUATION OF BIOLOGICAL CONSEQUENCES OF SUCH AN INCIDENT ARE SUMMARIZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BERYLLIUM + *DEPOSITION + *INGESTION + *INHALATION + PLUTONIUM + HAZARD, RELATIVE + URANIUM + ACCIDENT, HYPOTHETICAL + *INCIDENT, NONNUCLEAR + METEOROLOGY + MILITARY CONSIDERATION + ABSORPTION + BIOCHEMICAL + *TOXICITY + *RADIATION EFFECT + LIVER + LUNG + LYMPH NODE + SKIN + TUMOR + BIOLOGICAL CONTROL

065953
WRIGHT JH
ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS
4 PAGES, J. INST. NUCL. ENG., 12, PAGE 8-12, (JAN-FEB. 1971)

RADIATION EFFECTS EVEN IN A REGION CONTAINING NUCLEAR PLANTS ON 32-KM CENTER TO CENTER LOCATIONS ARE STILL QUITE NEGLIGIBLE. INFORMATION ON THE RADIONUCLIDE RELEASE IN LIQUID AND GASEOUS EFFLUENTS SHOULD BE COLLECTED TO ASSESS THE FUTURE ENVIRONMENTAL RADIONUCLIDE DISTRIBUTION, ALTHOUGH THERE IS NO SHORT RANGE PROBLEM FROM BUILD-UP IN THE BIOSPHERE. THE MANAGEMENT OF KRYPTON AND TRITIUM SHOULD BE MODIFIED WITHIN THE NEXT TWO DECADES.

*KRYPTON + REACTOR, PWR + RADIATION IN PERSPECTIVE + WASTE DISPOSAL, ATMOSPHERIC + *BIOTA + WASTE DISPOSAL, RIVER + *RADIONUCLIDE UPTAKE + N-POWER FORECAST

066363
GOLLD RW
PROGRESS IN CONTROLLED THERMONUCLEAR RESEARCH
US ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
A/CONF.-49/P-036 +. 17 PAGES, 10 FIGURES, 34 REFERENCES, 3 TABLES, PAPER PRESENTED AT THE FOURTH UNITED NATIONS INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, PP. 1-17, SEPT. 16, 1971

THE OBJECTIVE OF CONTROLLED THERMONUCLEAR RESEARCH IS TO PROVIDE A NEW AND DIFFERENT KIND OF ENERGY SOURCE. THE REQUIREMENTS FOR ACHIEVING USEFUL POWER FROM CONTROLLED THERMONUCLEAR REACTIONS ARE (A) TO HEAT A DILUTE GAS OF FUSION FUEL TO TEMPERATURES OF HUNDREDS OF MILLIONS OF DEGREES WHERE IT IS IN THE PLASMA STATE, (B) TO CONTAIN IT FREE FROM ANY CONTACT WITH MATERIAL WALLS OR FROM CONTAMINATION BY IMPURITIES LONG ENOUGH FOR A SIGNIFICANT FRACTION OF THE FUEL TO REACT, AND FINALLY (C) TO EXTRACT THE ENERGY RELEASED AND CONVERT IT TO A USEFUL FORM. PROGRESS TOWARD THIS APPLIED GOAL HAS BEEN CRITICALLY DEPENDENT UPON OUR KNOWLEDGE OF THE BEHAVIOR OF HIGH TEMPERATURE PLASMAS, TOGETHER WITH THE MEANS OF HEATING AND CONFINING THEM. DURING THE PAST FEW YEARS WE HAVE BEGUN TO REAP THE REWARDS OF INVESTMENTS IN FUNDAMENTAL STUDIES, AND PROGRESS ON (A) AND (B) HAS BEEN SUBSTANTIAL. THIS PAPER DESCRIBES THE RECENT PROGRESS IN THE UNITED STATES CONTROLLED THERMONUCLEAR RESEARCH PROGRAM.

AIRBORNE RELEASE + HAZARDS ANALYSIS + *RADIATION SAFETY AND CONTROL + ENVIRONMENT + *SYSTEM DESCRIPTION + *R AND D PROGRAM + FORECAST + *REACTOR, THERMONUCLEAR + RADIATION EFFECT

066435
GRIMES WR + BOHLMANN EG + WATSON GM
REACTOR CHEMISTRY DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING MAY 31, 1971
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-4717 +. 141 PAGES, AUGUST 1971

DEALS WITH MOLTEN SALT CHEMISTRY, CHEMICAL BEHAVIOR OF MOLTEN SALT REACTOR EXPERIMENT, MOLTEN SALT BREEDER STUDIES, SPECIAL STUDIES, AQUEOUS STUDIES, CHEMICAL SUPPORT FOR HIGH TEMPERATURE GAS-COOLED REACTORS, NUCLEAR SAFETY, SALT MINE REPOSITORY, SPECIAL RESEARCHES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

066435 *CONTINUED*
GRAPHITE + NOBLE GAS + *FISSION PRODUCT TRANSPORT + *MOLTEN FUEL + *CORROSION + *WASTE DISPOSAL, SALT + FLUORIDE

066877
ARNOLD WD + CROUSE DJ
RADIOACTIVE CONTAMINATION OF COPPER RECOVERED FROM ORES FRACTURED WITH NUCLEAR EXPLOSIONS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-4677 +. 55 PAGES, 20 FIGURES, 8 TABLES, 13 REFERENCES, SEPTEMBER 1971

RESULTS OF LABORATORY TESTS SIMULATING THE PROCESSING OF COPPER ORE AFTER FRACTURING WITH NUCLEAR EXPLOSIVES INDICATE THAT ONLY VERY SMALL FRACTIONS OF THE RADIOACTIVE FISSION PRODUCTS AND NEUTRON ACTIVATION PRODUCTS WILL BE DISSOLVED ON LEACHING WITH SULFURIC ACID. TRITIUM (AS TRITIATED WATER) WILL BE, BY FAR, THE DOMINANT RADIONUCLIDE IN THE CIRCULATING LEACH LIQUOR, ASSUMING USE OF A FUSION DEVICE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + MINING + TESTING + *ACTIVATION PRODUCT + *COPPER + *NUCLEAR DETONATION + CONTAMINATION + NEUTRON + SIMULATION + *ORE CONVERSION + *LEACHING + ACID + BENEFICIAL USE

067566
TUCK JL
OUTLOOK FOR CONTROLLED FUSION POWER
UNIVERSITY OF CALIFORNIA, LOS ALAMOS SCIENTIFIC LABORATORY
7 PAGES, NUCLEAR ENGINEERING INTERNATIONAL, 16(186), PP. 924-930 (NOVEMBER 1971)

EXCELLENT SURVEY OF PROSPECTS. DESCRIBES THE SEVERAL APPROACHES, PRESENTS ADVANTAGES AND DISADVANTAGES OF EACH. POINTS OUT CLOSE CONNECTION BETWEEN FUSION-PRODUCED POWER AND THE HELIUM SUPPLY FOR COOLING SUPERCONDUCTING WIRE USED IN MAGNETS COILS. BY ASSUMING A REASONABLE NUMBER OF FUSION POWER REACTIONS BY YEAR 2010, THE REACTORS WILL REQUIRE A HELIUM INVENTORY OF 2.6 X 10(10TH) CUBIC FEET. THE U.S. RESERVE IS ONLY 1.3 X 10(11TH) CUBIC FEET. SAYS THAT THE AMOUNT OF HELIUM PRODUCED IN THE FUSION REACTORS IS NEGLIGIBLE. WOULD LIKE PRESENT CONSUMPTION OF HELIUM TO BE REDUCED THROUGH HIGHER PRICE, AND WOULD IMPOSE A HEARTY TAX ON RELEASE OF HELIUM INTO THE ATMOSPHERE AFTER USE. HELIUM SEEMS TO BE THE KEY TO WIDESPREAD USE OF THERMONUCLEAR FUSION ONCE THE PROCESS BECOMES TECHNOLOGICALLY SOUND.

EXPLOSION + FIRE + HELIUM + RADIONUCLIDE, INDUCED + SAFETY EVALUATION + *FORECAST + *REACTOR, THERMONUCLEAR

067891
FOLSOM TR
NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS
SCRIPPS INSTITUTION OF OCEANOGRAPHY, LA JOLLA, CALIFORNIA
TID-25774 +. 16 PAGES, MARCH 15, 1971

GIVES AN EXAMPLE OF THE LIMITED AND SOMEWHAT BIASED INFORMATION THAT HAS BEEN PRESENTED TO A WATER-QUALITY-CONTROL BOARD BY A TYPICAL INVESTOR-OWNED POWER COMPANY. PRESENT REGULATIONS MAKE IT NECESSARY ONLY TO MONITOR CRUDELY THE ACTIVITY DISCHARGED--SUFFICIENT TO AVOID EXCEEDING STANDARDS, HARDLY APPROPRIATE FOR DESCRIBING ENVIRONMENTAL DAMAGE. A BETTER INSPECTION SHOWS THAT AT LEAST ONE NUCLIDE HAS ACCUMULATED IN AT LEAST TWO SPECIES. A SIMPLE CALCULATION SUGGESTS THAT THE MUCH LARGER AMOUNTS OF TRITIUM COMING FROM THIS PLANT PROBABLY HAS ALREADY ALTERED LARGE AREAS OF THE COASTAL OCEAN MEASURABLY. IN FACT, THIS RADIOACTIVE TAG MIGHT BE USEFUL TO INDICATE HOW THE OCEAN DISPOSES OF OTHER COASTAL POLLUTIONS. THESE ACTIVITIES CERTAINLY MUST NOW BE TAKEN INTO CONSIDERATION AS BACKGROUNDS--BY SCIENTISTS AT LEAST.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*CODES AND STANDARDS + *EFFLUENT + REACTOR, PWR + *WASTE DISPOSAL, OCEAN + *SAN ONOFRE 1 (PWR) + MONITOR, ENVIRONMENTAL + *REGULATION, AEC + REACTOR POWER + RADIOACTIVITY RELEASE + RADIOISOTOPE + *SURVEILLANCE PROGRAM + REGULATION, FEDERAL + CONCENTRATION + OCEAN, PACIFIC

067892
ARNOLD WD + CROUSE DJ
CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE) - PROGRESS REPORT FOR APRIL 1 TO JUNE 30, 1971
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-TM-3541 +. 14 PAGES, 2 REFERENCES, 2 FIGURES, 2 TABLES, SEPTEMBER 1971

TESTS SIMULATING THE STORAGE OF NATURAL GAS IN A CAVITY FORMED WITH NUCLEAR EXPLOSIVES SHOWED ESSENTIALLY NO TRITIATION OF METHANE WHEN STORED IN CONTACT WITH ROCK SALT OR LEWIS SHALE THAT WERE CONTAMINATED WITH TRITIATED WATER. THE GAS WAS SLIGHTLY CONTAMINATED WITH TRITIATED WATER VAPOR. MORE THAN 99% OF THE TRITIATED WATER WAS REMOVED FROM SALT OR LEWIS SHALE SAMPLES BEFORE GAS STORAGE BY FLOODING THE STORAGE VESSEL WITH WATER AND LESS EFFICIENTLY BY PURGING THE SYSTEM WITH AIR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DECONTAMINATION + *TESTING + *NUCLEAR DETONATION + CONTAMINATION + *STORAGE CONTAINER + SIMULATION + *GAS + *CONSUMER PRODUCT + BENEFICIAL USE, COMMERCIAL

068115
RETIEF JV + KRUGER P.
THE USE OF NUCLEAR EXPLOSIVES FOR WATER RESOURCES DEVELOPMENT IN ARID REGIONS
STANFORD UNIVERSITY, CALIFORNIA
SU-326-P-31-2 +. 108 PAGES, JUNE 1971

FEASIBILITY IS STUDIED IN RELATION TO THE HYDROLOGY OF ARID-REGIONS (VARIABLE PRECIPITATION, ERRATIC RUNOFF, HIGH EVAPORATION, SALINITY, AND LARGE SEDIMENT LOAD). GROUND SHOCK AND AIR BLAST MAY REQUIRE THAT THE CONSTRUCTION SITE BE LOCATED IN A REMOTE AREA. RADIATION CONTAMINATION MAY HAVE TO BE REMOVED BY SEVERAL CYCLES OF FLOODING AND DRAINING OF THE CRATER. CRATERS WITH A STORAGE CAPACITY LARGER THAN 10,000 ACRE FT CAN DELIVER WATER AT A PRICE LESS THAN $37/ACRE-FT, WHICH IS THE UPPER LIMIT OF PRICES OF IRRIGATION WATER. A 100,000 ACRE-FT RESERVIOR CAN DELIVER WATER AT A COST OF $14/ACRE-FT.

DECONTAMINATION + SURFACE WATER, NUCLIDE OCCURRENCE + NUCLEAR DETONATION + *WATER, IRRIGATION + *IMPOUNDMENT + RADIONUCLIDE UPTAKE + ECOSYSTEM, DESERT + *BENEFICIAL USE

068566
BARTON CJ + MOORE RE + HANNA SR
QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL EXPOSURES TO RULISON GAS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-3601 +. 38 PAGES, 7 FIGURES, 11 TABLES, 26 REFERENCES, OCTOBER 1971

DOSES THAT PEOPLE LIVING IN A NUMBER OF SMALL COLORADO COMMUNITIES WOULD HYPOTHETICALLY RECEIVE FROM USE OF RULISON NATURAL GAS WERE CALCULATED. PRODUCTION TESTING OF THE WELL HAS RESULTED IN REMOVAL OF MOST OF THE TRITIUM THAT WAS INITIALLY PRESENT IN THE CAVITY. THE MAXIMUM DOSE IN THE WSGC SYSTEM, WHICH AFFORDS LITTLE POTENTIAL DILUTION OF RULISON GAS, IS 39 MILLIREMS/YEAR. INHALATION AND SKIN ABSORPTION OF TRITIUM DISPERSED IN THE ATMOSPHERE GAVE WHOLE BODY DOSES ESTIMATED TO BE LESS THAN 1 MILLIREM/YEAR. WHOLE-BODY DOSES FROM KR-85 IN RULISON GAS ARE ESTIMATED TO BE ABOUT 1% OF THE TRITIUM DOSES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CODES AND STANDARDS + INHALATION + KRYPTON + PLOWSHARE + MONITOR, GAS + *RADIATION SAFETY AND CONTROL + *SAFETY EVALUATION + *GAS + *CONSUMER PRODUCT + ABSORPTION + *CONCENTRATION + BENEFICIAL USE, COMMERCIAL

068766
REPORT ON RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE, WASHINGTON, D.C.
9 PAGES, 4 TABLES, OCTOBER 1971

TABULATES RADIOACTIVITY RELEASED IN LIQUID AND GASEOUS EFFLUENTS FROM NUCLÉAR POWER PLANTS DURING 1970. NEW REACTORS WITH CAPACITY FACTORS OF LESS THAN 10% FOR 1970 WERE EXCLUDED. REVIEWS OF SAMPLING AND ANALYTICAL METHODS USED AT SOME FACILITIES WERE INAPPROPRIATE TO MEASURE TOTAL ACTIVITY. CORRECTIONS WERE MADE. THEREFORE SOME DATA ARE DIFFERENT FROM THOSE REPORTED BY THE UTILITIES. RADIOACTIVITY IN EFFLUENT RELEASES HAS BEEN GENERALLY LOW IN COMPARISON WITH PERMISSIBLE LIMITS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

REACTOR, BWR + FISSION GAS RELEASE + FISSION PRODUCT RELEASE + REACTOR, PWR + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + *RADIOACTIVITY RELEASE + REACTOR, HTGR

069594
TAYLOR GR + PETERS FE
TRITIUM TRANSPORT IN LMFBR'S
WESTINGHOUSE ADVANCED REACTORS DIVISION, PENNSYLVANIA
2 PAGES, 1 FIGURE, 1 TABLE, 3 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 15(1), PP. 431-432 (JUNE 1972)

PARAMETRIC ANALYSIS SHOWS TRITIUM RELEASE TO THE STEAM GENERATOR AT STEADY STATE VERSUS PRIMARY AND SECONDARY PURIFICATION RATES FOR A 1000-MW(E) LMFBR. A TABLE SHOWS THE RELATION BETWEEN TRITIUM RADIATION LEVELS AT THE SITE BOUNDARY, AS % MPC, AND RELEASE FROM A 300- AND 100-MW(E) LMFBR PLANT. THE AEC GUIDELINE FOR ALLOWABLE INTEGRATED DOSE AT THE SITE BOUNDARY FOR GASES FOR LWRS IS 10 MR/YEAR, WHICH IS 2% OF MPC. IT CAN BE SEEN FROM TABLE I THAT COLD TRAPPING IN THE 300-MW(E) PLANT WILL READILY CONTROL TRITIUM TO AN ORDER OF MAGNITUDE LESS THAN THIS. FURTHER DEVELOPMENTS MAY BE NECESSARY FOR TRITIUM CONTROL IN THE 1000-MW(E) PLANT.

AVAILABILITY - G. R. TAYLOR, WESTINGHOUSE ELECTRIC CORPORATION, ADVANCED REACTORS DIVISION, BOX 158, MADISON, PENNSYLVANIA 15663

*STEAM GENERATOR + *REACTOR, LMFBR

069928
MILLS RG
POTENTIAL ADVANTAGES OF FUSION POWER REACTORS

. 069928 *CONTINUED*
PRINCETON UNIVERSITY, NEW JERSEY
CONF-71111-33 +. 6 PAGES, FROM THE NUCLEAR SCIENCE SYMPOSIUM, SAN FRANCISCO, CALIFORNIA, NOVEMBER 3, 1971

CONCERNED NOT WITH THE DETAILS OF ANY PARTICULAR HYPOTHETICAL MODEL BUT RATHER WITH THE POTENTIAL ADVANTAGES OF A RESULTING SYSTEM. SHOWS A TYPICAL CROSS SECTION THAT MIGHT APPLY TO A VARIETY OF DEVICES. THE INNER VACUUM CHAMBER CONTAINS A LOW DENSITY (ABOUT 10 (EXP 15)) PLASMA OF HIGH TEMPERATURE FUSIBLE FUEL. BETWEEN THE VACUUM TUBE AND THE CONFINING FIELD COILS IS A BLANKET/SHIELD THAT MUST BREED TRITIUM IF TRITIUM IS CONSUMED IN THE REACTION, CONVERT THE ENERGY CARRIED BY THE NEUTRONS TO HEAT, AND SHIELD THE SUPERCONDUCTING COILS FROM NEUTRON AND GAMMA RAY ENERGY. THE HEAT GENERATED WOULD BE USED IN A HEAT ENGINE TO GENERATE ELECTRICITY. SUCH A SYSTEM WOULD HAVE A NUMBER OF ENVIRONMENTAL AND ECONOMIC ADVANTAGES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + HEAT SINK + HAZARDS ANALYSIS + WASTE MANAGEMENT + RELIABILITY, SYSTEM + *FORECAST + *REACTOR, THERMONUCLEAR + COST, CAPITAL

069957
JANSSEN U
NUCLEAR POWER PLANT EMISSIONS
5 PAGES, MITT. VER. GROSSKESSELBETR, 51(2): 143-7 (1971) (IN GERMAN)

THE BASIS FOR, AND DEVELOPMENT OF STATUTORY LIMITATIONS FOR THE RELEASE OF RADIOACTIVE EMISSIONS FROM NUCLEAR POWER PLANTS ARE DISCUSSED. THE ACTUAL EMISSION VALUES FOUND UNDER NORMAL CONDITIONS AND DURING EMERGENCIES ARE GIVEN. TRITIUM EMISSION IS USED TO ILLUSTRATE THE NEED FOR TRACING EMITTED RADIOACTIVE SUBSTANCES SO THAT POSSIBLE BIOLOGICAL ACCUMULATION CAN BE RECOGNIZED. (IN GERMAN)

*REACTOR, POWER + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RADIOACTIVITY RELEASE

070395
COHEN JJ + HIGGINS GH
SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT
LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-73182 + CONF-710809-14 +. 22 PAGES, FROM THE TRITIUM SYMPOSIUM LAS VEGAS, NEVADA, AUGUST 30, 1971

IN ACCORDANCE WITH CURRENT GUIDANCE, TRITIUM RELEASES MUST BE KEPT BELOW QUANTITIES WHERE MPC LEVELS ARE EXCEEDED, AND SHOULD BE KEPT AS LOW AS PRACTICABLE. DETERMINATION OF PRACTICABILITY REQUIRES AN ANALYSIS OF BENEFIT VERSUS RISK CONSIDERATIONS. SUCH AN ANALYSIS HAS BEEN PERFORMED FOR CERTAIN GENERAL CASES. IT IS BASED ON A MER VALUE OF $250 (A MER IS THE AMOUNT OF BENEFIT REQUIRED TO JUSTIFY A RADIATION EXPOSURE OF ONE MAN-REM) AND CONSIDERS THE NATURE OF TRITIUM DISTRIBUTION IN THE BIOSPHERE AS WELL AS CERTAIN DEMOGRAPHIC FACTORS. IT ALSO ASSUMES THAT CONSTRAINTS IMPOSED BY EXPOSURE GUIDES ARE OBSERVED. THE ASSUMPTIONS AND CALCULATIONS ARE REVIEWED IN DETAIL. THE POSSIBLE SOCIAL AND MORAL IMPLICATIONS OF SUCH AN ANALYSIS ARE ALSO DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MPC + RADIATION IN PERSPECTIVE + RADIOACTIVITY RELEASE + ENVIRONMENT + RADIATION EXPOSURE + BENEFIT VS RISK + SOCIO/PHILOSOPHICAL CONSIDERATION

072136
RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE
EUROPEAN NUCLEAR ENERGY AGENCY, FRANCE
126 PAGES, PARIS, EUROPEAN NUCLEAR ENERGY AGENCY, 1971

THE PRINCIPLES AND PRACTICES APPLIED TO RADIOACTIVE WASTE MANAGEMENT IN WESTERN EUROPE ARE REVIEWED. THE ORIGIN AND DIFFERENT TYPES OF RADIOACTIVE WASTES ARE DISCUSSED, AND DATA ON THE PRODUCTION OF GASEOUS, LIQUID, AND SOLID RADIOACTIVE WASTES IN WESTERN EUROPE DURING 1970 ARE PRESENTED. THE GENERAL SAFETY, TECHNICAL, AND ECONOMIC ASPECTS OF WASTE MANAGEMENT ARE REVIEWED. SPECIFIC TREATMENT AND STORAGE PRACTICES AT VARIOUS EUROPEAN NUCLEAR FACILITIES AND THE OUTSTANDING WASTE MANAGEMENT PROBLEMS, NOTABLY SAFE PERMANENT STORAGE OF HIGH-LEVEL LIQUID WASTES AND THE CONTROL OF 85KR AND TRITIUM RELEASES TO THE ATMOSPHERE, ARE DESCRIBED.

*KRYPTON + SAFETY REVIEW + *WASTE DISPOSAL + *WASTE STORAGE + WASTE DISPOSAL, ECONOMICS + *WASTE MANAGEMENT + RADIATION SAFETY AND CONTROL + GAS + LIQUID + SOLID + PRODUCTION.

072213
HUNZINGER W
ESTIMATION OF TRITIUM DISCHARGES INTO LLW-STREAMS
EUROPEAN COMPANY FOR CHEMICAL PROCESSING OF IRRADIATED FUEL, MOL, BELGIUM
EUROCHEMIC-TR-267 + NP-18737 +. 17 PAGES, NOVEMBER 1970

THE TRITIUM TRANSFERRED AS LLW TO THE CEN WASTE TREATMENT STATION AND DISCHARGED TO THE MOL NETHE DURING THE PERIOD JANUARY 1969 - JULY 1970 WAS COMPARED WITH THE CALCULATED AMOUNT OF H-3 PRODUCED BY FISSION. THE DISCHARGES ARE BETWEEN 40 AND 80% OF THE CALCULATED QUANTITIES, IF SOURCES OF H-3 PRODUCTION OTHER THAN FISSION ARE NEGLECTED AND A PRODUCTION RATE OF 16 MCI/MWD FROM FISSION OF U-235 AND 22 MCI/MWD FROM FISSION OF PU-239 IS ASSUMED. THE TIME DELAY BETWEEN

072213 *CONTINUED*
FUEL DISSOLUTION AND ARRIVAL OF THE TRITIUM IN THE RIVER DOES NOT EXCEED 2 MONTHS.

FUEL BURNUP + PLUTONIUM + *WASTE TREATMENT, LIQUID + *FUEL REPROCESSING

072363
BRIGGS RB
TRITIUM IN MOLTEN-SALT REACTORS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
8 PAGES, 1 FIGURE, 3 TABLES, 15 REFERENCES, REACTOR TECHNOLOGY, 14(4), PP. 335-342 (WINTER 1971-1972)

MOLTEN-SALT BREEDER REACTORS ARE EXPECTED TO GENERATE TRITIUM AT A RATE OF ABOUT 1 CI/MWD(T). NEUTRON REACTIONS WITH LITHIUM, AN ESSENTIAL INGREDIENT OF A BREEDER FUEL SALT, ARE THE MAJOR SOURCE OF THE TRITIUM. AT 800 TO 1300 F, THE OPERATING TEMPERATURE RANGE OF MOLTEN-SALT REACTORS, TRITIUM DIFFUSES THROUGH THE METAL WALLS OF THE REACTOR EQUIPMENT AND PIPING INTO THE SURROUNDINGS. MEASUREMENTS OF THE TRITIUM DISTRIBUTION IN THE MOLTEN-SALT REACTOR EXPERIMENT (MSRE) INDICATED THAT ABOUT 20% OF THE TRITIUM ESCAPED FROM THE REACTOR SYSTEMS IN THIS WAY. SEVERAL MODIFICATIONS IN PLANT DESIGN, OR IN OPERATING CONDITIONS, HAVE THE POTENTIAL FOR CONFINING SUBSTANTIALLY ALL THE TRITIUM TO THE REACTOR SYSTEMS AND CONTAINMENT CELLS. RESEARCH IS IN PROGRESS TO PROVIDE THE DATA NECESSARY TO DESIGN A PLANT FOR SUITABLE CONTAINMENT AND DISPOSAL OF THE TRITIUM.

FUEL BURNUP + REACTOR, MOLTEN SALT + MSRE (RE) + *MOLTEN FUEL + MSBR (RE)

072593
RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE
EUROPEAN NUCLEAR ENERGY AGENCY
126 PAGES, 3 FIGURES, 4 TABLES, SEPTEMBER 1971

A SIMPLIFIED GENERAL REVIEW OF PRACTICES APPLIED TO MANAGEMENT OF RADIOACTIVE WASTES IN WESTERN EUROPE. BUT THE COMPLEXITY AND THE MAGNITUDE OF THE PROBLEM IS INDICATED BY HAVE PROVED MANAGEABLE AND AT A VERY HIGH STANDARD OF SAFETY FOR THE PERSONNEL AND THE ENVIRONMENT. MEANS ARE PROVIDED WHEREBY PUBLIC-HEALTH AUTHORITIES MAY REGULATE, IN THE PUBLIC INTEREST, RADIOACTIVE WASTE MANAGEMENT. THE WHOLE SCOPE OF WASTE-MANAGEMENT PRACTICES ARE DISCUSSED AND ENCOURAGEMENT GIVEN FOR PERIODIC REVIEW TO MAINTAIN THE HIGH STANDARDS OF ENVIRONMENTAL AND PUBLIC PROTECTION.

AVAILABILITY - EUROPEAN NUCLEAR ENERGY AGENCY

*ADMINISTRATIVE CONTROL + *CODES AND STANDARDS + ELEMENTS AND ISOTOPES + KRYPTON + REGULATION + *WASTE DISPOSAL + WASTE STORAGE + *WASTE TREATMENT + *ENEA + REACTOR, POWER + *WASTE MANAGEMENT + ICRP + RADIOISOTOPE + FUEL REPROCESSING

072991
KONIG LA
ENVIRONMENTAL BURDENING BY TRITIUM
KERNFORSCHUNGSZENTRUM, KARLSRUHE, GERMANY
KFK-1560 +. 24 PAGES, 7 FIGURES, 38 REFERENCES, FEBRUARY 1972

REVIEWS PRESENT KNOWLEDGE WITH RESPECT TO THE TRITIUM BURDEN ON THE ENVIRONMENT. FOLLOWING A COMPILATION OF THE MOST IMPORTANT CHARACTERISTICS THE THEORETICAL RELATIONSHIP BETWEEN TRITIUM INCORPORATION AND RADIATION BURDEN IS DEALT WITH. SOURCES OF ENVIRONMENTAL TRITIUM CONTAMINATION ARE THE TRITIUM PRODUCED BY NATURE AND IN NUCLEAR FISSION REACTORS, THE USE OF TRITIUM-CONTAINING LUMINOUS COLOURS, AND, ABOVE ALL, THE NUCLEAR WEAPON TESTS. THE TRITIUM RELEASED UNDERGOES A WORLDWIDE SPREAD BY THE CIRCULATING WATER. THE RADIATION BURDEN DUE TO THIS TRITIUM CONTAMINATION AND EVALUATED BY CONCENTRATION MEASUREMENTS AMOUNTS PRESENTLY TO 0.1 MREM/A.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FALLOUT + FISSION PRODUCT RELEASE + MEASUREMENT + SOURCE, RADIATION + *TEST, WEAPONS + *FISSION PRODUCT TRANSPORT + REACTOR, POWER + *CONTAMINATION + *ENVIRONMENT + *SAFETY EVALUATION + *CONCENTRATION

074325
HICKMAN RG
SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
UCRL-74057(REV.2) + CONF-721111-11 +. 48 PAGES, PAPER PRESENTED AT THE INTERNATIONAL MEETING ON THE TECHNOLOGY OF CONTROLLED THERMONUCLEAR FUSION EXPERIMENTS AND THE ENGINEERING ASPECTS OF FUSION REACTORS, HELD IN AUSTIN, TEXAS ON NOVEMBER 20, 1972

A NUMBER OF PROBLEMS ASSOCIATED WITH THE USE OF TRITIUM IN FUSION REACTORS ARE YET TO BE CONSIDERED. SOME ARE PECULIAR TO MIRROR MACHINES AND ATTEMPTS AT DIRECT CONVERSION OF PLASMA ENERGY TO ELECTRICITY, WHILE OTHERS ARE OF GENERAL CONCERN. SEVERAL OF THESE ARE CONSIDERED FROM THE POINT OF VIEW OF ONE WHO HAS WORKED WITH TRITIUM FOR SEVERAL YEARS. SPECIFIC AREAS MENTIONED INCLUDE LIQUIED-PHASE MASS TRANSFER OF TRITIUM IN LIQUID LITHIUM, ISOTOPIC SEPARATION, PRELIMINARY CALCULATIONS ON PERMEATION BARRIERS, ISOTOPIC SWAMPING, AND SOME THOUGHTS ON MAINTENANCE.

AVAILABILITY - NST

074325 *CONTINUED*
*ELECTRIC POWER + LITHIUM + PLASMA + *REACTOR, THERMONUCLEAR

074326
HORSKI J
PREPARATION OF TRITIUM GAS, TRITIATED WATER, AND TRITIUM TARGETS
INSTITUTE OF NUCLEAR RESEARCH, WARSAW, POLAND
INR-1396 +. 42 PAGES, FIGURES, 1972

A METHOD FOR PRODUCTION OF TRITIATED WATER AND TRITIUM-TITANIUM OR TRITIUM-ZIRCONIUM TARGETS WAS ELABORATED. THE METHOD CONSISTS IN - ACTIVATION OF LITHIUM-ALUMINIUM ALLOY, SEPARATION OF TRITIUM BY HEATING AND OXICATION ON THE CUO TO TRITIATED WATER OR ABSORPTION OF TRITIUM ON TITANIUM OR ZIRCONIUM. THE EXPERIMENT WAS CARRIED OUT IN TRITIUM AND CARBONIUM-14 LABORATORY OF RADIOISOTOPES PRODUCTION AND DISTRIBUTION CENTRE OF THE INSTITUTE OF NUCLEAR RESEARCH IN ZWIERK, IN THE YEARS 1967-71. (IN POLISH)

*PRODUCTION + *RADIONUCLIDE UPTAKE

074536
KIRCHMANN R + VAN DEN HOEK J
TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN
CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE, MOL, BELGIUM
10 PAGES, J. BELGE RADIO., 55(2), PP. 233-242 (1972)

TRITIUM IN THE ENVIRONMENT ORIGINATES FROM NATURAL AND ARTIFICIAL SOURCES: THE NATURAL PRODUCTION RATIO (INTERACTION, COSMIC RAYS ON NITROGEN AND OXYGEN IN THE AIR) AND THE ARTIFICIAL PRODUCTION RATIO (NUCLEAR BOMB EXPLOSIONS, POWER REACTORS) ARE INDICATED. DATA ON THE MOVEMENT OF TRITIUM IN THE ENVIRONMENT AND ESTIMATES OF TRITIUM PRODUCTION AND RELEASE BY NUCLEAR INSTALLATIONS ARE GIVEN AND BRIEFLY COMMENTED ON. THE WAYS IN WHICH PLANT-LIFE IS CONTAMINATED ARE NUMEROUS (ABSORPTION BY ROOT OR LEAF, VAPOUR EXCHANGE) AND THE MECHANISM RESPONSIBLE FOR TRITIUM INCORPORATION IN PLANT ORGANIC MATTER IS THAT OF PHOTOSYNTHESIS.

*POPULATION EXPOSURE + CONTAMINATION + RADIOACTIVITY RELEASE + *ABSORPTION + *RADIONUCLIDE UPTAKE + CONCENTRATION + *FOOD CHAIN + *RADIONUCLIDE TRANSFER + VAPOR EXCHANGE

074978
BOOTH LA
CENTRAL STATION POWER GENERATION BY LASER DRIVEN FUSION
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
50 PAGES, 6 TABLES, 29 FIGURES, NUCLEAR ENGINEERING AND DESIGN, 24(3), PP. 263-313 (MARCH 1973)

FEASIBILITY OF LASER-DRIVEN FUSION PULSES FOR ELECTRIC POWER GENERATION INVESTIGATED. OUTLINES WETTED WALL CONCEPT AND PHENOMENA WITHIN EXPLOSIVE CAVITY. HEAT REMOVAL AND FLOW PROBLEMS DISCUSSED. STRUCTURAL WALL RESPONSE TO CYCLE STRESSES EXAMINED. SUMMARIZES NEEDS FOR FURTHER STUDY AND COMPARES THIS CONCEPT WITH MAGNETIC CONFINEMENT PLANTS. DISCUSSES ECONOMIC, SAFETY, AND FEASIBILITY ASPECTS.

STRESS ANALYSIS + FAILURE, FATIGUE + REACTOR, PULSED + LASER + PRESSURE PULSE + REACTOR, THERMONUCLEAR

075295
BARRY PJ + MARKO AM + OPHEL IL + WILSON R
SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA
CHALK RIVER NUCLEAR LABORATORIES, ONTARIO
AECL-4165 +. 82 PAGES, 3 FIGURES, 14 TABLES, 22 REFERENCES, APRIL 1972

EIGHT PAPERS AND TALKS ARE INCLUDED, SOME OF WHICH WERE PUBLISHED PREVIOUSLY. TOPICS INCLUDE NUCLEAR WASTES, BIOLOGICAL UPTAKE, DOSE LIMITS, AND AMOUNTS OF RADIOACTIVITY RELEASED FROM 3 REACTORS DURING 1967-1971. THE CLOSED CYCLES USED TO REDUCE HEAVY-WATER LOSSES REDUCE ESCAPE OF GASEOUS RADIOISOTOPES. MOLECULAR SIEVE DRIERS REMOVE BOTH HEAVY WATER AND TRITIATED WATER, AND PROVIDE DELAY IN THE RELEASE OF NOBLE-GAS RADIOISOTOPES. WHETHER IODINE IS RETAINED IS NOT YET KNOWN.

CANADA + DOSE + IODINE + MOLECULAR SIEVE + NOBLE GAS + RELEASE RATE + *WASTE TREATMENT + CRITICAL NUCLIDE PATHWAY + ENVIRONMENT + *CONTAINMENT LEAKAGE CONTROL + THERMAL POLLUTION + ABSORPTION + *RADIONUCLIDE UPTAKE + FOOD CHAIN + DRY

075431
SCIENTISTS SHOW INDEXES OF POLLUTION
2 PAGES, CHEMICAL AND ENGINEERING NEWS, PP. 33, 35 (JANUARY 10, 1972)

AT AAAS MEETING IN PHILADELPHIA, AN ESSENTIAL STEP IN CUTTING THROUGH THE UNCERTAINTIES IN POLLUTION IS SOMEHOW TO GET NUMBERS INTO THE PICTURE. ONE SPEAKER STATED -- WE HAVE BEEN SO WASTEFUL OF OUR RESOURCES (NATURAL, HUMAN, ECONOMIC) THAT IT IS NOW NECESSARY TO ASSIGN SOME PRIORITIES TO THE PROBLEM IN ORDER TO ATTEMPT TO MINIMIZE THE DISRUPTION (IN TAKING ACTION). THE SIZE AND VAGUENESS OF POLLUTION MAKES EVEN CATEGORIES FOR ANALYSIS DIFFICULT TO DECIDE. RESULTS OF 3 STUDIES ARE TABULATED -- UNIV. OF ILLINOIS ON AIR POLLUTION; NATIONAL WILDLIFE'S OVERALL INDEX OF ENVIRONMENTAL QUALITY; AND BATTELLE'S RATING OF ENVIRONMENTAL STRESSES. WITH REGARD TO

075431 *CONTINUED*
BATTELLE STUDY, PESTICIDES RATED HIGHEST IN STRESS INDEX (140); HEAVY METALS NEXT AT 90; TRITIUM AND KR-85 WHERE LOW AT 16. IN PROJECTIONS OF FUTURE STRESS, HEAVY METALS ASSUMED INDEX OF 135; SOLID WASTES WERE NEXT AT 120; AND TRITIUM AND KR-85 HAD LIKEWISE RISEN TO 120; PESTICIDES DROPPED TO 30.

KRYPTON + WASTE DISPOSAL + RADIOACTIVITY RELEASE + ENVIRONMENT + *UNITED STATES + *SURVEY + DATA COLLECTION + *COMPARISON + POLLUTION + WASTE, INDUSTRIAL

075576
SHEETS JCPM + BERLIN A + AMAVIS PJ
SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT
COMMISSION OF THE EUROPEAN COMMUNITIES, LUXEMBOURG (BELGIUM)
12 PAGES, 1 TABLE, NUCLEAR SAFETY, 13(5), PP. 380-391 (SEPTEMBER/OCTOBER 1972)

THE SYMPOSIA PAPERS (SEPARATE ABSTRACTS APPEAR IN NSIC ABSTRACTS FOR MOST) ARE LISTED AND CHARACTERIZED BRIEFLY. SOME OF THE QUESTIONS RAISED AT A 2.5-HOUR PANEL DISCUSSION ARE PRESENTED - EFFECTS FROM TRITIUM PRODUCED BY FAST REACTORS, ACCOUNTING FOR PARAMETERS WHICH AFFECT RADIONUCLIDE UPTAKE, THE TERM 'LIMITING RADIOLOGICAL CAPACITY' INCLUDES NO SAFETY FACTORS, THE TERM 'CRITICAL POPULATION' DOES NOT ACCOUNT FOR MULTIPLE SOURCES AND EFFECTS FROM OTHER POLLUTANTS, AND EXTENSION OF THE EURATOM TREATY TO NONRADIOACTIVE POLLUTANTS. ANSWERS TO MANY OF THESE QUESTIONS REQUIRE FURTHER WORK IN 'RADIOLOGICAL FORECASTING' FOR A HYDROLOGICAL BASIN, ALSO IN ANALYSIS OF HAZARDS IN CONNECTION WITH BOTH RADIOACTIVE WASTE DISPOSAL AND ENVIRONMENTAL CONTAMINATION BY TRITIUM AND THE NOBLE-GAS RADIONUCLIDES.

ECOLOGY + EURATOM + NOBLE GAS + ATMOSPHERIC POLLUTION + WASTE DISPOSAL + *CRITICAL NUCLIDE PATHWAY + *ENVIRONMENT + WATER POLLUTION + FORECAST + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + *FOOD CHAIN + POLLUTION + ECOSYSTEM, MARINE + ECOSYSTEM, MODEL + SYSTEM ANALYSIS + MODEL, DETERMINISTIC + ECOSYSTEM, ESTUARINE + ORGANIZATION, INTERNATIONAL

075647
STEINER D + FRAAS AP
PRELIMINARY OBSERVATIONS ON THE RADIOLOGICAL IMPLICATIONS OF FUSION POWER
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
11 PAGES, 7 FIGURES, 4 TABLES, 18 REFERENCES, NUCLEAR SAFETY, 13(5)

THE RADIOLOGICAL IMPLICATIONS OF FUSION POWER ARE CONSIDERED WITH REFERENCE TO A CONCEPTUAL FUSION REACTOR BASED ON THE DEUTERIUM-TRITIUM FUEL CYCLE. THIS ANALYSIS LEADS TO THE FOLLOWING OBSERVATIONS - (1) THE ENGINEERED FEATURES NECESSARY TO LIMIT BIOLOGICAL IMPACT IN THE EVENT OF AN ACCIDENT MAY HAVE TO SATISFY LESS STRINGENT REQUIREMENTS IN FUSION-REACTOR DESIGN THAN IN FISSION REACTOR DESIGN. (2) DURING NORMAL OPERATION, TRITIUM WILL PRESENT THE PRIMARY SOURCE OF RADIOACTIVITY IN EFFLUENTS ASSOCIATED WITH FUSION POWER. THE MONITORING OF TRITIUM IN EFFLUENTS WILL BE REQUIRED ONLY AT THE REACTOR SITE SINCE THE FUEL-REPROCESSING SYSTEM OF A FUSION REACTOR IS AN INTEGRAL PART OF THE REACTOR. ECONOMIC CONTAINMENT OF TRITIUM MUST BE A MAJOR OBJECTIVE OF FUSION-REACTOR TECHNOLOGY. (3) LONG-LIVED RADIOISOTOPES WILL BE PRODUCED IN THE STRUCTURAL COMPONENTS OF FUSION REACTORS. IF NIOBIUM IS EMPLOYED AS THE STRUCTURAL MATERIAL, DISPOSAL SCHEMES SIMILAR TO THOSE CURRENTLY PROPOSED FOR FISSION-REACTOR WASTES MAY BE REQUIRED. IF VANADIUM IS EMPLOYED, RECYCLE OF THE STRUCTURAL MATERIAL APPEARS POSSIBLE. (4) ALTHOUGH AFTER HEAT REMOVAL WILL BE QUANTITATIVELY LESS OF A PROBLEM WITH FUSION POWER THAN WITH FISSION POWER, IT MUST BE CONSIDERED IN THE ENGINEERING DESIGN OF FUSION REACTORS.

BIOMEDICAL + *DEUTERIUM + *WASTE MANAGEMENT + LITHIUM + MONITORING SYSTEM, RADIATION + VANADIUM + *POWER GENERATION METHOD

075681
GREEN JB + LESSLER RM
REDUCTION OF TRITIUM FROM UNDERGROUND NUCLEAR EXPLOSIVES
UNIVERSITY OF CALIFORNIA, LIVERMORE
7 PAGES, 2 TABLES, 9 FIGURES, 4 REFERENCES, NUCLEAR TECHNOLOGY, VOL. 16, PP. 430-436 (NOVEMBER 1972)

THE INDUSTRIAL APPLICATION OF THE PLOWSHARE CONCEPT OF CURRENT INTEREST IN THE STIMULATION OF NATURAL GAS. THE DEGREE OF SUCCESS OF THIS AND OTHER APPLICATIONS MAY BE SIGNIFICANTLY AFFECTED BY THE AMOUNT OF TRITIUM PRODUCED BY THE NUCLEAR EXPLOSION. THE REDUCTION OF RESIDUAL TRITIUM HAS BEEN THE SUBJECT OF CONTINUING RESEARCH AND EVALUATION. BOTH PUBLIC SAFETY AND ECONOMICS ARE CONSIDERED IN PLANNING THIS REDUCTION. *** TRITIUM IS PRODUCED FROM TWO MAJOR SOURCES - THE EXPLOSIVE ITSELF AND THE MATERIAL AND ROCK SURROUNDING THE EXPLOSIVE. THE IMPROVED DESIGN OF THE LOW-RESIDUAL-TRITIUM PLOWSHARE UNDERGROUND ENGINEERING EXPLOSIVE REPRESENTS CONSIDERABLE PROGRESS IN THE REDUCTION OF THE AMOUNT OF TRITIUM FORMED.

CONTAINMENT + PLOWSHARE + *NUCLEAR DETONATION + *RADIOACTIVITY RELEASE + CONSUMER PRODUCT

075888
HORNYIK K
TRITIUM GENERATION IN THE COOLANT-MODERATOR OF PRESSURIZED WATER REACTORS
OREGON STATE UNIVERSITY, CORVALLIS
8 PAGES, 5 FIGURES, 2 TABLES, NUCLEAR SCIENCE AND ENGINEERING, 49(3), PP. 247-254

THE GENERATION OF TRITIUM FROM THE B-10(N, ALPHA)H-3 REACTION INVOLVING BORIC ACID IN THE COOLANT-MODERATOR OF PWR'S IS STUDIED. FIRST, THE TOTAL AMOUNT OF TRITIUM PRODUCED BY THIS PROCESS

075888 *CONTINUED*
DURING A CORE CYCLE IS CALCULATED FOR THE BASE OF BASE LOAD OPERATION ASSUMING SEPARABILITY OF THE NEUTRON FLUX INTO SPACE, ENERGY, AND TIME MODES AS WELL AS A LINEAR DECREASE OF THE BORIC ACID CONCENTRATION IN COMPENSATION FOR BURNUP EFFECTS. SUBSEQUENTLY, ANALYTIC SOLUTIONS TO THIS PROBLEM ARE OBTAINED FOR SQUARE-WAVE LOAD-FOLLOWING ASSUMING BOTH TOTAL AND ONE PARTICULAR MODE OF PARTIAL COMPENSATION OF THE REACTIVITY TRANSIENTS DUE TO XENON POISONING BY BORIC ACID.

REACTOR, PWR + *MATHEMATICAL TREATMENT + FUEL MANAGEMENT + *PRODUCTION

076136
DRUMMOND WE + DREW HR
POWER FROM NUCLEAR FUSION — PROBLEMS AND PROMISES
UNIVERISTY OF TEXAS, AUSTIN + TEXAS ATOMIC ENERGY RESEARCH FOUNDATION, FT. WORTH

A VERY COMPREHENSIVE, UNDERSTANDABLE DISCUSSION OF THE MACHINES, REACTIONS, AND SCIENTIFIC PROBLEMS ASSOCIATED WITH DEVELOPMENT OF A THERMONUCLEAR REACTOR. DISCUSSED ALSO ARE POTENTIAL MATERIALS PROBLEMS; SINCE METALLURGICAL MATERIALS WOULD BE SIMILAR TO THOSE NOW BEING INCORPORATED INTO LMFBR'S, THIS LATTER TECHNOLOGY WILL PRODUCE NECESSARY DATA WHEN THERMONUCLEAR PLANTS BECOME A REALITY. TRITIUM PROBLEM IS ASSESSED, E.G., DOSE TO HUMANS FROM A 6-MILLION-MW GENERATOR WOULD NOT EXCEED THAT FROM NATURAL RADIOACTIVITY. DIRECT CONVERSION OF THE NUCLEAR ENERGY TO ELECTRICITY IS POSSIBLILITY AND IS ESTIMATED THAT EFFICIENCY COULD BE 90%. NOTES THAT EVEN NOW WASTE-HEAT PROBLEM IS OVERRIDING; THUS, DIRECT CONVERSION COULD ELIMINATE. NOT UNREALISTIC TO EXPECT COMMERCIAL REALIZATION IN THE 1990'S.

REACTOR DESCRIPTION + ELECTRIC POWER + MATERIAL + RADIOACTIVITY RELEASE + DIRECT ENERGY CONVERSION DEVICES + *R AND D PROGRAM + THERMAL POLLUTION + *REACTOR, LMFBR + *REACTOR, THERMONUCLEAR + CONSTRUCTION + COMPONENT DESCRIPTION + THERMAL EFFICIENCY

076284
KINCAID GP JR
CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE
TEXAS A&M UNIVERSITY
243 PAGES, 15 TABLES, 10 FIGURES, AUGUST 1971

SEA WATER FROM THE YUCATAN STRAIT IS THE MAJOR SOURCE OF TRITIUM FOR THE WESTERN GULF. SEA WATER FIRST CARRIES THE H-3 OF THE YUCATAN STRAIT, AND THEN TO THE WESTERN GULF. THE PHYSICAL PROPERTIES OF THE WATER MASS THAT EXTENDS FROM THE SURFACE OF THE DEPTH OF THE SUBTROPICAL UNDERWATER, AND THE H-3 CONTENT, ARE MODIFIED BY MIXING PROCESSES AS THE WATER MOVES WESTWARD. THE INTEGRATED H-3 CONTENT OF THE WATER COLUMNS, TO A DEPTH OF 150 M, IS HIGHER IN THE WESTERN GULF THAN IN THE YUCATAN STRAIT. THIS EXCESS IS DUE TO THE INPUT OF H-3 FROM RUNOFF AND RAINFALL. A 2-BOX MODEL WAS DEVELOPED FOR THE MIXING AND EXCHANGE OF WATER MASSES IN THE UPPER LAYERS OF THE GULF OF MEXICO.

COUNTER + *DEPOSITION + *OCEAN AND SEA + REACTOR, RESEARCH + *SAMPLING + *MIXING DEPTH + CROSS SECTION + *CONCENTRATION + *DISTRIBUTION + MODEL, DETERMINISTIC + RETENTION + SPECTROMETRY

076899
ERIKSSON E
AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE
INTERNATIONAL METEOROLOGICAL INSTITUTE, SWEDEN
13 PAGES, 3 TABLES, 10 FIGURES, REFERENCES, TELLUS, XVII(1), PP. 118-130 (1965)

BOMB TRITIUM PRODUCED SINCE 1954 DURING BOMB TESTS WAS BY AND LARGE INJECTED INTO THE STRATOSPHERE. THE EXACT AMOUNTS ARE NOT KNOWN BUT VARIOUS ESTIMATES AGREE REASONABLY WELL. THE FATE OF THE BOMB PRODUCED TRITIUM IS DISCUSSED IN SOME DETAIL AND IT APPEARS THAT OCEAN SURFACES ARE VERY EFFECTIVE FOR WITHDRAWING ATMOSPHERIC TRITIUM. AVAILABLE DATA ON RAINFALL CONCENTRATIONS ARE ALSO REVIEWED AS WELL AS VARIOUS MODELS PUT FORTH TO EXPLAIN THE TRANSPORT OF TRITIUM IN NATURE.

OCEAN AND SEA + *TESTING + *ATMOSPHERIC POLLUTION + *NUCLEAR DETONATION + PRECIPITATION + CONCENTRATION + TRANSPORT

076900
WEAVER CL + HARWARD ED + PETERSON HT
TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWERPLANTS
PUBLIC HEALTH SERVICE
9 PAGES, 5 TABLES, 1 FIGURE, 12 REFERENCES, PUBLIC HEALTH REPORTS, 84(4), PP. 363-371 (APRIL 1969)

TRITIUM, AN ISOTOPE OF HYDROGEN WITH AN ATOMIC MASS NUMBER OF THREE, IS PRODUCED IN NUCLEAR REACTORS IN SUBSTANTIAL QUANTITIES. ALTHOUGH TRITIUM IS ONE OF THE LEAST HAZARDOUS RADIOACTIVE NUCLIDES, ITS CONTINUED PRODUCTION AND LONG HALF-LIFE FOR RADIOACTIVE DECAY MAY LEAD TO INCREASED LEVELS IN THE ENVIRONMENT. BECAUSE TRITIUM IS AN ISOTOPE OF HYDROGEN, IT CAN BE METABOLIZED IN THE FORM OF TRITIATED WATER AND INCORPORATED INTO BODY FLUIDS AND TISSUES. THIS SOURCE OF POPULATION EXPOSURE REQUIRES THAT PUBLIC HEALTH AGENCIES BE AWARE OF THE SIGNIFICANCE OF TRITIUM AS AN ENVIRONMENTAL CONTAMINANT.

EFFLUENT + *REACTOR, POWER + POPULATION EXPOSURE + *ENVIRONMENT + ABSORPTION + *CONCENTRATION + MAN

076901
MARTELL EA
ON THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN ATMOSPHERIC METHANE
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH
11 PAGES, 2 TABLES, 4 FIGURES, REFERENCES, J. OF GEOPHYSICAL RESEARCH, 68(13), PP. 3759-3769 (JULY 1963)

CONSIDERATION OF THE BOMB-PRODUCED TRITIUM INVENTORY AND FEATURES OF THE BUDGET AND DISTRIBUTION OF TRITIUM IN ATMOSPHERIC WATER VAPOR, HYDROGEN, AND METHANE PROVIDES A BASIS FOR REJECTING PREVIOUS EXPLANATIONS FOR THE INCORPORATION OF ARTIFICIAL TRITIUM INTO ATMOSPHERIC METHANE. IT IS CONCLUDED THAT TRITIATED HYDROGEN IS PRODUCED IN THERMONUCLEAR CLOUDS BY RADIATIVE DISSOCIATION OF WATER UNDER OXIDIZING CONDITIONS. THE OCCURRENCE OF TRITIATED METHANE IS EXPLAINED BY TROPOSPHERIC EXCHANGE OF METHANE WITH TRITIATED HYDROGEN WHICH HAS MIXED DOWNWARD FROM THE STRATOSPHERE. CHEMICAL AND ENERGY CRITERIA FOR THE EXCHANGE OF METHANE AND HYDROGEN IN THE LOWER ATMOSPHERE ARE DISCUSSED. HIGH TRITIUM CONCENTRATION OF FORMALDEHYDE FROM THUNDERSTORM RAINS IS PREDICTED.

HYDROGEN + *ATMOSPHERIC POLLUTION + NUCLEAR DETONATION + WATER VAPOR + GAS + REACTOR, THERMONUCLEAR + *CONCENTRATION + CLOUD

077109
FOSTER RF
SOURCES AND INVENTORY OF RADIOACTIVITY IN THE AQUATIC ENVIRONMENT
BATTELLE PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
BNWL-SA-4614 + CONF-730603-7 (PAPER NO. 2) +. 26 PAGES, PAPER PRESENTED AT THE 8TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973.

THE BULK OF THE INVENTORY OF MAN-PRODUCED RADIONUCLIDES IN THE SURFACE WATERS OF THE EARTH HAS COME FROM WORLD-WIDE FALLOUT AND THIS WILL PERSIST IN THE AQUATIC ENVIRONMENT FOR SEVERAL DECADES TO COME. NEVERTHELESS, POINT SOURCES OF LIQUID EFFLUENTS (ESPECIALLY FROM NUCLEAR POWER PLANTS AND FUEL PROCESSING PLANTS) WILL CONTINUE TO CREATE ABOVE AMBIENT CONCENTRATIONS OF RADIONUCLIDES NEAR OUTFALLS. OTHER CONTEMPORARY SOURCES OF RADIOACTIVE MATERIALS TO SURFACE WATERS ARE NUCLEAR POWERED SHIPS, THE SEWERS FROM INSTITUTIONS THAT USE RADIOISOTOPES FOR MEDICAL, INDUSTRIAL, OR RESEARCH PURPOSES, THE DUMPING OF PACKAGES OF LOW LEVEL WASTE, AND THE RUPTURING (OR BURNUP) OF SEALED SOURCES (E.G., SNAP DEVICES). THE USE OF NUCLEAR EXPLOSIVES FOR LARGE-SCALE ENGINEERING WOULD OVERWHELM (BY ORDERS OF MAGNITUDE) THE QUANTITIES OF RADIONUCLIDES INTRODUCED INTO A REGION BY ALL OTHER SOURCES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*EFFLUENT + ELEMENTS AND ISOTOPES + *FALLOUT + *SOURCE, RADIATION + *REACTOR, POWER + NUCLEAR DETONATION + *RADIOACTIVITY RELEASE + *WATER POLLUTION + FUEL REPROCESSING + COMMUNITY, AQUATIC + *FUEL CYCLE + HPIS

077129
MATUSZEK JP + KUNZ CR + PAPERIELLO CJ
CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES
NEW YORK STATE DEPARTMENT OF HEALTH
PAPER NO. 22 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (SEE CONF-730603--)

THE RADIOLOGICAL SCIENCES LABORATORY OF THE NEW YORK STATE DEPARTMENT OF HEALTH IS CONDUCTING A STUDY TO CHARACTERIZE THE GASEOUS RADIOACTIVE EFFLUENTS FROM NUCLEAR FACILITIES. AT THIS TIME, HOLD-UP TANK, COVER-GAS, STRIP-GAS AND STACK EFFLUENT SAMPLES FROM TWO PWR'S, A BWR AND A GAS-COOLED REACTOR HAVE BEEN ANALYZED. GASEOUS SPECIES ARE CHROMATOGRAPHICALLY SEPARATED, THEN COUNTED IN GAS PROPORTIONAL COUNTING SYSTEMS. SPECTROMETRIC MEASUREMENTS HAVE RESULTED IN THE IDENTIFICATION AND QUANTIFICATION OF H-3 (AS HYDROGEN GAS, WATER AND METHANE), C-14 (AS METHANE AND CARBON DIOXIDE), RADIOARGON, RADIOKRYPTON, RADIOXENON AND RADIOIODINE. EXPERIENCE IN SAMPLE COLLECTION, HANDLING, AND ANALYSIS ARE DISCUSSED WITH REGARD TO APPENDIX I REQUIREMENTS, PARTICULARLY WITH REGARD TO REPORTING REQUIREMENTS IMPOSED BY SAFETY GUIDE 21.

AVAILABILITY - JOHN M. MATUSZEK, NEW YORK STATE DEPARTMENT OF HEALTH, ALBANY, NEW YORK 12201

CARBON + *EFFLUENT + *CHROMATOGRAPHY + IODINE + KRYPTON + MPC + REGULATION + XENON + ARGON + *MONITOR, GAS + *ANALYTICAL TECHNIQUE + *RADIOLYTIC GAS + *GAS + *SPECTROMETRY + *POWER PLANT, NUCLEAR + NRC REGULATORY GUIDE

077143
ROHWER PS + KELLY MJ
RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL GAS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
PAPER NO. 36 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (SEE CONF-730603--)

TRITIUM AND KRYPTON-85 ARE THE PREDOMINANT RESIDUAL MAN-MADE RADIONUCLIDES PRESENT IN NATURAL GAS PRODUCED FROM NUCLEARLY STIMULATED WELLS. SIMPLE COMPARISON OF CONCENTRATIONS OF THESE RADIONUCLIDES DOES NOT PROVIDE A GOOD INDICATION OF THE RELATIVE RADIOLOGICAL IMPORTANCE EVEN THOUGH A COMPARISON OF THEIR MPC'S(H-3, 0.2 PCI/CM-3; KR-85, 0.3 PCI/CM-3) SUGGESTS THAT EQUAL CONCENTRATIONS OF TRITIUM AND KRYPTON-85 ARE OF NEARLY EQUAL RADIOLOGICAL SIGNIFICANCE. IN DISCUSSING THE FALLACY OF USING CONCENTRATIONS OR MPC'S TO MAKE THIS PARTICULAR COMPARISON, DETAILED CONSIDERATION IS GIVEN TO EACH RADIONUCLIDE TO EMPHASIZE DIFFERENCES IN TYPE OF RADIATION EMISSION, PHYSICAL AND CHEMICAL FORM, UPTAKE BY MAN, AND REFERENCE TISSUE.

077143 *CONTINUED*
AVAILABILITY - P.S. ROHWER, ENVIRONMENTAL SCIENCES DIVISION, OAK RIDGE NATIONAL LABORATORY, P.O. BOX Y, OAK RIDGE, TENNESSEE 37830

*KRYPTON + MPC + *POPULATION EXPOSURE + *CONTAMINATION + RADIOLOGICAL ASSISTANCE + *GAS + CONCENTRATION + *EFFECT, GENETIC + *COMPARISON + *EFFECT, SOMATIC + STIMULATION + *RESOURCE, NATURAL + PHYSICOCHEMICAL FORM + HPIS

077193
CROWSON DL
MAN-MADE TRITIUM
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
5 PAGES, PP. 23-27 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

THE TOPIC OF MAN-MADE TRITIUM DIVIDES ITSELF INTO SEVERAL SUBTOPICS. THESE INCLUDE THE MECHANISMS FOR THE PRODUCTION OF MAN-MADE TRITIUM, THE EXTENT OF THIS PRODUCTION AS COMPARED TO NATURAL MEANS OF PRODUCTION, PREDICTIONS OF THE RATE OF TRITIUM GENERATION BY HUMAN ACTIVITIES IN YEARS TO COME, SOME PROBLEMS CONCERNING THE MANAGEMENT OF MAN-MADE TRITIUM, AND SOME CONCLUSIONS AS TO MEASUREMENTS FOR REDUCTION OF TRITIUM IN THE ENVIRONMENT.

FISSION PRODUCT RELEASE + *MONITOR, ENVIRONMENTAL + *WASTE MANAGEMENT + RADIATION SAFETY AND CONTROL + RADIOACTIVITY RELEASE + SAFETY EVALUATION + *FORECAST + *PRODUCTION + *CONCENTRATION + HPIS

077194
HORROCKS DL
YIELDS OF TRITIUM DURING THE FISSIONING OF NUCLIDES OF INTEREST IN THE OPERATION OF NUCLEAR POWER REACTORS
ARGONNE NATIONAL LABORATORY
7 PAGES, PP. 30-37 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

TRITIUM IS PRODUCED FROM FISSION. THE CONSEQUENCE OF THIS CAN BE USEFUL AND/OR HAZARDOUS. IT WILL BE VERY IMPORTANT TO THE FUTURE OF NUCLEAR POWER SOURCES TO KNOW THE ACTUAL YIELD OF TRITIUM SO THAT ALL PRECAUTIONS CAN BE EXERCISED TO LIMIT ANY HARMFUL EFFECTS. IT SHOULD ALSO BE REMEMBERED THAT THERE ARE OTHER SOURCES OF TRITIUM WHICH ARE MORE PRODUCTIVE THAN THE FISSION PROCESS: NEUTRONS ON LI-6 AND NEUTRONS ON DEUTERIUM. VERY SMALL AMOUNTS OF LITHIUM IMPURITY CAN PRODUCE MUCH MORE TRITIUM THAN IS PRODUCED BY THE FISSION PROCESS.

*DEUTERIUM + FISSION PRODUCT RELEASE + *MEASUREMENT + *REACTOR, POWER + MONITOR + *LITHIUM + *PRODUCTION + *CONCENTRATION + ENERGY SPECTRUM + BENEFIT VS RISK

077195
KOUTS H +, LONG J
TRITIUM PRODUCTION IN NUCLEAR REACTORS
BROOKHAVEN NATIONAL LABORATORY, N.Y. +, U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
30 PAGES, PP. 38-68 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

NEW INFORMATION HAS BEGUN TO APPEAR ON ACTUAL MEASURED AMOUNTS OF TRITIUM GENERATED IN OPERATING REACTORS. FURTHERMORE, SOME NEW TRENDS ARE DEVELOPING IN DESIGNS AND MODES OF OPERATION OF POWER REACTORS, TRENDS THAT COULD HAVE A SIGNIFICANT EFFECT IN THE FUTURE ON THE RELEASE RATES OF TRITIUM FROM POWER REACTORS AND THE PLACES WHERE RELEASES OCCUR. THIS IS AN UPDATING OF THE REVIEWS OF TWO TO THREE YEARS AGO, CONCERNED WITH RATES OF TRITIUM PRODUCTION IN NUCLEAR POWER REACTORS, TAKING NEW INFORMATION INTO ACCOUNT.

REACTOR, BWR + REACTOR, BREEDER + REACTOR, HWR + REACTOR, MOLTEN SALT + REACTOR, PWR + *REACTOR + REACTOR, HTGR + FORECAST + REACTOR, LMFBR + *PRODUCTION + *POWER PLANT, NUCLEAR

077196
LESSLER RM + GREEN JB + HOZER F
TRITIUM PRODUCTION IN PLOWSHARE APPLICATIONS
LAWRENCE LIVERMORE RADIATION LABORATORY, CALIFORNIA
10 PAGES, PP. 69-79 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

DETONATION OF A NUCLEAR EXPLOSIVE PRODUCES SUBSTANTIAL AMOUNTS OF RADIOACTIVE MATERIALS. A SIGNIFICANT COMPONENT OF THIS MATERIALS IS TRITIUM, AND ITS PRODUCTION HAS BEEN THE SUBJECT OF CONTINUING RESEARCH AND EVALUATION WITHIN THE PLOWSHARE PROGRAM. A MAJOR GOAL OF THE PROGRAM HAS BEEN TO REDUCE, AS MUCH AS POSSIBLE, THE AMOUNT OF TRITIUM FORMED, WHILE DEVELOPING AN ECONOMICALLY ATTRACTIVE EXPLOSIVE SYSTEM FOR INDUSTRIAL APPLICATIONS. WITH THE CURRENT EMPHASIS OF PLOWSHARE SHIFTED FROM EXCAVATION TO UNDERGROUND ENGINEERING, TRITIUM HAS BECOME AN EVEN MORE IMPORTANT CONSIDERATION. IN NATURAL GAS STIMULATION AND STORAGE PROJECTS, FOR EXAMPLE, SOME TRITIUM COULD EXCHANGE WITH HYDROGEN IN METHANE FUEL.

CONTAINMENT, UNDERGROUND + FISSION PRODUCT RELEASE + *PLOWSHARE + *NUCLEAR DETONATION + RADIOACTIVITY RELEASE + GAS + CONSUMER PRODUCT + *PRODUCTION + RESOURCE, NATURAL + HPIS

077197
PRODUCTION OF TRITIUM BY NUCLEAR WEAPONS
LAWRENCE LIVERMORE RADIATION LABORATORY, CALIFORNIA
7 PAGES, PP. 79-85 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

077197 *CONTINUED*
THE EFFECTS OF NUCLEAR WEAPONS TESTS ON THE CURRENT WORLD TRITIUM INVENTORY CAN BE SUMMARIZED AS FOLLOWS: (1) THE CONTRIBUTION FROM FISSION WEAPONS IS NEGLIGIBLE, WHETHER THEY WERE TESTED IN THE ATMOSPHERE OR UNDERGROUND. (2) THE CONTRIBUTION FROM THE THERMONUCLEAR TESTS THAT WERE CONDUCTED IN THE ATMOSPHERE IS LARGE. THE PRESENT INVENTORY IS APPROXIMATELY 45 TIMES THE NATURAL BACKGROUND AS A RESULT OF WEAPONS TESTING AND, EVEN IN THE ABSENCE OF FURTHER ATMOSPHERIC TESTS, WILL BE A SIGNIFICANT (>10%) PERTURBATION ON THE NATURAL BACKGROUND FOR ABOUT 100 YEARS. (3) THE UNDERGROUND TESTING OF THERMONUCLEAR WEAPONS HAS NOT CONTRIBUTED SIGNIFICANTLY TO THE ATMOSPHERIC BURDEN, EVEN WHEN THE CONTAINMENT HAS BEEN IMPERFECT.

FISSION PRODUCT RELEASE + *TEST, WEAPONS + *NUCLEAR DETONATION + REACTOR, THERMONUCLEAR + *PRODUCTION + HPIS

077311
STAPLETON GB + THOMAS RH
ESTIMATION OF THE INDUCED RADIOACTIVITY OF THE GROUND WATER SYSTEM IN THE NEIGHBORHOOD OF A PROPOSED 300 BEV HIGH ENERGY ACCELERATOR SITUATED ON A CHALK SITE
RUTHERFORD HIGH ENERGY LABORATORY, ENGLAND
11 PAGES, 3 TABLES, 19 REFERENCES, HEALTH PHYSICS, 23(5), PP. 689-699 (NOVEMBER 1972)

ESTIMATES OF RADIONUCLIDE PRODUCTION IN THE EARTH SHIELDING AND GROUND WATER AROUND A PROPOSED 300 GEV PROTON SYNCHROTRON ARE REPORTED. AT A PARTICULAR CHALK SITE STUDIED H-3, BE-7 AND P-32 WERE SHOWN TO WARRANT DETAILED INVESTIGATION. CHEMICAL SORPTION ON ROCK CHALK ELIMINATES BE-7 AND P-32 AS SIGNIFICANT CONTAMINANTS OF THE GROUND WATER SYSTEM. IN ADDITION, THE RELATIVELY SHORT RESIDENCE TIMES OF WATER IN REGIONS OF HIGH NEUTRON FLUX DENSITY AND SUBSEQUENT DILUTION IN THE GROUND WATER OF THE PARTICULAR SITE STUDIED ENSURE THAT TRITIUM CONTAMINATION WOULD BE INCONSEQUENTIAL.

*BERYLLIUM + CHEMICAL REACTION + DILUTION + *GROUND WATER + *SITING + *PHOSPHORUS + CONTAMINATION + *SOIL + SORPTION + SHIELDING + *ACCELERATOR + SAFETY EVALUATION + *CONCENTRATION

078884
STRUXNESS EG + KOHWER PS + KELLY MJ ET AL.
RELATIVE RISKS FROM RADIONUCLIDES FOUND IN NUCLEARLY STIMULATED NATURAL GAS
OAK RIDGE NATIONAL LABORATORY, TENN.
CONF-721108-4 +. 27 PAGES, PAPER PRESENTED AT PNE PANEL MEETING, HELD IN VIENNA ON NOV. 26, 1972

THE RISKS FROM MAN-MADE RADIONUCLIDES POSSIBLY PRESENT IN NUCLEARLY STIMULATED NATURAL GAS ARE CONSIDERED IN THREE STEPS - (1) RADIONUCLIDES ARE RANKED ON THE BASIS OF THEIR ESTIMATED RADIATION DOSE POTENTIALS; (2) PROJECTED DOSES EXPECTED TO RESULT FROM GAS USAGE ARE COMPARED WITH ESTIMATED DOSES FROM OTHER RADIATION SOURCES; AND (3) RISK PROJECTIONS FOR THE ESTIMATED DOSES ARE COMPARED WITH OTHER RISKS ENCOUNTERED IN THE NORMAL ACTIVITIES OF LIFE IN TECHNOLOGICALLY DEVELOPED NATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAINMENT, UNDERGROUND + ELEMENTS AND ISOTOPES + KRYPTON + MEASUREMENT + PLOWSHARE + STRONTIUM + *NUCLEAR DETONATION + RADON + *POPULATION EXPOSURE + CONTAMINATION + *GAS + CONCENTRATION + *STIMULATION + *RESOURCE, NATURAL + BENEFIT VS RISK + BENEFICIAL USE

079069
KLEMENT AW + MILLER CP + MINX RP, ET AL.
ENVIRONMENTAL RADIATION
ENVIRONMENTAL PROTECTION AGENCY
ORP/CSD-72-1 +. 72 PAGES, PP. 7-79, AUGUST 1972

A MAJOR SOURCE OF RADIATION DOSES IN THE UNITED STATES IS NATURAL RADIATION. THE TOTAL ESTIMATED ANNUAL WHOLE-BODY DOSE INCREASES FROM 23.8 MILLION MAN-REM IN 1960 TO 41.7 MAN-REM IN THE YEAR 2000 FROM COSMIC AND NATURAL TERRESTRIAL SOURCES. THE INCREASE IS DUE EXCLUSIVELY TO INCREASES IN POPULATION SIZE. GLOBAL FALLOUT FROM NUCLEAR EXPLOSIVES TESTS CONTRIBUTED ABOUT 1 MILLION MAN-REM (WHOLE-BODY) IN 1960, A HIGH OF 2.4 MILLION MAN-REM IN 1963, AND 0.8 MILLION MAN-REM IN 1970. FUTURE DOSES FROM FALLOUT FRO 1980 ARE PREDICTED TO BE 1.1 MILLION MAN-REM, INCREASING TO 1.6 MILLION MAN-REM IN 2000, THE INCREASE AGAIN BEING DUE TO POPULATION GROWTH. THE TOTAL DOSE CONTRIBUTED BY ALL OTHER ENVIRONMENTAL SOURCES INCREASES FROM 0.015 MILLION MAN-REM IN 1960 TO 0.15 MILLION MAN-REM IN 2000.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. ($1.50/COPY)

DOSE + FALLOUT + KRYPTON + RADIATION DAMAGE + *SOURCE, RADIATION + TEST, WEAPONS + REACTOR, POWER + SOURCE, VOLUME + *DOSE CALCULATION, EXTERNAL + *ENVIRONMENT + *SAFETY EVALUATION + FUEL REPROCESSING + FORECAST + RADIATION EFFECT + *RADIATION EXPOSURE + WHOLE BODY + *EXPOSURE, BACKGROUND

080416
WOLKENHAUER WC
THE PACIFIC NORTHWEST LABORATORY ANNUAL REPORT ON CONTROLLED THERMONUCLEAR REACTOR TECHNOLOGY - 1972
BATTELLE PACIFIC NORTHWEST LABORATORY
BNWL-1685 +. 19 PAGES, PP. 33-52, NOVEMBER 1972

RESEARCH PROJECTS WERE CARRIED ON IN NEUTRONICS, CROSS SECTION THEORY, ECONOMICS, MATERIALS PROJECTS OF SEVERAL KINDS, AND THERMAL HYDRAULICS. THE LATTER PROJECT IS AN EXAMPLE OF AN AREA

080416 *CONTINUED*
OF WORK THAT IS JUST BEING INITIATED. IN GENERAL, THE ABOVE PROJECTS REPRESENT A MARRIAGE OF THE CRITICAL NEEDS OF THE CTR ENGINEERING PROGRAM WITH THE SPECIFIC ABILITIES OF THE LABORATORY. THIS IS IN LINE WITH THE BNW CTR PROJECT PHILOSOPHY OF ONLY CARRYING OUT WORK WHICH AT THIS TIME FALLS WITHIN THE DUAL AREA OF CRITICAL PROGRAM NEED AND SPECIFIC BNW COMPETENCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GRAPHITE + NIOBIUM + PLUTONIUM + URANIUM + CROSS SECTION + *REACTOR, THERMONUCLEAR

080427
UNRUH CM
PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION (THE GIVENS)
BATTELLE PACIFIC NORTHWEST LABORATORIES
BNWL-SA-3354 + CONF-700609-4 +. 13 PAGES, PAPER PRESENTED AT THE 15TH ANNUAL MEETING OF HEALTH PHYSICS SOCIETY, HELD IN CHICAGO ON JUNE 28, 1970

THE GENERATION OF ELECTRIC POWER BY EITHER FOSSIL OR FISSIL FUELS HAS LED TO THE CONTAMINATION OF THE ENVIRONMENT. THE DATA EXAMINED INDICATES THAT DOSE CONTRIBUTIONS ARE EXPECTED TO BE NOMINAL FOR THE WORLDWIDE DISTRIBUTION OF TRITIUM AND KRYPTON THROUGH THE YEAR 2000. PRUDENT MANAGEMENT IN THE NUCLEAR POWER INDUSTRY WOULD NEVERTHELESS INDICATE THAT SEPARATION AND STORAGE OF THESE RADIONUCLIDES TO PREVENT THEIR UNCONTROLLED RELEASE TO THE ENVIRONMENT SHOULD BE A SERIOUS OBJECTIVE TO BE REALIZED AS SOON AS PRACTICAL. RADIATION EXPOSURE CONDITIONS IN LOCAL AREAS WHERE TRITIUM AND KRYPTON ARE RELEASED-WHILE NOT DISUCSSED IN THIS PRESENTATION-NEEDS CAREFUL STUDY AND MAY DICTATE THE DEGREE OF INITIAL CONTROL REQUIRED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*EFFLUENT + KRYPTON + PLOWSHARE + REGULATION + SOURCE, RADIATION + TESTING + REACTOR, POWER + *ENERGY PREDICTION + NUCLEAR DETONATION + *POPULATION EXPOSURE + *ENVIRONMENT + *FORECAST + ENVIRONMENTAL CONTROL MEASURE + FUEL, FOSSIL + *CONCENTRATION + INDUSTRY, NUCLEAR + *N-POWER FORECAST

080626
CARACH J + CECHVALA L
SOURCES OF TRITIUM AND ITS RADIATION-HYGIENIC PROBLEMS
AEC-TR-7417 +. 16 PAGES, 1971

THE STUDY GIVES A SURVEY OF THE FORMATION AND SOURCES OF TRITIUM IN NATURE AND ITS RELEASE IN OPERATING NUCLEAR REACTORS AND TRIGGERING THERMONUCLEAR EXPLOSIONS. THE BIGGEST SOURCE OF TRITIUM IN NATURE IS BOMBARDING OF ATMOSPHERIC NITROGEN N-14 WITH SECONDARY NEUTRONS. THE OTHER SOURCES CONTRIBUTE ONLY TO AN INSIGNIFICANT EXTENT TO CREATE THE OVERALL AMOUNT OF NATURAL TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + *SOURCE, RADIATION + *REACTOR, POWER + *NUCLEAR DETONATION + RADIATION SAFETY AND CONTROL + RADIOACTIVITY RELEASE + SAFETY EVALUATION + *FUEL REPROCESSING + *REACTOR, THERMONUCLEAR

080690
TAYLOR RW
THERMAL EFFECTS OF UNDERGROUND NUCLEAR EXPLOSION
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
9 PAGES, 8 FIGURES, 32 REFERENCES, NUCLEAR TECHNOLOGY, 18(2), PP. 185-193 (MAY 1973)

MOST OF THE ENERGY OF AN UNDERGROUND NUCLEAR EXPLOSION IS DEPOSITED NEAR THE SITE OF THE EXPLOSION AS HEAT. LABORATORY EXPERIMENTS ON SHALES THAT ARE MOSTLY FINE GRAIN MIXTURES OF QUARTZ AND CARBONATE SHOW THAT CO2 IS RELEASED AT TEMPERATURES AS LOW AS 500 C, EVEN UNDER A CO2 PRESSURE OF 50 ATM. IN THE FUTURE, THE RELEASE OF LARGE AMOUNTS OF CO2 MAY BE USED TO ADVANTAGE IN SECONDARY OIL RECOVERY AND IN THE RECOVERY OF HEAVY CRUDE OILS, BECAUSE OF THE GREAT REDUCTION IN VISCOSITY THAT RESULTS AS CO2 DISSOLVES IN THESE OILS. THE NUCLEAR CHIMNEY, WITH ITS LARGE VOID VOLUME, LARGE SURFACE AREA FOR CATALYSIS, AND HIGH TEMPERATURES, IS A POTENTIAL HIGH PRESSURE VESSEL FOR CHEMICAL REACTION.

EXPLOSION + HYDROGEN + *PLOWSHARE + *CARBON DIOXIDE + STEAM + THERMODYNAMICS + THERMAL PROPERTY

080697
HICKMAN RG
SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
UCRL-74057 (REV. 1) + CONF-721111-16 +. 46 PAGES, PAPER PRESENTED AT THE INTERNATIONAL MEETING ON THE TECHNOLOGY OF CONTROLLED THERMONUCLEAR FUSION EXPERIMENTS AND THE ENGINEERING ASPECTS OF FUSION REACTORS, HELD IN AUSTIN, TEXAS, ON NOVEMBER 20, 1972

A NUMBER OF PROBLEMS ASSOCIATED WITH THE USE OF TRITIUM IN FUSION REACTORS ARE YET TO BE CONSIDERED. SOME ARE PECULIAR TO MIRROR MACHINES AND ATTEMPTS AT DIRECT CONVERSION OF PLASMA ENERGY TO ELECTRICITY, WHILE OTHERS ARE OF GENERAL CONCERN. SEVERAL OF THESE ARE CONSIDERED FROM THE POINT OF VIEW OF ONE WHO HAS WORKED WITH TRITIUM FOR SEVERAL YEARS. SPECIFIC AREAS MENTIONED INCLUDE LIQUID-PHASE MASS TRANSFER OF TRITIUM IN LIQUID LITHIUM, ISOTOPIC SEPARATION, PRELIMINARY CALCULATIONS ON PERMEATION BARRIERS, ISOTOPIC SWAMPING, AND SOME THOUGHTS ON MAINTENANCE.

080697 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*MAINTENANCE AND REPAIR + *METAL, LIQUID + LITHIUM + MASS TRANSFER + PLASMA + MAINTENANCE, REMOTE + *REACTOR, THERMONUCLEAR

080708
WORADLO GP + RUBIN BF + ROY P
TRITIUM ANALYSIS OF MIXED-OXIDE FUEL RODS IRRADIATED IN A FAST FLUX
GENERAL ELECTRIC COMPANY
GEAP-13864 +. 18 PAGES, 5 TABLES, AUGUST 1972

TRITIUM DISTRIBUTIONS HAVE BEEN DETERMINED FOR THE FUEL, CLADDING, AND FISSION GAS OF FOUR STAINLESS STEEL CLAD, MIXED-OXIDE FUEL RODS IRRADIATED IN A FAST FLUX. THE AVERAGE FUEL BURNUP RANGED FROM 46,000 TO 79,000 MWD/TE AT AVERAGE POWERS OF 11 TO 13 KW/FT. THE RESULT OF THIS STUDY SHOWED THAT LESS THAN 1% OF THE TRITIUM PRODUCED WAS RETAINED IN THE FUEL. LITTLE OR NO TRITIUM WAS FOUND IN EITHER THE CLADDING OR FISSION GAS. IT IS DEDUCED THAT THE MAJORITY OF THE TRITIUM PRODUCED IN THE FUEL WILL BE RELEASED TO THE PRIMARY SYSTEM COOLANT AND A PORTION OF THIS TRITIUM WILL EVENTUALLY FIND ITS WASY INTO THE REACTOR COVER GAS. A PRELIMINARY ESTIMATE INDICATED THE PARTIAL PRESSURE OF TRITIUM IN THE COVER GAS WILL BE 2 TO 5 TIMES THAT OF HYDROGEN, OR 0.5 TO 1.0 X 10(-3) TORR DURING STEADY-STATE OPERATION AT A COLD TRAP TEMPERATURE OF 121 C (250 F).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DIFFUSION + CLADDING + FUEL BURNUP + HYDROGEN + *ZIRCONIUM + FISSION PRODUCT TRANSPORT + STEEL, STAINLESS + URANIUM DIOXIDE + ZIRCALOY + REACTOR, LMFBR + FUEL ELEMENTS

080825
LARSEN RP + DUDEY ND + VOGEL RC + ET. AL
CHEMICAL ENGINEERING DIVISION BURNUP, CROSS SECTION, AND DOSIMETRY SEMIANNUAL REPORT, JANUARY-JUNE 1972
ARGONNE NATIONAL LABORATORY
ANL-7924 +. 48 PAGES, FIGURES, SEPTEMBER 1972

RESEARCH AND DEVELOPMENT EFFORTS OF THE BURNUP, CROSS SECTIONS AND DOSIMETRY PROGRAMS IN THE CHEMICAL ENGINEERING DIVISION OF ARGONNE NATIONAL LABORATORY ARE REPORTED FOR THE PERIOD JANUARY TO JUNE 1972. WORK IS REPORTED IN THE FOLLOWING AREAS: (1) DEVELOPMENT OF AN X-RAY SPECTROMETRIC METHOD FOR THE DETERMINATION OF THE RARE-EARTH FISSION PRODUCTS AND APPLICATION OF THIS METHOD TO THE DETERMINATIONS OF BURNUP IN NUCLEAR FUELS; (2) DETERMINATION OF FAST FISSION YIELDS OF BURNUP MONITORS AND OTHER FISSION PRODUCTS; (3) A SEARCH FOR A SPONTANEOUSLY FISSIONING ISOMER OF PU-241; (4) MEASUREMENTS OF THE TRITIUM AND ALPHA PARTICLE YIELDS IN FAST-NEUTRON FISSION OF U-235 AND PU-239; (5) EVALUATIONS OF AVAILABLE DATA ON THE DIFFERENTIAL CROSS SECTIONS FOR THE FE-56(N,P)MN-56 AND S-32(N,P)P-32 REACTIONS; AND (6) MEASUREMENTS OF BOTH FISSION RATES BY SOLID-STATE TRACK RECORDERS AND REACTION RATES BY FOIL ACTIVATION, IN THE COUPLED FAST REACTIVITY MEASUREMENT FACILITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CERIUM + *DOSIMETRY + REACTOR, FAST + *FUEL BURNUP + PLUTONIUM + LANTHANUM + *CROSS SECTION + REACTOR, LMFBR + SPECTROMETRY, X-RAY

080977
STOEVER D
DETERMINATION OF THE RELEASE BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO COMPACTS
INSTITUT FUER REAKTORENTWICKLUNG, WEST GERMANY
JUL-863-RG +. 142 PAGES, FIGURES, TABLES, JUNE 1972

THIS REPORT REFERS TO POST-IRRADIATION INVESTIGATIONS ON NEUTRON-IRRADIATED SINTERED BEO COMPACTS. THE MACROSCOPIC-MECHANICAL PROPERTIES OF THE SAMPLES SUCH AS DENSITY, POROSITY, AND YOUNG'S MODULUS IS DISCUSSED AS WELL AS THE RADIATION DAMAGE OF BOTH COMPOSITION AND LATTICE STRUCTURE. BY MEANS OF A SPECIALLY DEVELOPED VACUUM ASSEMBLY, THE RELEASE BEHAVIOR OF HELIUM WAS STUDIED BOTH ISOTHERMAL AND WITH A VARYING FUNCTION OF TEMPERATURE AND TIME. AN ABSOLUTE DETERMINATION OF THE TOTAL CONTENTS OF HELIUM AND TRITIUM IN THE SAMPLES IS ACHIEVED BY A CHEMICAL ANALYSIS. THE RESULTS ARE DISCUSSED, AND THEY ARE DESCRIBED QUANTITATIVELY BY THE APPLICATION OF A MODIFIED DIFFUSION THEORY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BERYLLIUM + OXIDE + HELIUM + IN PILE EXPERIMENT + RADIONUCLIDE, INDUCED

081061
ORALEY JE + GREENBERG S
SOME FEATURES OF THE IMPACT OF A FUSION REACTOR POWER PLANT ON THE ENVIRONMENT
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-721111-22 +. 38 PAGES, PAPER PRESENTED AT THE INTERNATIONAL MEETING ON THE TECHNOLOGY OF CONTROLLED THERMONUCLEAR FUSION EXPERIMENTS AND THE ENGINEERING ASPECTS OF FUSION REACTORS, HELD IN AUSTIN, TEXAS, NOV. 20, 1973

EXCEPTING TRITIUM, THERE WILL BE NO DIRECT RADIOACTIVE PRODUCTS OF THE POWER-PRODUCING FUSION

081061 *CONTINUED*
PROCESS. THIS ENSURES THE ABSENCE OF LARGE AMOUNTS OF LONG-LIVED RADIOACTIVE SUBSTANCES THAT CAN BE DISPERSED BY ACCIDENT OR SABOTAGE. IT ALSO AVOIDS THE CONCENTRATION OF LARGE-CURIE AMOUNTS OF FISSION PRODUCTS AT FUEL REPROCESSING PLANTS, WITH THE RELATIVELY HIGH RELEASE RATES NOW ENCOUNTERED AND THE RISK OF LARGE ACCIDENTAL RELEASES AT FUTURE REPROCESSING PLANTS, WHERE ROUTINE RELEASES ARE EXPECTED TO BE LOW.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FISSION GAS RELEASE + *ENVIRONMENT + FUEL REPROCESSING + *REACTOR, THERMONUCLEAR

081331
THE POTENTIAL RADIOLOGICAL IMPLICATIONS OF NUCLEAR FACILITIES IN THE UPPER MISSISSIPPI RIVER BASIN IN THE YEAR 2000
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF REACTOR DEVELOPMENT AND TECHNOLOGY
WASH-1209 +. 244 PAGES, 49 TABLES, 122 FIGURES, 159 REFERENCES, JANUARY 1973

THIS STUDY CONSIDERS THE RADIATION POTENTIALLY RECEIVED BY THE POPULATION OF THE UPPER MISSISSIPPI RIVER BASIN STUDY AREA WHICH MIGHT RESULT FROM THE OPERATION OF NUCLEAR POWER AND FUEL REPROCESSING FACILITIES IN THE YEAR 2000. THE RESULTS OF THE STUDY BASED ON THE SELECTED RADIOACTIVE-WASTE-TREATMENT SYSTEMS SHOWED THAT, ON THE AVERAGE THROUGHOUT THE REGION, THE POTENTIAL RADIATION AN AVERAGE INDIVIDUAL COULD RECEIVE IN THE YEAR 2000 WOULD BE INCREASED BY ROUGHLY 0.2 MILLIREM/YEAR BECAUSE OF THE PRESENCE OF NUCLEAR FACILITIES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*EFFLUENT + IODINE + WASTE TREATMENT + FISSION PRODUCT TRANSPORT + *REACTOR, POWER + DIETARY HABIT + *POPULATION EXPOSURE + CRITICAL NUCLIDE PATHWAY + HYDROLOGY + POPULATION DISTRIBUTION + RADIOACTIVITY RELEASE + *ENVIRONMENT + METEOROLOGY + TOPOGRAPHY + FUEL REPROCESSING + MONITOR, AREA + *FORECAST + *RIVER, MISSISSIPPI + FOOD CHAIN + RADIATION EFFECT

081698
STEINER D
THE RADIOLOGICAL IMPACT OF FUSION
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
4 PAGES, 2 TABLES, 2 FIGURES, NEW SCIENTIST, 52(774), PP. 168-171 (DECEMBER 16, 1971)

FUSION REACTORS WILL ENTAIL THE HANDLING AND CONTROL OF SIGNIFICANT QUANTITIES OF RADIOACTIVE MATERIALS. HOWEVER, THE HARMFUL EFFECTS OF RADIATION FROM FUSION POWER ARE EXPECTED TO BE LESS SEVERE THAN THOSE FROM FISSION POWER. COMPARES BOTH QUALITATIVELY AND QUANTITATIVELY THE INVENTORIES OF RADIOACTIVE MATERIALS ANTICIPATED IN FUSION REACTORS WITH THOSE CHARACTERISTICS OF FISSION REACTORS.

EFFLUENT + NIOBIUM + *HAZARD, RELATIVE + *WASTE DISPOSAL + *REACTOR, POWER + *HAZARDS ANALYSIS + WASTE MANAGEMENT + *FISSION PRODUCT ACTIVITY, GROSS + RADIOACTIVITY RELEASE + VANADIUM + MONITOR, AREA + *REACTOR, THERMONUCLEAR + PRODUCTION + COMPARISON

082317
EISENBUD M
FUEL REPROCESSING
NEW YORK UNIVERSITY MEDICAL CENTER, NEW YORK
8 PAGES, PP. 290-298 OF 'ENVIRONMENTAL RADIOACTIVITY', PUBLISHED BY ACADEMIC PRESS, INC., 1973 (BOOK)

WHEN A REACTOR CORE HAS REACHED THE END OF ITS USEFUL LIFE, ONLY A SMALL PERCENTAGE OF THE 235U WILL HAVE BEEN TRANSMUTED TO 239PU AND OTHER TRANSURANIC ELEMENTS. THE CORE WITH ITS INVENTORY OF FISSION PRODUCES AND LONG-LIVED ALPHA-EMITTING HEAVY RADIOELEMENTS IS THEN REMOVED FROM THE REACTOR STORED UNDER WATER IN THE FUEL STORAGE POOLS ASSOCIATED WITH THE REACTOR, AND THEN TRANSPORTED TO A FUEL-REPROCESSING PLANT IN WHICH THE SPENT FUEL IS CHEMICALLY TREATED TO: (1) CONVERT THE FISSION PRODUCTS INTO A FORM SUITABLE FOR LONG-TERM STORAGE; AND (2) RECOVER THE REMAINING 235U AND THE TRANSURANIC ELEMENTS.

CESIUM + DOSE + FISSION PRODUCT RELEASE + FUEL HANDLING + KRYPTON + ALPHA EMITTER + *PLUTONIUM + FUEL STORAGE + STRONTIUM + *URANIUM + AIR + WATER, DRINKING + *POPULATION EXPOSURE + *PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + TRANSURANIUM ELEMENT + *FUEL REPROCESSING + CONCENTRATION + *RADIATION EXPOSURE + MAN + FOOD + HPIS + FUEL ELEMENTS

082319
EISENBUD M
FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS
NEW YORK UNIVERSITY MEDICAL CENTER, NEW YORK
37 PAGES, PP. 316-353 OF 'ENVIRONMENTAL RADIOACTIVITY', PUBLISHED BY ACADEMIC PRESS, INC., 1973 (BOOK)

THE USE OF NUCLEAR WEAPONS PRODUCES RADIOACTIVE CONTAMINATION ON A SCALE THAT, WHEN COMPOUNDED WITH THE EFFECTS OF BLAST AND FIRE, WOULD CREATE WARTIME PROBLEMS FOR WHICH AT PRESENT THERE IS NO FORESEEABLE SOLUTION. MOREOVER, AS IS WELL KNOWN, THE PEACETIME TESTING OF NUCLEAR WEAPONS IS CAPABLE OF PRODUCING WORLDWIDE CONTAMINATION AND WAS THE SUBJECT OF INTENSE WORLDWIDE CONCERN BETWEEN 1954 AND THE SIGNING OF A TEST-BAN AGREEMENT IN 1963. THIS CHAPTER DISCUSSES THE SUBJECT OF NUCLEAR AND THERMONUCLEAR EXPLOSIONS IN GENERAL AND THEN REVIEWS THE PRINCIPAL RADIOLOGICAL CONSEQUENCES OF THE USE OF SUCH WEAPONS IN WAR.

082319 *CONTINUED*
CERIUM + CESIUM + DEPOSITION + *FALLOUT + FISSION PRODUCT RELEASE + INGESTION + INHALATION + IODINE + PLUTONIUM + RADIATION DAMAGE + RUTHENIUM + STRONTIUM + URANIUM + *TEST, WEAPONS + ZIRCONIUM + RADIATION INJURY TREATMENT + ACCIDENT, HYPOTHETICAL + *NUCLEAR DETONATION + DOSE CALCULATION, EXTERNAL + *CONTAMINATION + *RADIOACTIVITY RELEASE + TROPOSPHERE + *MILITARY CONSIDERATION + NUCLEAR ATTACK + FORECAST + REACTOR, THERMONUCLEAR + CONCENTRATION + *RADIATION EFFECT + *RADIATION EXPOSURE + LIVESTOCK + SKIN + CLOUD + SOCIO/PHILOSOPHICAL CONSIDERATION + HPIS

083078
PETERSON KR
DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
PNE-RB-42 +. 25 PAGES, JUNE 12, 1973

ENVIRONMENTAL STATEMENTS ISSUED FOR GAS-STIMULATION PROJECTS REQUIRE ESTIMATES OF SURFACE CONCENTRATIONS AND DOSE TO INDIVIDUALS FOR TRITIUM AND KR-85 FROM FLARING OF THE GAS AND FOR NOBLE GASES AND RADIO-IODINE FOR THE POSSIBLE, BUT UNLIKELY, 'SEEP' AFTER DETONATION. THE PURPOSE OF THIS PAPER IS TO DETAIL THE PROCEDURES USED AT LAWRENCE LIVERMORE LABORATORY IN ARRIVING AT CONCENTRATION AND DOSE ESTIMATES THAT HAVE BEEN PRINTED IN THE ENVIRONMENTAL STATEMENTS FOR RIO BLANCO (WASH-1519) AND WAGON WHEEL (WASH-1524).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + IODINE + KRYPTON + NOBLE GAS + *SURFACE CONTAMINATION + NUCLEAR DETONATION + *POPULATION EXPOSURE + *DOSE CALCULATION, EXTERNAL + *GAS + CONCENTRATION + *STIMULATION + RESOURCE, NATURAL + BENEFICIAL USE + STATEMENT, ENVIRONMENTAL

083710
METZ WD
MAGNETIC CONTAINMENT FUSION: WHAT ARE THE PROSPECTS?
3 PAGES, 1 REFERENCE, SCIENCE, 178(4058), PP. 291-293 (OCTOBER 20, 1972)

NONTECHNICAL REVIEW ARTICLE. NO DRAMATIC BREAKTHROUGHS HAVE OCCURRED RECENTLY IN THE PROGRAM OF FUSION BY MAGNETIC CONFINEMENT, AND CONTROLLED FUSION IS STILL FAR FROM A CERTAINTY. HOWEVER, MANY SCIENTISTS THINK THAT THE ANSWER TO THE QUESTION OF SCIENTIFIC FEASIBILITY WILL BE KNOWN WITHIN THE DECADE. IF THE COMPLEXITY OF THE FEASIBILITY EXPERIMENTS IS ANY INDICATION OF THE SOPHISTICATION OF A FUTURE FUSION REACTOR, THE DEVELOPMENT OF A COMMERCIAL REACTOR MAY BE AS HALTING AND TEDIOUS AS THE PROGRESS TOWARD PROVING THE PRINCIPLE.

SITING, REACTOR + *POPULATION EXPOSURE + *HAZARDS ANALYSIS + *FORECAST + *REACTOR, THERMONUCLEAR

085331
KESSER GM
SODIUM TECHNOLOGY FINAL REPORT
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-7997 +. 58 PAGES, TABLES, FIGURES, REFERENCES, APRIL 1973

THE REPORT COVERS THE FOLLOWING ACTIVITIES: (1) THE DESIGN OF A MULTIPURPOSE SAMPLER FOR USE AT FFTF. (2) THE PREPARATION OF ROT STANDARDS ON SPECIFICATIONS FOR MEASURING AND CONTROLLING THE PURITY OF SODIUM AND COVER GAS. (3) A COVER-GAS ANALYSIS SYSTEM FOR SEPARATING NE23 FROM NOBLE-GAS FISSION PRODUCTS. (4) DEVELOPMENT OF A CALCULATIONAL MODEL TO DESCRIBE THE GENERATION AND TRANSPORT OF TRITIUM IN AN LMFBR. (5) WORK HAS BEEN CONTINUED ON DEVELOPING POST-EXPOSURE TESTING METHODS, AND A MATHEMATICAL MODEL HAS BEEN USED TO PREDICT THE MAGNITUDE AND RATE OF CARBON MIGRATION IN REACTOR SODIUM SYSTEMS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION: SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CARBON + CODES AND STANDARDS + NOBLE GAS + SODIUM + ANALYTICAL MODEL + MASS TRANSFER + REACTOR, LMFBR + NEON + TECHNOLOGY + JACOBS

085479
STEINER D
THE NUCLEAR PERFORMANCE OF VANADIUM AS A STRUCTURAL MATERIAL IN FUSION REACTOR BLANKETS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4353 +. 34 PAGES, 16 TABLES, 2 FIGURES, 22 REFERENCES, OCTOBER 1973

THE AREAS CONSIDERED INCLUDE: (1) TRITIUM BREEDING; (2) NUCLEAR HEATING; (3) RADIATION EFFECTS RELATING TO MATERIAL DAMAGE; AND (4) NEUTRON-INDUCED ACTIVITY. IT IS CONCLUDED THAT: (1) THE TRITIUM BREEDING CHARACTERISTICS OF VANADIUM ARE SOMEWHAT SUPERIOR TO THOSE OF NIOBIUM; (2) NUCLEAR HEATING IN THE FIRST WALL OF THE BLANKET WILL BE SUBSTANTIALLY LOWER WITH VANADIUM THAN WITH NIOBIUM; (3) HELIUM AND HYDROGEN PRODUCTION IN THE FIRST WALL WILL BE SIGNIFICANTLY GREATER WITH VANADIUM THAN WITH NIOBIUM; AND (4) VANADIUM WILL EXHIBIT AN AFTERHEAT AND BIOLOGICAL HAZARD SEVERAL ORDERS OF MAGNITUDE LOWER THAN THAT OF NIOBIUM FOR TIMES-AFTER-SHUTDOWN OF ABOUT 100 DAYS AND GREATER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DEUTERIUM + NIOBIUM + STRUCTURAL INTEGRITY + VANADIUM + REACTOR, THERMONUCLEAR + PROPERTY, MECHANICAL

087968
GRATHWOHL G
PRODUCTION AND RELEASE OF TRITIUM BY NUCLEAR POWER PLANTS AND REPROCESSING PLANTS AND THE EXPECTED RADIOLOGICAL BURDEN TILL THE YEAR 2000
KERNFORSCHUNGSZETNRUM, INSTITUT FUR NEUTRONENPHYSIK AND REAKTORTECHNIC, KARLSRUHE, TERMANY
84 PAGES, 71 REFERENCES, FEBRUARY 1972

NATURAL TRITIUM PRODUCTION IS SUMMARIZED AS WELL AS YIELDS FROM NUCLEAR WEAPONS AND NUCLEAR FACILITIES. AN ESTIMATION OF TRITIUM INVENTORY FROM FUSION REACTORS IS ATTEMPTED. PRODUCTION RATES AND GLOBAL INVENTORY FOR THE YEAR 2000 ARE CALCULATED.

AVAILABILITY - KERNFORSCHUNGSZENTRUM, INSTITUT FUR NEUTRONENPHYSIK UND REAKTORTECHNIK, KARLSRUHE, GERMANY

REACTOR, POWER + GERMANY + FORECAST + REACTOR, THERMONUCLEAR + POLLUTION + INDUSTRY, NUCLEAR

087971
JAUHO P + MATTILA L
DISTRIBUTION OF TRITIUM IN A PRESSURIZED WATER POWER REACTOR PLANT
THE STATE INSTITUTE FOR TECHNICAL RESEARCH, FINLAND
7 PAGES, 1 TABLE, 5 FIGURES, 9 REFERENCES, NUCLEAR TECHNOLOGY, 16(3), PP. 472-478 (DECEMBER 1972)

A VERSATILE COMPUTER PROGRAM IS USED TO CALCULATE EFFECTS OF VARIATION IN SEVERAL REACTOR PLANT CONDITIONS ON DISTRIBUTION OF TRITIUM IN PRIMARY SYSTEMS PROCESS WATERS OF A WWER-TYPE PWR PLANT. WITHOUT AN ORGANIZED RELEASE, ALL STREAMS REACH AN EQUILIBRIUM SATURATION ACTIVITY OF ABOUT 15 MICROCURIES/CC. ANNUAL RELEASE OF ABOUT ONE PRIMARY CIRCUIT VOLUME IS REQUIRED TO KEEP TRITIUM ACTIVITY BELOW 0.5 MICROCURIES/CC. DATE OF RELEASE IS UNIMPORTANT AND MAY BE CHOSEN SO AS TO MINIMIZE RELEASE OF FISSION AND CORROSION PRODUCT ACTIVITIES.

*COMPUTER PROGRAM + FISSION GAS RELEASE + *REACTOR, PWR + *RADIOACTIVITY RELEASE

089425
MUSGRAVE BC
TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES
ALLIED CHEMICAL, NATIONAL REACTOR TESTING STATION
ICP-1041 +. 19 PAGES, 3 TABLES, 4 FIGURES, 8 REFERENCES, JANUARY 1974

TRITIUM WHICH IS PRODUCED FROM TERNARY FISSION IN NUCLEAR REACTORS WILL BE DILUTED AND DISPERSED THROUGHOUT THE AQUEOUS STREAMS IN THE FUEL REPROCESSING PLANTS. THE RANGES OF TRITIUM CONCENTRATIONS EXPECTED IN THE REPROCESSING PLANT STREAMS FOR DIFFERENT REACTOR TYPES ARE EXAMINED. THE REQUIREMENTS FOR TRITIUM CONTROL THROUGH RECYCLE AND ISOTOPE SEPARATION ARE DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT + FISSION GAS RELEASE + REACTOR, MOLTEN SALT + OCEAN AND SEA + SURFACE WATER + *WASTE DISPOSAL + WASTE MANAGEMENT + REACTOR, LWR + FUEL REPROCESSING + REACTOR, HTGR + REACTOR, LMFBR + JACOBS

091964
KABELE TJ
PARAMETRIC STUDY OF THE TRITIUM DISTRIBUTION IN THE FFTF
HANFORD ENGINEERING DEVELOPMENT LABORATORY
HEDL-TME 74-6 +. 24 PAGES, 4 TABLES, 1 FIGURE, 2 REFERENCES, FEBRUARY 1974

THIS PARAMETRIC STUDY INDICATES THAT TRITIUM RELEASE FROM THE FFTF CAN BE HELD TO LESS THAN 0.5 CI/DAY THROUGH EFFECTIVE COLD-TRAPPING OF THE SODIUM OF THE PRIMARY AND SECONDARY COOLANT SYSTEMS. THIS RELEASE LEVEL IS A FACTOR OF BETWEEN 100 AND 1000 TIMES LESS THAN THE ALLOWABLE STATUTORY RELEASE RATES FROM TRITIUM.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

SODIUM + *THERMAL EXPERIMENT + FFTF (TR) + FILTER, TRAP + REACTOR, LMFBR + JACOBS

092744
COMPERE EL + FREID SH + NESTOR CW
DISTRIBUTION AND RELEASE OF TRITIUM IN HIGH-TEMPERATURE GAS-COOLED REACTORS AS A FUNCTION OF DESIGN, OPERATIONAL, AND MATERIAL PARAMETERS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4303 +. 92 PAGES, TABLES, FIGURES, REFERENCES, JUNE 1974

TRITIUM WILL BE PRODUCED IN HIGH-TEMPERATURE GAS-COOLED REACTORS NOT ONLY BY FISSION, BUT ALSO TO A SIGNIFICANT EXTENT BY REACTIONS OF NEUTRONS WITH BORON IN BURNABLE POISON AND CONTROL RODS, WITH TRACE LITHIUM IMPURITY, AND WITH HE-3 OCCURRING NATURALLY IN THE HELIUM COOLANT FLOWING THROUGH THE CORE. A PORTION OF THE TRITIUM THAT IS FORMED IN SOLIDS OR FUEL MAY BE RELEASED TO THE COOLANT. THIS TRITIUM MINGLES WITH THE HYDROGEN IN THE COOLANT AND WILL, IN PART, CHEMISORB ON GRAPHITE. IN ADDITION, IT MAY LEAK WITH THE COOLANT FROM THE REACTOR VESSEL, BE REMOVED IN THE HELIUM PURIFICATION SYSTEM, OR PERMEATE SYSTEM WALLS INTO THE STEAM GENERATOR, WHERE AS A RESULT OF REMOVAL (BLOWDOWN) OR LOSSES IT IS SUBJECT TO RELEASE TO THE ENVIRONMENT.

092744 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + FISSION PRODUCT RELEASE + *REACTOR COOLANT + HELIUM + FT. ST. VRAIN (HTGR) + STEAM GENERATOR + REACTOR, HTGR + *DISTRIBUTION + JACOBS

093650
HTGR FUELS AND CORE DEVELOPMENT PROGRAM QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING AUGUST 30, 1974
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
GA-A13126 +. 139 PAGES, 45 FIGURES, SEPTEMBER 30, 1974

THE WORK REPORTED HERE INCLUDES STUDIES OF REACTIONS BETWEEN CORE MATERIALS AND COOLANT IMPURITIES, BASIC FISSION PRODUCT TRANSPORT MECHANISMS, CORE GRAPHITE DEVELOPMENT AND TESTING, THE DEVELOPMENT AND TESTING OF RECYCLABLE FUEL SYSTEMS, AND PHYSICS AND FUEL MANAGEMENT STUDIES. MATERIALS STUDIES INCLUDE IRRADIATION CAPSULE TESTS OF BOTH FUEL AND GRAPHITE. EXPERIMENTAL PROCEDURES AND RESULTS ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FISSION GAS RELEASE + GRAPHITE + TESTING + FISSION PRODUCT TRANSPORT + MATERIAL + IRRADIATION TESTING + XENON OSCILLATION + EXPERIMENT + *R AND D PROGRAM + *REACTOR, HTGR + FUEL MANAGEMENT + MODEL + JACOBS

095150
LENTSCH JW + HORNYIK K + TURNOCK RK
ACCUMULATION AND RELEASE OF TRITIUM IN PRESSURIZED WATER REACTORS FINAL REPORT
PORTLAND GENERAL ELECTRIC CO., OREGON
PGE-8001 +. 169 PAGES, 7 TABLES, 12 FIGURES, NOVEMBER 1973

MATHEMATICAL BASES, INPUT REQUIREMENTS, SAMPLE CALCULATIONAL RESULTS, AND PROGRAM LISTINGS ARE GIVEN FOR THE COMPUTER CODES TRIT AND THKK. TRIT EVALUATES TRITIUM CONCENTRATIONS ONLY AT THE END OF REACTOR POWER OPERATION AND REFUELING CYCLES, WHEREAS THKK CALCULATES TRITIUM INVENTORIES AT ANY DESIRED DAY OF STARTUP, POWER OPERATION, HOT SHUTDOWN, OR REFUELING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + *REACTOR, PWR + *TROJAN (PWR)

096216
MCNEESE LE + ROSENTHAL MW
MSBR: A REVIEW OF ITS STATUS AND FUTURE
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
7 PAGES, 3 FIGURES, 5 REFERENCES, NUCLEAR NEWS, 17(12), PP. 52-58 (SEPTEMBER 1974)

DESCRIBES THE REACTIVATED MOLTEN SALT BREEDER REACTOR PROGRAM. THE MAJOR UNCERTAINTY WITH REGARD TO ENVIRONMENTAL EFFECTS IS HOW TO LIMIT THE RATE AT WHICH TRITIUM ENTERS THE STEAM SYSTEM WHENCE IT IS RELEASED TO THE ENVIRONMENT. TRITIUM IS A SPECIAL PROBLEM BECAUSE OF ITS HIGH RATE OF PRODUCTION (2,400 CI/DAY IN A 1,000-MWE MSBR) FROM LITHIUM IN THE FUEL SALT AND BECAUSE OF ITS READY DIFFUSION THROUGH METALS AT MSBR TEMPERATURES. THE KINETIC BEHAVIOR OF MOLTEN-SALT REACTORS IS WELL UNDERSTOOD AND PREDICTABLE BY METHODS PROVED IN THE MSRE, AND THERE IS AMPLE BASIS FOR CONFIDENCE THAT DAMAGING NUCLEAR EXCURSIONS ARE HIGHLY IMPROBABLE. THE AFTERHEAT SITUATION IS ALSO UNIQUE. THE MAJOR HEAT SOURCE IS MUCH LESS INTENSE THAN IN SOLID-FUEL CORES BECAUSE IN AN MSBR THE BULK OF THE FISSION PRODUCTS IS INCORPORATED IN A LARGE MASS OF FUEL SALT.

REACTOR, BREEDER + DECAY HEAT + IODINE + *REACTOR, MOLTEN SALT + *REACTOR DESCRIPTION + REACTOR KINETICS + STRONTIUM + ACCIDENT, DESIGN BASIS + ENVIRONMENTAL PROTECTION AGENCY (EPA)

097671
KUMAR R
TRITIUM TRANSPORT IN AN LMFBR
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8089 +. 38 PAGES, 11 TABLES, 15 REFERENCES, AUGUST 1974

A COMPUTER MODEL HAS BEEN DEVELOPED TO SIMULATE THE TRANSPORTATION AND DISTRIBUTION OF TRITIUM IN A LIQUID-METAL-COOLED FAST BREEDER REACTOR (LMFBR). THE MODEL HAS BEEN SUCCESSFULLY USED TO CORRELATE TRITIUM DATA OBTAINED IN THE EXPERIMENTAL BREEDER REACTOR-II (EBR-II). PROJECTED TRITIUM DISTRIBUTIONS IN THE FAST FLUX TEST FACILITY (FFTF) HAVE BEEN CALCULATED FOR A RANGE OF VALUES OF THE MAJOR MODEL PARAMETERS. IT IS ESTIMATED THAT UNDER NORMAL OPERATION FFTF WILL RELEASE 3 TO 6 CI OF TRITIUM TO THE ENVIRONMENT PER DAY OF FULL POWER (400 MWT) OPERATION, COMPARED WITH THE NORMAL RELEASE FROM EBR-II OF ABOUT 4 MCI/DAY WHILE OPERATING AT 62.5 MWT.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

COMPUTER PROGRAM + EBR 1 AND 2 (RE) + FISSION PRODUCT RELEASE + RELEASE RATE + *FISSION PRODUCT TRANSPORT + FFTF (TR) + REACTOR, LMFBR + MODEL + JACOBS

099295
AUSTIN JH + ELLEMAN TS + VERGHESE K
SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-STAINLESS STEEL AND ZIRCALOY-2
NORTH CAROLINA STATE UNIVERISTY, RALEIGH
10 PAGES, 8 FIGURES, 16 REFERENCES, J. NUCLEAR MATERIALS, 48(3), PP. 307-316 (OCTOBER 1973)

TRITIUM DIFFUSION MEASUREMENTS FOLLOWING TRITIUM RECOIL INJECTION INTO AUSTENITIC STAINLESS STEELS AND ZIRCALOY-2 EXHIBIT SLOWER HYDROGEN TRANSPORT IN THE SURFACE REGIONS THAN IN THE BULK. KINETICS OF TRITIUM RELEASE FROM THESE MATERIALS INDICATE THAT THE RELEASE IS CONTROLLED BY A DIFFUSION COEFFICIENT THAT IS TWO TO THREE ORDERS OF MAGNITUDE LOWER THAN THE BULK DIFFUSION COEFFICIENT FOR TRITIUM IN STAINLESS STEEL AND SEVEN TO EIGHT ORDERS OF MAGNITUDE LOWER IN ZIRCALOY-2. A TWO-REGION CLASSICAL DIFFUSION MODEL WITH DIFFERENT DIFFUSION COEFFICIENTS IN EACH REGION HAS BEEN DEVELOPED WHICH APPEARS TO ADEQUATELY REPRESENT THE SURFACE DATA FOR SHORT HEATING TIMES. RELEASE RATES AT LONG HEATING TIMES ARE APPARENTLY INFLUENCED BY TRAPPING OF HYDROGEN IN SURFACE FILMS. THE SURFACE EFFECTS ARE SHOWN NOT TO BE DUE TO THE HELIUM WHICH IS INJECTED INTO THE SPECIMENS ALONG WITH THE TRITIUM.

DIFFUSION + HYDROGEN + ANALYTICAL MODEL + STEEL, STAINLESS + ZIRCALOY

099318
TREVORROW LE + KULLEN BJ + JARRY RL
TRITIUM AND NOBEL-GAS FISSION PRODUCTS IN THE NUCLEAR FUEL CYCLE
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8102 +, 79 PAGES, 25 TABLES, 24 FIGURES, OCTOBER 1974

A REVIEW OF THE BEHAVIOR OF TRITIUM AND NOBLE-GAS FISSION PRODUCTS IN NUCLEAR REACTORS IS PRESENTED. THE SOURCES OF TRITIUM CONSIDERED INCLUDE FISSION AND ACTIVATION OF POISONS AND IMPURITIES IN COOLANTS. THE NOBLE GASES INCLUDED IN THIS REVIEW ARE LIMITED TO FISSION PRODUCTS, WITH EMPHASIS ON THE LONG-LIVED SPECIES. REACTOR TYPES SURVEYED INCLUDE LIGHT WATER REACTORS, HIGH-TEMPERATURE GAS-COOLED REACTORS, AND LIQUID-METAL-COOLED FAST BREEDER REACTORS. DATA INDICATIVE OF THE NORMAL OPERATING PROCEDURES HAVE BEEN EXPANDED TO PROVIDE ESTIMATES OF THE QUANTITIES OF TRITIUM AND NOBLE GASES AND THEIR DILUENTS EXPECTED AT VARIOUS POINTS ALONG THE FLOW PATH FOR BOTH GASEOUS AND LIQUID WASTE STREAMS. DATA ARE NORMALIZED TO AN ENERGY OF 1000 MWE-YR TO PERMIT COMPARISON WITH PRESENT-GENERATION REACTORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + *FISSION PRODUCT RELEASE + *KRYPTON + REACTOR, PWR + *XENON + REACTOR, HTGR + REACTOR, LMFBR + FUEL CYCLE

099746
SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS
WESTINGHOUSE ELECTRIC CORP., PA.
WCAP-8253 +, 207 PAGES, JUNE 11, 1974

THIS IS A COMPILATION OF OPERATING PLANT DATA THROUGH JUNE 1973 WHICH IS APPLICABLE TO THE EVALUATION OF PWR RADWASTE TREATMENT SYSTEMS AND THE CALCULATION OF RADIOACTIVE EFFLUENT SOURCE TERMS. CONCENTRATIONS OF FISSION AND CORROSION PRODUCTS IN THE RCS, IODINE SEPARATION FACTOR, PRIMARY TO SECONDARY LEAK RATES, AND TRITIUM RELEASE DATA FROM OPERATING WESTINGHOUSE PWR'S ARE PRESENTED. AN EXPECTED I-131 CONCENTRATION MODEL HAS BEEN DEVELOPED WHICH IS OFFERED AS A REPLACEMENT FOR THE INFERRED FUEL DEFECT MODEL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DESIGN CRITERIA + EFFLUENT + FISSION PRODUCT, IODINE + *REACTOR, PWR + RELEASE RATE + *WASTE TREATMENT + ANALYTICAL MODEL + REACTOR COOLANT + CORROSION + FISSION PRODUCT ACTIVITY, GROSS + OPERATING EXPERIENCE + RADIATION SOURCE, INTERNAL + WESTINGHOUSE

100125
MILES CC + WEXLER S + EBERSOLE ER
TRITIUM RETENTION IN EBR-II-IRRADIATED BORON CARBIDE
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8107 +, 19 PAGES, 6 FIGURES, 13 REFERENCES, JUNE 1974

IRRADIATED BORON CARBIDE SAMPLES WERE ANALYZED AND SHOWED THAT ESSENTIALLY ALL THE TRITIUM PRODUCED BY THE NUCLEAR PROCESSES IS RETAINED BY THE BORON CARBIDE. RATES OF TRITIUM EVOLUTION AFTER IRRADIATION WERE MEASURED AND THE RESULTS INDICATE THAT TRITIUM IS SUBSTANTIALLY RETAINED IN B4C AT TEMPERATURES HIGHER THAN THOSE IN EBR-II, BUT CONSIDERABLE LOSS OCCURS AT TEMPERATURES ABOVE 700 C.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBIDE + *FISSION PRODUCT RETENTION + RETENTION

100305
SANDERS JP
HTGR SAFETY STUDIES PROGRESS REPORT FOR THE PERIOD ENDING DECEMBER 31, 1973
OAK RIDGE NATIONAL LABORATORY, TENNESSEE

100305 *CONTINUED*
ORNL-TM-4738 *. 41 PAGES, FIGURES, OCTOBER 1974

REPORTS PROGRESS DURING THE QUARTER CONCERNING: (1) THERMAL ANALYSIS AND CODE DEVELOPMENT, (2) COOLING SYSTEM PERFORMANCE DURING PAST SHUTDOWN OPERATION, AND (3) ANALYSIS OF TRITIUM DISTRIBUTION AND RELEASE IN THE HTGR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + THERMAL ANALYSIS + COOLING, SHUTDOWN + DESIGN STUDY + *R AND D PROGRAM + *REACTOR, HTGR

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

ABSORPTION
065652 P 23 068566 P 25 074536 P 28 075295 P 28
076900 P 30
ACCELERATOR
013202 P 4 027648 P 7 033070 P 9 061540 P 18
077311 P 33
ACCIDENT, DESIGN BASIS
096216 P 39
ACCIDENT, HYPOTHETICAL
062229 P 19 063263 P 20 065652 P 23 082319 P 36
ACCIDENT, PROBABILITY OF
038161 P 11
ACID
066877 P 24
ACTIVATION
011481 P 3
ACTIVATION PRODUCT
021802 P 11 036855 P 10 065493 P 22 066877 P 24
ACTIVITY BUILDUP
030690 P 8 037466 P 11 044524 P 14
ADDITIVE
062398 P 19
ADMINISTRATIVE CONTROL
036855 P 10 044967 P 14 072593 P 27
AGENCY, AEC
007171 P 1 015896 P 5 027527 P 6
AGENCY, MUNICIPAL
044068 P 13
AGRICULTURE
045400 P 15
AIR
052569 P 16 052691 P 17 062087 P 18 064785 P 21
064787 P 22 064889 P 22 082317 P 36
AIRBORNE RELEASE
030457 P 8 030475 P 8 055111 P 17 066363 P 23
ALPHA EMITTER
082317 P 36
ANALYTICAL MODEL
085331 P 37 099295 P 39 099746 P 40
ANALYTICAL TECHNIQUE
027977 P 7 030690 P 8 036429 P 10 036855 P 10
055111 P 17 077129 P 31
ANIMAL, FISH
045016 P 14
ANIMAL, SPONGE
030487 P 8
ANIMAL, VERTEBRATE
064785 P 21 064787 P 22
AQUATIC ORGANISM
043979 P 13 045018 P 15
ARGON
030690 P 8 038161 P 11 065493 P 22 077129 P 31
ATMOSPHERIC CHEMISTRY
013067 P 3 030682 P 8
ATMOSPHERIC CIRCULATION, GLOBAL
013282 P 4
ATMOSPHERIC DIFFUSION, CLIMATOLOGY
030457 P 8 030475 P 8
ATMOSPHERIC DIFFUSION, GLOBAL
025598 P 6
ATMOSPHERIC POLLUTION
010702 P 2 013067 P 3 030457 P 8 030475 P 8
030682 P 8 038161 P 11 044967 P 14 075576 P 29
076899 P 30 076901 P 31
BEHAVIOR
037402 P 10
BENEFICIAL USE
031269 P 9 066877 P 24 068115 P 25 078884 P 33
083078 P 37
BENEFICIAL USE, COMMERCIAL
067892 P 24 068566 P 25
BENEFIT VS RISK
012417 P 3 031269 P 9 070395 P 26 077194 P 32
078884 P 33
BERYLLIUM
011481 P 3 061540 P 18 065652 P 23 077311 P 33
080977 P 35
BETA EMITTER
036855 P 10 064889 P 22
BIG ROCK POINT (BWR)
005375 P 1
BIOACCUMULATION/TURNOVER
045400 P 15 075576 P 29
BIOCHEMICAL
065652 P 23
BIOLOGICAL CONTROL
043979 P 13 065652 P 23
BIOLOGICAL HALF-LIFE
064785 P 21
BIOMASS
064787 P 22
BIOMEDICAL
044674 P 14 055111 P 17 075647 P 29
BIOTA
065953 P 23
BLOOD
064785 P 21
BNL
064889 P 22
BONE
064785 P 21
BORON
020575 P 6 030487 P 8 047843 P 16 062398 P 19
BYPRODUCT MATERIAL
010982 P 2
CALCIUM
065493 P 22
CALIBRATION
030690 P 8
CALVERT CLIFFS 1 (PWR)
043979 P 13
CANADA
005375 P 1 075295 P 28
CANCER
038161 P 11
CARBIDE
100125 P 40
CARBON
002706 P 1 025598 P 6 031269 P 9 038161 P 11
052569 P 16 052691 P 17 062170 P 19 064785 P 21
077129 P 31 085331 P 37
CARBON DIOXIDE
030690 P 8 080690 P 34
CERIUM
080825 P 35 082319 P 36
CESIUM
014384 P 4 025598 P 6 038161 P 11 043979 P 13
058861 P 18 082317 P 36 082319 P 36
CHALK RIVER
044674 P 14
CHEMICAL ANALYSIS
036429 P 10
CHEMICAL KINETICS
030682 P 8
CHEMICAL REACTION
030682 P 8 077311 P 33
CHEMICAL SHIM
037466 P 11
CHROMATOGRAPHY
030129 P 7 030690 P 8 077129 P 31
CLADDING
047843 P 16 080708 P 35
CLOUD
076901 P 31 082319 P 36
COATING
011521 P 3
CODES AND STANDARDS
043979 P 13 044967 P 14 045016 P 14 067891 P 24
068566 P 25 072593 P 27 085331 P 37
COMMUNITY, AQUATIC
077109 P 31
COMPARISON
063905 P 21 064889 P 22 075431 P 28 077143 P 31
081698 P 36
COMPARISON, THEORY AND EXPERIENCE
025598 P 6 030487 P 8
COMPLIANCE
010982 P 2
COMPONENT DESCRIPTION
076136 P 30

COMPUTER PROGRAM
014734 P 5 087971 P 38 092744 P 38 095150 P 39
097671 P 39 100305 P 40
COMPUTER, DIGITAL
014734 P 5
CONCENTRATION
007171 P 1 016916 P 5 027977 P 7 031269 P 9
045016 P 14 058861 P 18 062087 P 18 062170 P 19
062229 P 19 063905 P 21 064413 P 21 064785 P 21
067891 P 24 068566 P 25 072991 P 27 074536 P 28
076284 P 30 076899 P 30 076900 P 30 076901 P 31
077143 P 31 077193 P 32 077194 P 32 077311 P 33
078884 P 33 080427 P 34 082317 P 36 082319 P 36
083078 P 37
CONDENSATION
030129 P 7
CONGRESSIONAL ACTIVITY
043979 P 13
CONSTRUCTION
076136 P 30
CONSUMER PRODUCT
036038 P 9 055112 P 17 062170 P 19 062229 P 19
067892 P 24 068566 P 25 075681 P 29 077196 P 32
CONTAINMENT
005375 P 1 075681 P 29
CONTAINMENT LEAKAGE CONTROL
075295 P 28
CONTAINMENT R AND D
044674 P 14
CONTAINMENT STRUCTURE
044524 P 14
CONTAINMENT, HIGH PRESSURE
005375 P 1
CONTAINMENT, LOW PRESSURE
005375 P 1
CONTAINMENT, UNDERGROUND
013067 P 3 038862 P 12 063905 P 21 077196 P 32
078884 P 33
CONTAMINATION
027527 P 6 027648 P 7 033070 P 9 045077 P 15
045079 P 15 055112 P 17 061540 P 18 064413 P 21
066877 P 24 067892 P 24 072991 P 27 074536 P 28
077143 P 31 077311 P 33 078884 P 33 082319 P 36
CONTROL ROD DRIVE MECHANISMS
005375 P 1
CONTROL ROD SCRAM MECHANISM
041509 P 12
CONTROL RODS
030487 P 8
COOK 1 (PWR)
044068 P 13
COOLANT CHEMISTRY
030690 P 8 037466 P 11 040046 P 12 062398 P 19
COOLANT PURIFICATION SYSTEM
062380 P 19 062398 P 19
COOLANT QUALITY
040008 P 12
COOLING DEVICE
063703 P 20
COOLING TOWER
062380 P 19
COOLING, SHUTDOWN
100305 P 40
COPPER
066877 P 24
CORRELATION
064785 P 21
CORROSION
062398 P 19 066435 P 23 099746 P 40
COSMIC RADIATION
045079 P 15
COST, CAPITAL
069928 P 25
COUNTER
036855 P 10 040046 P 12 076284 P 30
CRITICAL NUCLIDE PATHWAY
013067 P 3 045400 P 15 062170 P 19 075295 P 28
075576 P 29 081331 P 36
CRITICALITY EXPERIMENT
005375 P 1
CROSS SECTION
076284 P 30 080416 P 33 080825 P 35
CRUSTACEAN
043979 P 13
DATA COLLECTION
012417 P 3 038161 P 11 043979 P 13 045018 P 15
064889 P 22 075431 P 28
DECAY HEAT
096216 P 39
DECONTAMINATION
047843 P 16 061133 P 18 066877 P 24 067892 P 24
068115 P 25 080626 P 34
DEPOSITION
030129 P 7 065652 P 23 076284 P 30 082319 P 36
DESIGN CRITERIA
030487 P 8 099746 P 40
DESIGN STUDY
100305 P 40
DEUTERIUM
030475 P 8 040046 P 12 041509 P 12 044524 P 14
063662 P 20 075647 P 29 077194 P 32 085479 P 37
DIETARY HABIT
064785 P 21 081331 P 36
DIFFUSION
027527 P 6 030129 P 7 047843 P 16 051840 P 16
080708 P 35 099295 P 39
DIFFUSION COEFFICIENT
011481 P 3
DILUTION
030129 P 7 061540 P 18 077311 P 33
DIRECT ENERGY CONVERSION DEVICES
076136 P 30
DISPERSION
030129 P 7
DISTRIBUTION
064785 P 21 076284 P 30 092744 P 38
DOSE
016916 P 5 045018 P 15 053739 P 17 062087 P 18
075295 P 28 079069 P 33 082317 P 36 083078 P 37
DOSE CALCULATION, EXTERNAL
016916 P 5 023290 P 6 062170 P 19 062229 P 19
063905 P 21 079069 P 33 082319 P 36 083078 P 37
DOSE CALCULATION, INTERNAL
016916 P 5 023290 P 6 045400 P 15
DOSE MEASUREMENT, EXTERNAL
055112 P 17
DOSIMETRY
062229 P 19 080825 P 35
DRY
075295 P 28
EBR 1 AND 2 (RE)
097671 P 39
ECOLOGY
016916 P 5 036443 P 10 037402 P 10 044524 P 14
044674 P 14 075576 P 29
ECONOMICS
005375 P 1 009797 P 2 012417 P 3 038862 P 12
063263 P 20 069928 P 25
ECOSYSTEM, AQUATIC
075576 P 29
ECOSYSTEM, DESERT
068115 P 25
ECOSYSTEM, ESTUARINE
075576 P 29
ECOSYSTEM, MARINE
075576 P 29
ECOSYSTEM, MODEL
075576 P 29
EFFECT, GENETIC
043979 P 13 077143 P 31
EFFECT, PH
062398 P 19
EFFECT, SOMATIC
077143 P 31
EFFLUENT
015305 P 5 036443 P 10 044967 P 14 064889 P 22
067891 P 24 076900 P 30 077109 P 31 077129 P 31
080427 P 34 081331 P 36 081698 P 36 089425 P 38
099746 P 40
EGG
064785 P 21
ELECTRIC POWER
063263 P 20 063662 P 20 074325 P 27 076136 P 30
ELECTROSTATIC CHARGE
030682 P 8
ELEMENTS AND ISOTOPES
072593 P 27 077109 P 31 078884 P 33
ELK RIVER (BWR)
005375 P 1
ENEA
072593 P 27
ENERGY LEVEL
002706 P 1 033070 P 9
ENERGY PREDICTION
080427 P 34
ENERGY SPECTRUM
077194 P 32
ENVIRONMENT
023290 P 6 030129 P 7 036855 P 10 037402 P 10
044674 P 14 044967 P 14 045077 P 15 045079 P 15
047843 P 16 062087 P 18 063263 P 20 063703 P 20
063905 P 21 066363 P 23 070395 P 26 072991 P 27

075295 P 28 075431 P 28 075576 P 29 076900 P 30
079069 P 33 080427 P 34 081061 P 35 081331 P 36
ENVIRONMENTAL CONTROL MEASURE
080427 P 34
ENVIRONMENTAL PROTECTION AGENCY (EPA)
096216 P 39
EQUATION
016916 P 5
EQUILIBRIUM
002706 P 1
EQUIPMENT DESIGN
044524 P 14
EQUIPMENT DEVELOPMENT
051840 P 16
EURATOM
075576 P 29
EVAPORATION
030129 P 7 037402 P 10
EXCAVATION, NUCLEAR
012417 P 3 045400 P 15 065493 P 22
EXCRETION, URINE
027977 P 7
EXPERIMENT
010526 P 2 063662 P 20 093650 P 39
EXPLOSION
044524 P 14 067566 P 24 080690 P 34
EXPOSURE, BACKGROUND
064785 P 21 064787 P 22 064889 P 22 079069 P 33
FAILURE, FATIGUE
074978 P 28
FALLOUT
013067 P 3 013282 P 4 016916 P 5 025598 P 6
027527 P 6 044674 P 14 052569 P 16 052691 P 17
064785 P 21 072991 P 27 077109 P 31 079069 P 33
082319 P 36
FFTF (TR)
091964 P 38 097671 P 39
FILTER, TRAP
014384 P 4 091964 P 38
FIRE
067566 P 24
FISSION GAS RELEASE
010526 P 2 010702 P 2 030690 P 8 030778 P 9
045018 P 15 047843 P 16 065493 P 22 068766 P 25
081061 P 35 087971 P 38 089425 P 38 093650 P 39
FISSION PRODUCT ACTIVITY, GROSS
081698 P 36 099746 P 40
FISSION PRODUCT RELEASE
012417 P 3 020575 P 6 025055 P 6 045016 P 14
045018 P 15 049348 P 16 052407 P 16 062087 P 18
064412 P 21 068766 P 25 072991 P 27 077193 P 32
077194 P 32 077196 P 32 077197 P 32 082317 P 36
082319 P 36 092744 P 38 097671 P 39 099318 P 40
FISSION PRODUCT RETENTION
064412 P 21 100125 P 40
FISSION PRODUCT TRANSPORT
014384 P 4 066435 P 23 072991 P 27 080708 P 35
081331 P 36 093650 P 39 097671 P 39
FISSION PRODUCT, AIRBORNE
044524 P 14
FISSION PRODUCT, IODINE
099746 P 40
FISSION PRODUCT, VOLATILE
020575 P 6 037466 P 11
FLUORIDE
062398 P 19 066435 P 23
FOOD
082317 P 36
FOOD CHAIN
043979 P 13 074536 P 28 075295 P 28 075576 P 29
081331 P 36
FOOD INTAKE
064785 P 21
FORECAST
062087 P 18 066363 P 23 067566 P 24 069928 P 25
075576 P 29 077193 P 32 077195 P 32 079069 P 33
080427 P 34 081331 P 36 082319 P 36 083710 P 37
087968 P 38
FRC
016916 P 5 043979 P 13 045016 P 14 062229 P 19
FT. ST. VRAIN (HTGR)
092744 P 38
FUEL BURNUP
036242 P 10 044158 P 13 072213 P 26 072363 P 27
080708 P 35 080825 P 35
FUEL CYCLE
077109 P 31 099318 P 40
FUEL ELEMENTS
080708 P 35 082317 P 36
FUEL HANDLING
005375 P 1 082317 P 36
FUEL MANAGEMENT
075888 P 29 093650 P 39
FUEL REPROCESSING
010526 P 2 010702 P 2 023290 P 6 030129 P 7
036242 P 10 043979 P 13 045016 P 14 045079 P 15
058861 P 18 072213 P 26 072593 P 27 077109 P 31
079069 P 33 080626 P 34 081061 P 35 081331 P 36
082317 P 36 089425 P 38
FUEL STORAGE
082317 P 36
FUEL, FOSSIL
045400 P 15 055988 P 17 063905 P 21 080427 P 34
GAMMA EMITTER
014384 P 4 064889 P 22
GAS
007171 P 1 031269 P 9 033070 P 9 036429 P 10
055112 P 17 061133 P 18 062170 P 19 062229 P 19
063905 P 21 064787 P 22 064889 P 22 065493 P 22
067892 P 24 068566 P 25 072136 P 26 076901 P 31
077129 P 31 077143 P 31 077196 P 32 078884 P 33
083078 P 37
GEOLOGY
064413 P 21
GERMANY
030475 P 8 036242 P 10 043845 P 13 043846 P 13
087968 P 38
GETR (TR)
030487 P 8
GRAPHITE
066435 P 23 080416 P 33 093650 P 39
GROSS BETA
062398 P 19
GROSS GAMMA
062398 P 19
GROUND WATER
027527 P 6 030129 P 7 077311 P 33
GROUND WATER, NUCLIDE OCCURRENCE
061540 P 18
GUIDE
036855 P 10
HALLAM (LMR)
005375 P 1
HANFORD SITE
044674 P 14
HAZARD, RELATIVE
007399 P 1 030487 P 8 033070 P 9 036855 P 10
038161 P 11 044967 P 14 045077 P 15 063263 P 20
064412 P 21 065652 P 23 081698 P 36
HAZARDS ANALYSIS
007399 P 1 013202 P 4 014734 P 5 027977 P 7
044524 P 14 045400 P 15 064412 P 21 066363 P 23
069928 P 25 081698 P 36 083710 P 37
HEART
064785 P 21
HEAT EXCHANGERS
021802 P 11
HEAT GENERATION, INTERNAL
044524 P 14
HEAT SINK
069928 P 25
HEAT TRANSFER
004683 P 1
HEAVY WATER
040008 P 12 061133 P 18
HELIUM
062380 P 19 067566 P 24 080977 P 35 092744 P 38
HIGH
033070 P 9
HPIS
077109 P 31 077143 P 31 077193 P 32 077196 P 32
077197 P 32 082317 P 36 082319 P 36
HYDRAULIC EFFECT
005375 P 1
HYDRAULIC EXPERIMENT
011152 P 2
HYDRIDE
062398 P 19
HYDROGEN
076901 P 31 080690 P 34 080708 P 35 099295 P 39
HYDROLOGY
027527 P 6 030129 P 7 037402 P 10 061540 P 18
081331 P 36
IAEA
005375 P 1
ICRP
012417 P 3 043979 P 13 072593 P 27
IMPOUNDMENT
068115 P 25
IN PILE EXPERIMENT
080977 P 35
INCIDENT COMPILATION

012417 P 3
INCIDENT, CONSEQUENCE
012417 P 3
INCIDENT, NONNUCLEAR
065652 P 23
INCINERATION
062229 P 19
INDUSTRY, MINING
055988 P 17
INDUSTRY, NUCLEAR
043979 P 13 045016 P 14 049348 P 16 080427 P 34
087968 P 38
INDUSTRY, TRANSPORTATION
063662 P 20
INGESTION
016916 P 5 036855 P 10 037466 P 11 064785 P 21
065652 P 23 082319 P 36
INHALATION
016916 P 5 027977 P 7 037466 P 11 045400 P 15
064785 P 21 065652 P 23 068566 P 25 082319 P 36
INSTRUMENT, COOLANT QUALITY
030690 P 8
INSTRUMENT, LIQUID LEVEL
041509 P 12
INSTRUMENT, NUCLEAR
005375 P 1
INSTRUMENTS, MISC.
014463 P 4 062087 P 18
INSURANCE
012417 P 3
INTERNATIONAL
012417 P 3 038161 P 11
INVERSION
045400 P 15
IODINE
014384 P 4 016916 P 5 036242 P 16 038161 P 11
044967 P 14 062398 P 19 075295 P 28 077129 P 31
081331 P 36 082319 P 36 082078 P 37 096216 P 39
ION EXCHANGE
051840 P 16 062398 P 19
IRRADIATION TESTING
093650 P 39
ISOTOPIC FRACTIONATION
065493 P 22
JACOBS
030129 P 7 085331 P 37 089425 P 38 091964 P 38
092744 P 38 093650 P 39 097671 P 39
KIDNEY
064785 P 21
KRYPTON
002706 P 1 010526 P 2 010702 P 2 012417 P 3
014384 P 4 023290 P 6 030690 P 8 031269 P 9
036038 P 9 036429 P 10 038161 P 11 043979 P 13
044967 P 14 045016 P 14 045018 P 15 045077 P 15
062087 P 18 062170 P 19 062380 P 19 063905 P 21
065953 P 23 068566 P 25 072136 P 26 072593 P 27
075431 P 28 077129 P 31 077143 P 31 078884 P 33
079069 P 33 080427 P 34 082317 P 36 083078 P 37
099318 P 40
LANTHANUM
080825 P 35
LASER
063662 P 20 074578 P 28
LEACHING
066877 P 24
LEAK
010982 P 2 040008 P 12 047843 P 16
LEAK RATE
043645 P 13 043646 P 13
LEGISLATION
012417 P 3
LIQUID
036855 P 10 064989 P 22 072136 P 26
LITHIUM
047843 P 16 063652 P 20 063703 P 20 074325 P 27
075647 P 29 077194 P 32 080697 P 34
LITIGATION
044068 P 13
LIVER
064785 P 21 065652 P 23
LIVESTOCK
082319 P 36
LRL
007171 P 1
LUNG
065652 P 23
LYMPH NODE
065652 P 23
MAIN COOLING SYSTEM
014734 P 5 037466 P 11 040008 P 12
MAINTENANCE AND REPAIR
030778 P 9 080697 P 34
MAINTENANCE, REMOTE
080697 P 34
MAMMAL
045016 P 14
MAN
016916 P 5 027977 P 7 045016 P 14 062087 P 18
064785 P 21 076900 P 30 082317 P 36
MASS TRANSFER
080697 P 34 085331 P 37
MATERIAL
076136 P 30 093650 P 39
MATHEMATICAL TREATMENT
016916 P 5 075888 P 29
MEASUREMENT
058861 P 18 072991 P 27 077194 P 32 078884 P 33
MERCURY
031269 P 9
METAL, LIQUID
014384 P 4 080697 P 34
METEOROLOGY
062229 P 19 065652 P 23 081331 P 36
MILITARY CONSIDERATION
065652 P 23 082319 P 36
MILK
064785 P 21
MINING
066877 P 24
MIXING DEPTH
076284 P 30
MODEL
061540 P 18 093650 P 39 097671 P 39
MODEL, DETERMINISTIC
075576 P 29 076284 P 30
MOLECULAR SIEVE
075295 P 28
MOLTEN FUEL
066435 P 23 072363 P 27
MONITOR
077194 P 32
MONITOR, AIR
031269 P 9 055111 P 17
MONITOR, AREA
031269 P 9 081331 P 36 081698 P 36
MONITOR, BACKGROUND
031269 P 9
MONITOR, ENVIRONMENTAL
016916 P 5 067891 P 24 077193 P 32
MONITOR, GAS
027648 P 7 031269 P 9 068566 P 25 077129 P 31
MONITOR, LIQUID
031269 P 9 041509 P 12 055111 P 17
MONITOR, NUCLEAR DETONATION
064787 P 22
MONITORING PROGRAM, ENVIRONMENTAL
025598 P 6 058861 P 18
MONITORING SYSTEM, RADIATION
027977 P 7 055111 P 17 075647 P 29
MPC
061540 P 18 064412 P 21 070395 P 26 077129 P 31
077143 P 31
MPD
064412 P 21
MSBR (RE)
072363 P 27
MSRE (RE)
072363 P 27
N-POWER FORECAST
012417 P 3 062087 P 18 065953 P 23 080427 P 34
N-POWER, SAFETY OF
012417 P 3 038161 P 11 063263 P 20 063703 P 20
NBS
041509 P 12
NCRP
043979 P 13
NEON
085331 P 37
NEUTRON
013202 P 4 020575 P 6 025055 P 6 033070 P 9
066877 P 24
NFS
045016 P 14 058861 P 18
NIOBIUM
080416 P 33 081698 P 36 085479 P 37
NITROGEN
021802 P 11
NOBLE GAS
014384 P 4 021802 P 11 030690 P 8 066435 P 23
075295 P 28 075576 P 29 083078 P 37 085331 P 37
NORWAY
040008 P 12

NRC REGULATORY GUIDE
077129 P 31
NUCLEAR ATTACK
082319 P 36
NUCLEAR DETONATION
002706 P 1 007171 P 1 016916 P 5 025598 P 6
027527 P 6 031269 P 9 036429 P 10 038862 P 12
045079 P 15 055112 P 17 062087 P 18 063905 P 21
064412 P 21 064413 P 21 065493 P 22 066877 P 24
067892 P 24 068115 P 25 075681 P 29 076899 P 30
076901 P 31 077109 P 31 077196 P 32 077197 P 32
078884 P 33 080427 P 34 080626 P 34 082319 P 36
083078 P 37
NUCLEAR DEVICE AND EQUIPMENT
012417 P 3
NUCLEAR EXPLOSION DEBRIS
013067 P 3 016916 P 5
OCEAN AND SEA
030129 P 7. 076284 P 30 076899 P 30 089425 P 38
OCEAN, PACIFIC
067891 P 24
OFF GAS
036242 P 10
OPERATING EXPERIENCE
021802 P 11 064889 P 22 099746 P 40
OPERATING EXPERIENCE SUMMARY
005375 P 1 040008 P 12
OPPONENT
043979 P 13 044068 P 13
ORE CONVERSION
066877 P 24
ORGANIZATION, CITIZEN
045016 P 14
ORGANIZATION, INTERNATIONAL
075576 P 29
ORNL
023290 P 6
OUT OF PILE EXPERIMENT
014384 P 4
OXIDE
080977 P 35
PARAMETER
047843 P 16
PARTICLE
064889 P 22
PATHFINDER (ISR)
005375 P 1
PEACH BOTTOM 1 (HTGR)
005375 P 1
PERSONNEL EXPOSURE, RADIATION
007399 P 1 016916 P 5 037466 P 11 055112 P 17
082317 P 36
PHOSPHORUS
077311 P 33
PHYSICOCHEMICAL FORM
077143 P 31
PHYSIOLOGY/METABOLISM
064785 P 21 064787 P 22
PIQUA (OCR)
005375 P 1 011152 P 2
PLANT
052407 P 16
PLASMA
074325 P 27 080697 P 34
PLOWSHARE
007171 P 1 036429 P 10 038117 P 11 038862 P 12
045400 P 15 051840 P 16 055112 P 17 055988 P 17
062087 P 18 062170 P 19 062229 P 19 063905 P 21
064787 P 22 065493 P 22 068566 P 25 075681 P 29
077196 P 32 078884 P 33 080427 P 34 080690 P 34
PLUME BEHAVIOR
045400 P 15
PLUTONIUM
064412 P 21 065652 P 23 072213 P 26 080416 P 33
080825 P 35 082317 P 36 082319 P 36
PM 1 (PWR)
014734 P 5 020575 P 6
PM 2A (PWR)
020575 P 6
PM 3A (PWR)
014734 P 5 020575 P 6
POISON, SOLUBLE
047843 P 16
POLLUTION
062087 P 18 075431 P 28 075576 P 29 087968 P 38
POPULATION DISTRIBUTION
081331 P 36
POPULATION EXPOSURE
012417 P 3 030129 P 7 026855 P 10 038161 P 11
038862 P 12 055988 P 17 061864 P 18 062087 P 18
062170 P 19 062229 P 19 064412 P 21 064785 P 21
064787 P 22 074536 P 28 076900 P 30 077143 P 31
078884 P 33 080427 P 34 081331 P 36 082317 P 36
083078 P 37 083710 P 37
POWER GENERATION METHOD
075647 P 29
POWER PLANT, FOSSIL FUEL
045400 P 15 062087 P 18
POWER PLANT, NUCLEAR
038161 P 11 077129 P 31 077195 P 32
POWER TRANSMISSION
063263 P 20
PRECIPITATION
037402 P 10 076899 P 30
PRESSURE PULSE
074978 P 28
PRESSURE VESSELS
005375 P 1 030487 P 8 063662 P 20
PROCEDURES AND MANUALS
043845 P 13 043846 P 13
PRODUCTION
061864 P 18 065472 P 22 072136 P 26 074326 P 28
075888 P 29 077193 P 32 077194 P 32 077195 P 32
077196 P 32 077197 P 32 081698 P 36
PRODUCTION, RATE
061864 P 18
PROMETHIUM
036038 P 9
PROPERTY, CHEMICAL
030487 P 8
PROPERTY, MECHANICAL
085479 P 37
PROPERTY, PHYSICAL
030487 P 8
PROTECTIVE ACTION GUIDE
062229 P 19
R AND D PROGRAM
061133 P 18 063662 P 20 066363 P 23 076136 P 30
093650 P 39 100305 P 40
RADIATION DAMAGE
036242 P 10 063703 P 20 065603 P 23 079069 P 33
082319 P 36
RADIATION EFFECT
012417 P 3 037466 P 11 045018 P 15 049348 P 16
065652 P 23 066363 P 23 079069 P 33 081331 P 36
082319 P 36
RADIATION EXPOSURE
055988 P 17 070395 P 26 079069 P 33 082317 P 36
082319 P 36
RADIATION IN PERSPECTIVE
055988 P 17 065953 P 23 070395 P 26
RADIATION INJURY TREATMENT
082319 P 36
RADIATION MONITORS
030129 P 7
RADIATION SAFETY AND CONTROL
002706 P 1 016916 P 5 027527 P 6 027977 P 7
030129 P 7 030487 P 8 030778 P 9 038862 P 12
044967 P 14 064412 P 21 066363 P 23 068566 P 25
072136 P 26 077193 P 32 080626 P 34 082317 P 36
RADIATION SOURCE, INTERNAL
099746 P 40
RADIATION, PUBLIC EDUCATION
064787 P 22
RADIOACTIVITY RELEASE
011521 P 3 012417 P 3 030129 P 7 031269 P 9
033070 P 9 037402 P 10 038161 P 11 038862 P 12
043845 P 13 043846 P 13 043979 P 13 044524 P 14
044967 P 14 045016 P 14 045018 P 15 047843 P 16
058861 P 18 061540 P 18 062087 P 18 062229 P 19
063263 P 20 063703 P 20 064412 P 21 064889 P 22
065603 P 23 067891 P 24 068766 P 25 069957 P 26
070395 P 26 074536 P 28 075431 P 28 075681 P 29
076136 P 30 077109 P 31 077193 P 32 077196 P 32
080626 P 34 081331 P 36 081698 P 36 082319 P 36
087971 P 38
RADIOCHEMICAL ANALYSIS
007171 P 1
RADIOCHEMICAL PLANT SAFETY
010702 P 2
RADIOISOTOPE
044158 P 13 044674 P 14 052569 P 16 052691 P 17
053739 P 17 067891 P 24 072593 P 27
RADIOLOGICAL ASSISTANCE
077143 P 31
RADIOLYTIC GAS
077129 P 31
RADIONUCLIDE TRANSFER
013067 P 3 044674 P 14 045400 P 15 074536 P 28
RADIONUCLIDE UPTAKE
045016 P 14 045400 P 15 064785 P 21 064787 P 22
065953 P 23 068115 P 25 074326 P 28 074[illegible] P 28

075295 P 28 075576 P 29
RADIONUCLIDE, INDUCED
065603 P 23 067566 P 24 080977 P 35
RADON
078884 P 33
RAINOUT
013067 P 3 013282 P 4 030129 P 7
REACTIVITY COEFFICIENT
041509 P 12
REACTIVITY EFFECT
004683 P 1 005375 P 1
REACTOR
036855 P 10 053739 P 17 077195 P 32
REACTOR COOLANT
037466 P 11 047843 P 16 052744 P 38 099746 P 40
REACTOR DESCRIPTION
076136 P 30 096216 P 39
REACTOR KINETICS
096216 P 39
REACTOR PHYSICS
044158 P 13 063703 P 20
REACTOR POWER
002706 P 1 045079 P 15 067891 P 24
REACTOR STARTUP TESTING
005375 P 1
REACTOR, BREEDER
077195 P 32 096216 P 39
REACTOR, BWR
005375 P 1 009797 P 2 030487 P 8 040008 P 12
061864 P 18 065472 P 22 068766 P 25 077195 P 32
099318 P 40
REACTOR, FAST
011152 P 2 080825 P 35
REACTOR, GCR
005375 P 1
REACTOR, HTGR
062380 P 19 068766 P 25 077195 P 32 089425 P 38
092744 P 38 093650 P 39 099318 P 40 100305 P 40
REACTOR, HWR
009797 P 2 015305 P 5 027977 P 7 040008 P 12
077195 P 32
REACTOR, INTERACTING
043845 P 13 043846 P 13
REACTOR, INTERNAL SUPERHEAT
030487 P 8
REACTOR, LMCR
005375 P 1 011152 P 2 014384 P 4
REACTOR, LMFBR
069594 P 25 076136 P 30 077195 P 32 080708 P 35
080825 P 35 085231 P 37 089425 P 38 091964 P 38
097671 P 39 099318 P 40
REACTOR, LWR
089425 P 38
REACTOR, MILITARY
014734 P 5 020575 P 6
REACTOR, MOLTEN SALT
072363 P 27 077195 P 32 089425 P 38 096216 P 39
REACTOR, ORGANIC COOLED
005375 P 1 011152 P 2
REACTOR, POOL TYPE
043845 P 13 043846 P 13
REACTOR, POWER
012417 P 3 025055 P 6 030129 P 7 030778 P 9
036443 P 10 037466 P 11 043979 P 13 044068 P 13
045018 P 15 049348 P 16 063905 P 21 064889 P 22
069957 P 26 072593 P 27 072991 P 27 076900 P 30
077109 P 31 077194 P 32 079069 P 33 080427 P 34
080626 P 34 081331 P 36 081698 P 36 087968 P 38
REACTOR, PRESSURE TUBE
005375 P 1
REACTOR, PRODUCTION
044674 P 14
REACTOR, PULSED
074978 P 28
REACTOR, PWR
014734 P 5 020575 P 6 047843 P 16 061864 P 18
065953 P 23 067891 P 24 068766 P 25 075888 P 29
077195 P 32 087971 P 38 095150 P 39 099318 P 40
099746 P 40
REACTOR, RESEARCH
015305 P 5 041509 P 12 043845 P 13 043846 P 13
076284 P 30
REACTOR, THERMONUCLEAR
036443 P 10 044524 P 14 063263 P 20 063662 P 20
063703 P 20 065603 P 23 066363 P 23 067566 P 24
069928 P 25 074325 P 27 074978 P 28 076136 P 30
076901 P 31 077197 P 32 080416 P 33 080626 P 34
080697 P 34 081061 P 35 081698 P 36 082319 P 36
083710 P 37 085479 P 37 087968 P 38
REACTOR, TRAINING
004683 P 1
REFUELING
030487 P 8
REGULATION
036855 P 10 062229 P 19 064412 P 21 072593 P 27
077129 P 31 080427 P 34
REGULATION, AEC
014463 P 4 015896 P 5 036038 P 9 058861 P 18
061864 P 18 067891 P 24
REGULATION, FEDERAL
067891 P 24
RELEASE RATE
023290 P 6 063703 P 20 075295 P 28 097671 P 39
099746 P 40
RELIABILITY, SYSTEM
069928 P 25
REPORT, OPERATIONS
005375 P 1
REPORT, PSAR
030487 P 8
REPORT, SAR
004683 P 1
RESIN
040046 P 12
RESOURCE, NATURAL
045400 P 15 055112 P 17 063905 P 21 077143 P 31
077196 P 32 078884 P 33 083078 P 37
RESPONSE TIME
013067 P 3
RETENTION
076284 P 30 100125 P 40
RIVER
052407 P 16
RIVER, MISSISSIPPI
081331 P 36
RUTHENIUM
038117 P 11 058861 P 18 082319 P 36
SAFETY ANALYSIS
043845 P 13 043846 P 13
SAFETY EVALUATION
038862 P 12 062170 P 19 063703 P 20 063905 P 21
067566 P 24 068566 P 25 072991 P 27 077193 P 32
077311 P 33 079069 P 33 080626 P 34
SAFETY REVIEW
072136 P 26
SAMPLING
036429 P 10 040046 P 12 065493 P 22 076284 P 30
SAMPLING, HIGH ALTITUDE
025598 P 6
SAN ONOFRE 1 (PWR)
047843 P 16 067891 P 24
SAVANNAH RIVER PLANT
044674 P 14 052407 P 16
SEDIMENT
058861 P 18
SEISMOLOGY
027527 P 6
SHIELDING
077311 P 33
SHUTDOWN MARGIN
043845 P 13 043846 P 13
SIMULATION
066877 P 24 067892 P 24
SITING
077311 P 33
SITING, REACTOR
063263 P 20 083710 P 37
SITING, URBAN
063263 P 20
SKIN
065652 P 23 082319 P 36
SOCIO/PHILOSOPHICAL CONSIDERATION
012417 P 3 043979 P 13 063263 P 20 070395 P 26
082319 P 36
SODIUM
014384 P 4 085331 P 37 091964 P 38
SOIL
051840 P 16 077311 P 33
SOIL, NUCLIDE OCCURRENCE
016916 P 5
SOLID
062398 P 19 065493 P 22 072136 P 26
SOLVENT EXTRACTION PROCESS
036242 P 10
SORPTION
027977 P 7 077311 P 33
SOURCE, RADIATION
062087 P 18 072991 P 27 077109 P 31 079069 P 33
080427 P 34 080626 P 34
SOURCE, RADIATION, LOST
045077 P 15
SOURCE, VOLUME

062087 P 18 079069 P 33
SPECTROMETRY
076284 P 30 077129 P 31
SPECTROMETRY, X-RAY
080825 P 35
SPOKESMAN, AEC
045016 P 14 045018 P 15 049348 P 16
SPOKESMAN, STAFF
044068 P 13
STATEMENT, ENVIRONMENTAL
083078 P 37
STEAM
021802 P 11 080690 P 34
STEAM GENERATOR
069594 P 25 092744 P 38
STEEL, STAINLESS
047843 P 16 080708 P 35 099295 P 39
STIMULATION
031269 P 9 045400 P 15 055112 P 17 077143 P 31
078884 P 33 083078 P 37
STORAGE CONTAINER
067892 P 24
STRATOSPHERE
013282 P 4 025598 P 6 030129 P 7 030682 P 8
054495 P 17
STRESS ANALYSIS
074978 P 28
STRONTIUM
012417 P 3 013282 P 4 025598 P 6 038161 P 11
043979 P 13 052569 P 16 052691 P 17 058861 P 18
078884 P 33 082317 P 36 082319 P 36 096216 P 39
STRUCTURAL INTEGRITY
085479 P 37
SURFACE CONTAMINATION
030129 P 7 061540 P 18 083078 P 37
SURFACE FILM DEPOSIT
062398 P 19
SURFACE WATER
027527 P 6 089425 P 38
SURFACE WATER, NUCLIDE OCCURRENCE
016916 P 5 068115 P 25
SURVEILLANCE PROGRAM
012417 P 3 031269 P 9 067891 P 24
SURVEY
063703 P 20 075431 P 28
SYSTEM ANALYSIS
063703 P 20 075576 P 29
SYSTEM DESCRIPTION
062398 P 19 063703 P 20 066363 P 23
TECHNOLOGY
085331 P 37
TEMPERATURE
064413 P 21
TEMPERATURE COEFFICIENT
041509 P 12
TEST, WEAPONS
072991 P 27 077197 P 32 079069 P 33 082319 P 36
TESTING
036429 P 10 038862 P 12 045079 P 15 062087 P 18
066877 P 24 067892 P 24 076899 P 30 080427 P 34
093650 P 39
THERMAL ANALYSIS
100305 P 40
THERMAL CONSIDERATION
011521 P 3 030129 P 7
THERMAL EFFICIENCY
076136 P 30
THERMAL EXPERIMENT
091964 P 38
THERMAL NEUTRON
061540 P 18
THERMAL POLLUTION
044068 P 13 062380 P 19 075295 P 28 076136 P 30
THERMAL PROPERTY
080690 P 34
THERMODYNAMICS
080690 P 34
THORIUM
010526 P 2 010702 P 2
TOPOGRAPHY
081331 P 36
TOXICITY
065652 P 23
TRACER
027527 P 6
TRACER, RADIOACTIVE
013067 P 3 014384 P 4
TRAINING
005375 P 1
TRANSPIRATION
037402 P 10
TRANSPORT
076899 P 30
TRANSPORT PROPERTY
027527 P 6
TRANSURANIUM ELEMENT
082317 P 36
TROJAN (PWR)
095150 P 39
TROPOSPHERE
030129 P 7 082319 P 36
TUMOR
065652 P 23
UNITED KINGDOM
012417 P 3
UNITED STATES
002706 P 1 075431 P 28
URANIUM
065652 P 23 080416 P 33 082317 P 36 082319 P 36
URANIUM CARBIDE
005375 P 1
URANIUM DIOXIDE
010702 P 2 011152 P 2 080708 P 35
URANIUM OXIDE
010526 P 2
USSR
038161 P 11 061133 P 18
VACUUM RELIEF
033070 P 9
VANADIUM
075647 P 29 081698 P 36 085479 P 37
VAPOR EXCHANGE
037402 P 10 074536 P 28
VEGETATION
064785 P 21
VENTILATION SYSTEM
005375 P 1
VOID COEFFICIENT
041509 P 12
WASTE DISPOSAL
037466 P 11 045077 P 15 053739 P 17 063263 P 20
072136 P 26 072593 P 27 075431 P 28 075576 P 29
081698 P 36 089425 P 38
WASTE DISPOSAL, ATMOSPHERIC
010702 P 2 045400 P 15 065953 P 23
WASTE DISPOSAL, ECONOMICS
072136 P 26
WASTE DISPOSAL, GAS
023290 P 6 030487 P 8 062380 P 19 068766 P 25
069957 P 26
WASTE DISPOSAL, LIQUID
014734 P 5 030487 P 8 058861 P 18 061864 P 18
062380 P 19 068766 P 25 069957 P 26
WASTE DISPOSAL, OCEAN
067891 P 24
WASTE DISPOSAL, RIVER
015305 P 5 065953 P 23
WASTE DISPOSAL, SALT
066435 P 23
WASTE HEAT
063263 P 20
WASTE MANAGEMENT
012417 P 3 030487 P 8 049348 P 16 058861 P 18
061864 P 18 062380 P 19 069928 P 25 069957 P 26
072136 P 26 072593 P 27 075647 P 29 077193 P 32
081698 P 36 089425 P 38
WASTE STORAGE
072136 P 26 072593 P 27
WASTE TREATMENT
044674 P 14 072593 P 27 075295 P 28 081331 P 36
099746 P 40
WASTE TREATMENT, GAS
010526 P 2 023290 P 6
WASTE TREATMENT, LIQUID
072213 P 26
WASTE, INDUSTRIAL
075431 P 28
WATER
021802 P 11 037402 P 10 051840 P 16
WATER POLLUTION
027527 P 6 043979 P 13 044068 P 13 045018 P 15
075576 P 29 077109 P 31
WATER TREATMENT
021802 P 11
WATER VAPOR
037402 P 10 076901 P 31
WATER, DRINKING
064785 P 21 082317 P 36
WATER, IRRIGATION
068115 P 25
WESTINGHOUSE
099746 P 40

WHOLE BODY
079069 P 33
XENON
014384 P 4 030690 P 8 044967 P 14 077129 P 31
099316 P 40
XENON OSCILLATION
093650 P 39
ZION 1 (PWR)
044068 P 13
ZIRCALOY
062398 P 19 080708 P 35 099295 P 39
ZIRCONIUM
080708 P 35 082319 P 36

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

AMAVIS RJ
075576 P 29
ANSPAUGH LR
037402 P 10
ARNOLD WD
038117 P 11 064413 P 21 066877 P 24 067892 P
AUSTIN JH
099295 P 39
BARNABY F
012417 P 3
BARNES RH
014734 P 5
BARRY PJ
075295 P 28
BARTON CJ
045400 P 15 055111 P 17 055112 P 17 062170 P
062229 P 19 068566 P 25
BAUMGARTNER F
036242 P 10
BEGEMANN F
030475 P 8
BERLIN A
075576 P 29
BOEGLY WJ
023290 P 6
BOGGS RF
027648 P 7 033070 P 9
BOHLMANN EG
066435 P 23
BOOTH LA
074978 P 28
BOWMAN CR
045400 P 15 055112 P 17 062170 P 19
BRIGGS GR
062170 P 19
BRIGGS RB
072363 P 27
BROECKER WS
064787 P 22
BUCHANAN PS
027648 P 7 033070 P 9
BULLOCK JB
004683 P 1
BUTLER HM
055111 P 17
CADLE RD
030682 P 8
CAMERON JF
013282 P 4
CARACH J
080626 P 34
CARVER KB
013202 P 4
CECHVALA L
080626 P 34
CHEN EW
055112 P 17
CHRISTENSEN J
009797 P 2
COHEN JJ
070395 P 26
COHEN P
065493 P 22
COMPERE EL
092744 P 38
COOLEY RC
027977 P 7
COWSER KE
016916 P 5 023290 P 6
CREVER, FE
021802 P 11
CROUSE DJ
038117 P 11 064413 P 21 066877 P 24 067892 P
CROWSON DL
077193 P 32
CULKOWSKI WM
062170 P 19
CUMMING RB
055111 P 17
DANIELS E
004683 P 1
DIRIAN D
061133 P 18
DRALEY JE
081061 P 35
DREW HR
076136 P 30
DROBINSKI JC
064785 P 21
DRUMMOND WE
076136 P 30
DUDEY ND
044158 P 13 080825 P 35
EBERSOLE ER
100125 P 40
EISENBUD M
082317 P 36 082319 P 36
ELLEMAN TS
099295 P 39
ERIKSSON E
054495 P 17 076899 P 30
ET. AL
080825 P 35
FOLSOM TR
067891 P 24
FORTESCUE P
062380 P 19
FOSTER RF
077109 P 31
FRAAS AP
044524 P 14 075647 P 29
FREID SH
092744 P 38
FRIEDMAN I
030475 P 8
GIBSON JA
007399 P 1
GILBERT RS
065472 P 22
GOLDIN AS
064785 P 21
GOODE JH
010526 P 2 010702 P 2
GOODJOHN AJ
062380 P 19
GOTCHY RL
031269 P 9
GOULD RW
066363 P 23
GRATHWOHL G
087968 P 38
GREEN JB
038862 P 12 075681 P 29 077196 P 32
GREENBERG S
081061 P 35
GRIMES WR
066435 P 23
GROSSE AV
064787 P 22
HAINES A
030457 P 8
HANDLEY TP
011521 P 3
HANNA SR
068566 P 25
HARWARD ED
036855 P 10 045079 P 15 076900 P 30
HICKMAN RG
074325 P 27 080697 P 34
HICKS JH
062398 P 19
HIGGINS GH
070395 P 26
HOLZER A
063905 P 21
HORNYIK K
075888 P 29 095150 P 39
HORROCKS DL
077194 P 32
HORSKI J
074326 P 28
HORTON JH
052407 P 16
HOWARD JO
030778 P 9
HOZER F
077196 P 32
HUDSPETH EL
027648 P 7 033070 P 9
HULL A

045018 P 15
HULL AP
044967 P 14
HUNZINGER W
072213 P 26
IZRAEL YA
038161 P 11
JACOBS DG
023290 P 6 030129 P 7 045400 P 15 062170 P
062229 P 19
JAMME E
040008 P 12
JANSSEN U
069957 P 26
JARRY RL
099318 P 40
JAUHO P
087971 P 38
JUNKINS RL
044674 P 14
KABELE TJ
091964 P 32
KAYE SV
016916 P 5
KELLY MJ
045400 P 15 055112 P 17 062170 P 19 062229 P
077143 P 31
KELLY MJ ET AL.
078884 P 33
KENNY AW
045077 P 15
KESSER GM
085331 P 37
KINCAID GP JR
076284 P 30
KIRCHMANN R
074536 P 28
KIRSHENBAUM AD
064787 P 22
KLEMENT AW
079069 P 33
KONIG LA
072991 P 27
KORANDA JJ
037402 P 10
KOUTS H
077195 P 32
KRUGER P
068115 P 25
KULLEN BJ
099318 P 40
KULP JL
064787 P 22
KUHAR R
097671 P 39
KUNKEL WP
014384 P 4
KUNZ CR
077129 P 31
LAGATTA DP
064785 P 21
LANGHAM WH
065652 P 23
LARSEN RP
080625 P 35
LEGER D
061133 P 18
LENTSCH JW
095150 P 39
LEONARD JH
047843 P 16
LESSLER RM
038862 P 12 075681 P 29 077196 P 32
LIBBY WF
052569 P 16
LIDSKY LK
036443 P 10
LONG J
077195 P 32
MACHTA L
025598 P 6
MARKO AM
075295 P 28
MARTELL EA
052691 P 17 076901 P 31
MARTIN JE
045079 P 15
MARTIN JR
037402 P 10
MATTILA L
087971 P 38
MATUSZEK JM
077129 P 31
MCNEESE LE
096216 P 39
METZ WD
083710 P 37
MEYER AS
055112 P 17
MILES CC
100125 P 40
MILLER CR
079069 P 33
MILLS RG
063263 P 20 069928 P 25
MINX RP, ET AL.
079069 P 33
MISKEL JA
013067 P 3
MOMYER FF
036429 P 10
MOORE RE
068566 P 25
MORGAN IL
027648 P 7 033070 P 9
MOUNTAIN JE
047843 P 16
MRAVICH NJ
062398 P 19
MURBACH EW
014384 P 4
MUSGRAVE BC
030457 P 8 089425 P 38
NELLIS DO
027648 P 7 033070 P 9
NESTOR CW
092744 P 38
OESTMANN MJ
061864 P 18
OLESEN CB
009797 P 2
OPHEL IL
075295 P 28
PAPERIELLO CJ
077129 P 31
PARKER FL
025055 P 6 053739 P 17
PAYNE BR
013282 P 4
PETERS FE
069594 P 25
PETERSON HT
036855 P 10 045079 P 15 076900 P 30
PETERSON KR
083078 P 37
PIPER AM
051840 P 16
POCOCK FJ
062398 P 19
POLLOCK BD
014384 P 4
POSTMA H
044524 P 14 062703 P 20
POUTHIER J
030690 P 8
RADFORD EP
043979 P 13
RAY JW
014734 P 5 020575 P 6 037466 P 11
RETIEF JV
068115 P 25
ROHWER PS
016916 P 5 055111 P 17 062170 P 19 077143 P 3
078884 P 33
ROSENTHAL MW
096216 P 39
ROSSI J
030690 P 8
ROTH E
061133 P 18
ROTHWELL E
011481 P 3
ROY P
080708 P 35
RUBIN BF
080708 P 35
SANDERS JP
100305 P 40
SIDDONS RA
064412 P 21

SHEETS JGPM
075576 P 29
SMITH CF
036429 P 10
SMITH JM
065472 P 22
SNYDER WS
016916 P 5
STAPLETON GB
077311 P 33
STEINER D
075647 P 29 081698 P 36 085479 P 37
STOEVER D
080977 P 35
STRUXNESS EG
016916 P 5 062170 P 19 078884 P 33
TADMOR J
023290 P 6
TAYLOR GR
069594 P 25
TAYLOR RW
080690 P 34
TERRILL JG
064785 P 21
TEVEROVSKY EN
038161 P 11
THATCHER LL
013282 P 4
THOMAS PH
061540 P 18 077311 P 33
THOMPSON TJ
015305 P 5 049348 P 16
TREVORROW LE
099318 P 40
TSAI CM
040046 P 12
TUCK JL
067566 P 24
TURNOCK RK
095150 P 39
UNRUH CM
062087 P 18 080427 P 34
VAN DEN HOEK J
074536 P 28
VERGHESE K
099295 P 39
VOGEL RC
080825 P 35
WASCHER RE
030778 P 9
WASSELL LL
011481 P 3
WATSON GM
066435 P 23
WEAVER CL
036855 P 10 045079 P 15 076900 P 30
WENG PS
040046 P 12
WEXLER S
100125 P 40
WHIPPLE, HG
002706 P 1
WILSON R
075295 P 28
WOLKENHAUER WC
080416 P 33
WOOD JI
040008 P 12
WOOTON RO
014734 P 5
WORADLO GP
080708 P 35
WRIGHT JH
065953 P 23

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN THE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE. * INDICATES END OF TITLE.)

#THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES	ABSORBED ON TITANIUM*	007399 P 1
#TRITIUM CONTAMINATION IN PARTICLE	ACCELERATOR OPERATION*	033070 P 9
#TRITIUM CONTAMINATION IN PARTICLE	ACCELERATOR OPERATION*	027648 P 7
IN THE NEIGHBORHOOD OF A PROPOSED 300 BEV HIGH ENERGY	ACCELERATOR SITUATED ON A CHALK SITE* GROUND WATER SYSTEM	077311 P 33
CONTAMINATION OF GROUND WATER SYSTEM BY HIGH ENERGY PROTON	ACCELERATORS* #POSSIBLE	061540 P 18
IN THE ATMOSPHERE* #AN	ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS	076899 P 30
REACTORS FINAL REPORT* #	ACCUMULATION AND RELEASE OF TRITIUM IN PRESSURIZED WATER	095150 P 39
#ARMY TESTS TRITIUM-	ACTIVATED EXIT MARKERS ON PLANES (LUMINOSITY AND LEAKAGE)*	010982 P 2
#POTENTIAL	ADVANTAGES OF FUSION POWER REACTORS*	069928 P 25
#POTENTIAL	ADVANTAGES OF FUSION POWER REACTORS*	063263 P 20
#	AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS*	049348 P 16
#	AEC EXEMPTS THE USE OF TRITIUM IN CERTAIN PRODUCTS*	013440 P 4
TRITIUM, KRYPTON-85 AND PROMETHIUM-147* #	AEC EXEMPTS USE OF SELF-LUMINOUS PRODUCTS CONTAINING	036038 P 9
#	AEC EXEMPTS USE OF TRITIUM IN GLOW LAMPS*	015896 P 5
INSTRUMENTS* #	AEC EXEMPTS USE OF TRITIUM IN MARINE NAVIGATIONAL	014463 P 4
REPORT, JANUARY - MARCH 1966* #	AEC UNCLASSIFIED PROGRAMS. QUARTERLY TECHNICAL PROGRESS	011152 P 2
#BIOLOGICAL IMPLICATIONS OF THE NUCLEAR	AGE*	044674 P 14
#ORL EXEMPTS MIT FROM 10CFR20 TO	ALLOW TRITIUM DISCHARGE*	015305 P 5
POWER REACTOR PROJECTS IN CANADA AND THE UNITED STATES OF	AMERICA* #SELECTED	005375 P 1
* #	ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM	064785 P 21
* #TRITIUM	ANALYSIS OF MIXED-OXIDE FUEL RODS IRRADIATED IN A FAST FLUX	080708 P 35
#	ANALYSIS SHOWS RULISON GAS SAFE FOR POTENTIAL CUSTOMER USE*	055988 P 17
#	ANDREW HULL ON KRYPTON, TRITIUM*	045018 P 15
REPORT FOR APRIL 1 - JUNE 30, 1969* #CHEMICAL	APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE) - PROGRESS	038117 P 11
REPORT FOR APRIL 1 TO JUNE 30, 1971* #CHEMICAL	APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE) - PROGRESS	067892 P 24
MANAGEMENT OF WATER RESOURCES.* #POTENTIAL	APPLICATIONS OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND	051840 P 16
#TRITIUM PRODUCTION IN PLOWSHARE	APPLICATIONS*	077196 P 32
#SYMPOSIUM OF RADIOECOLOGY	APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT*	075576 P 29
#PRELIMINARY	APPRAISAL OF THE HAZARDS PROBLEM*	044524 P 14
#SOURCES AND INVENTORY OF RADIOACTIVITY IN THE	AQUATIC ENVIRONMENT*	077109 P 31
#MAGNETIC CONTAINMENT FUSION: WHAT	ARE THE PROSPECTS?*	083710 P 37
- HYPOTHETICAL POPULATION EXPOSURES IN METROPOLITAN	AREAS* SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES	062229 P 19
OF NUCLEAR EXPLOSIVES FOR WATER RESOURCES DEVELOPMENT IN	ARID REGIONS* #THE USE	068115 P 25
PRESENT, AND FORESEEABLE FUTURE* #RADIOACTIVE CONTAMINATION	ARISING FROM THE PEACEFUL USES OF ATOMIC ENERGY - PAST,	045077 P 15
LUMINOSITY AND LEAKAGE)* #	ARMY TESTS TRITIUM-ACTIVATED EXIT MARKERS ON PLANES (	010982 P 2
#CONTROLLING TRITIUM HAZARDS	AROUND HEAVY WATER MODERATED REACTORS*	027977 P 7
1958.* #	ARTIFICIAL RADIOACTIVITY FROM NUCLEAR TESTS UP TO NOVEMBER	052691 P 17
METHANE* #ON THE INVENTORY OF	ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN ATMOSPHERIC	076901 P 31
RELEASE OF TRITIUM IN HIGH-TEMPERATURE GAS-COOLED REACTORS	AS A FUNCTION OF DESIGN, OPERATIONAL, AND MATERIAL	092744 P 38
#THE NUCLEAR PERFORMANCE OF VANADIUM	AS A STRUCTURAL MATERIAL IN FUSION REACTOR BLANKETS*	085479 P 37
#ENGINEERING AND ENVIRONMENTAL	ASPECTS OF FUSION POWER REACTORS*	063703 P 20
#ENVIRONMENTAL	ASPECTS OF HIGH-TEMPERATURE GAS-COOLED REACTORS*	062380 P 19
#NUCLIDES OF CONCERN IN THE ENVIRONMENTAL	ASPECTS OF NUCLEAR POWER OPERATION*	044967 P 14
ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* #SOME	ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE	075295 P 28
105* #TRITIUM HAZARDS	ASSOCIATED WITH NEUTRON GENERATORS. TECHNICAL BULLETIN NO.	013202 P 4
NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE	ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS*AT BROOKHAVEN	064889 P 22
#REPROCESSING PROBLEMS	ASSOCIATED WITH THE INCREASING BURN-UP OF FUTURE FUELS*	036242 P 10
#SOME PROBLEMS	ASSOCIATED WITH TRITIUM IN FUSION REACTORS*	074325 P 27
#SOME PROBLEMS	ASSOCIATED WITH TRITIUM IN FUSION REACTORS*	080697 P 34
ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN	ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR	016916 P 5
#THE RELEASE OF TRITIUM AND KRYPTON-85 TO THE	ATMOSPHERE DURING PROCESSING OF THO2 - UO2 REACTOR FUEL*	010526 P 2
OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE	ATMOSPHERE* #AN ACCOUNT	076899 P 30
#NATURAL TRITIUM CONTENT OF	ATMOSPHERIC HYDROGEN (T1782)*	064787 P 22
#TRITIUM CONTENT OF	ATMOSPHERIC METHANE AND ETHANE*	030457 P 8
#TRITIUM AND DEUTERIUM IN	ATMOSPHERIC METHANE*	030475 P 8
THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN	ATMOSPHERIC METHANE* #ON	076901 P 31
#ROLE OF METHYLENE IN THE PRODUCTION OF	ATMOSPHERIC TRITIATED METHANE*	030682 P 8
#REVIEW OF LOW-MASS	ATOM PRODUCTION IN FAST REACTORS*	044158 P 13
RADIOACTIVE CONTAMINATION ARISING FROM THE PEACEFUL USES OF	ATOMIC ENERGY - PAST, PRESENT, AND FORESEEABLE FUTURE* #	045077 P 15
#PROSPECTS OF WIDE PEACEFUL USE OF	ATOMIC ENERGY WITH RADIATION SAFETY OF POPULATION*	038161 P 11
RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN	BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL	064889 P 22
OF NUCLEAR FACILITIES IN THE UPPER MISSISSIPPI RIVER	BASIN IN THE YEAR 2000*POTENTIAL RADIOLOGICAL IMPLICATIONS	081331 P 36
II - HYPOTHETICAL POPULATION EXPOSURES OUTSIDE SAN JUAN	BASIN* OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. PHASE	045400 P 15
HYPOTHETICAL RELEASES OF CONTAMINATED GAS IN THE SAN JUAN	BASIN* PROJECT GASBUGGY. FINAL REPORT, PHASE 1 - IMPACT OF	062170 P 19
EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY	BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL	043979 P 13
PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM	BEHAVIOR IN A NATURAL GAS PROCESSING PLANT* OF CONSUMER	055112 P 17
SINTERED BEO COMPACTS* #DETERMINATION OF THE RELEASE	BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED	080977 P 35
#SOURCES OF TRITIUM AND ITS	BEHAVIOR UPON RELEASE TO THE ENVIRONMENT*	030129 P 7
OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED	BEO COMPACTS* #DETERMINATION OF THE RELEASE BEHAVIOR	080977 P 35
OBSERVATIONS OF THE RELEASE OF TRITIUM FROM IRRADIATED	BERYLLIA* #PRELIMINARY	011481 P 3
#NEED FOR	BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS*	067891 P 24
GROUND WATER SYSTEM IN THE NEIGHBORHOOD OF A PROPOSED 300	BEV HIGH ENERGY ACCELERATOR SITUATED ON A CHALK SITE* THE	077311 P 33
INVOLVING NUCLEAR WARHEADS* #	BIOLOGICAL CONSIDERATIONS OF NONNUCLEAR INCIDENTS	065652 P 23
#	BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE*	044674 P 14

#TRITIUM IN THE
#DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO
OF VANADIUM AS A STRUCTURAL MATERIAL IN FUSION REACTOR
#THE
#PREDICTING PERFORMANCE OF D2O STEAM TURBINES IN
#TRITIUM EXPERIENCE IN
#TRITIUM RETENTION IN EBR-II-IRRADIATED
#RADIOACTIVE CONTAMINATION OF OIL PRODUCED FROM NUCLEAR-
AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT
HEAVY WATER SYSTEM RESEARCH AND MEASUREMENT REACTOR IN THE
ON THE SAFETY OF THE RESEARCH AND MEASUREMENT REACTOR,
HAZARDS ASSOCIATED WITH NEUTRON GENERATORS. TECHNICAL
AND REPROCESSING PLANTS AND THE EXPECTED RADIOLOGICAL
#ENVIRONMENTAL
#REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING
JANUARY-JUNE 1972* #CHEMICAL ENGINEERING DIVISION
#TRITIUM IN

BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 28
BLANCO AND WAGON WHEEL* 083078 P 37
BLANKETS* #THE NUCLEAR PERFORMANCE 085479 P 37
BLASCON* 063662 P 20
BOILING HEAVY-WATER REACTORS* 009797 P 2
BOILING WATER REACTORS* 065472 P 22
BORON CARBIDE* 100125 P 40
BROKEN SHALE* 064413 P 21
BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH 064889 P 22
BRUNSWICK AND ON THE OPERATION OF THE REACTOR WITH TWO 043846 P 13
BRUNSWICK* #EXPERT OPINION 043845 P 13
BULLETIN NO. 105* #TRITIUM 013202 P 4
BURDEN TILL THE YEAR 2000* TRITIUM BY NUCLEAR POWER PLANTS 087968 P 38
BURDENING BY TRITIUM* 072991 P 27
BURN-UP OF FUTURE FUELS* 036242 P 10
BURNUP, CROSS SECTION, AND DOSIMETRY SEMIANNUAL REPORT, 080825 P 35
BWR, PRESSURE VESSEL DESIGN CRITERIA, AND REVISED PAGES* 030487 P 8

#DIFFUSION AND DOSE
#SELECTED POWER REACTOR PROJECTS IN
AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN
PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC
#CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (
#CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (
#TRITIUM RETENTION IN EBR-II-IRRADIATED BORON
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR
AND RADIOCHEMICAL COMPOSITION OF NATURAL GAS FROM THE
DURING PROCESSING OF THO2-UO2 FUELS* #HOT-
#
#AEC EXEMPTS THE USE OF TRITIUM IN
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD
OF A PROPOSED 300 BEV HIGH ENERGY ACCELERATOR SITUATED ON A
#JUSTIFICATION SUPPORTING TFCH SPEC
NATIONAL #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED
#
IN THE HALDEN REACTOR DURING OPERATION ON ITS SECOND FUEL
THE CAVITY PRODUCED BY THE PROJECT GASBUGGY #STUDIES OF
PROGRESS REPORT FOR APRIL 1 - JUNE 30, 1969* #
PROGRESS REPORT FOR APRIL 1 TO JUNE 30, 1971* #
DOSIMETRY SEMIANNUAL REPORT, JANUARY-JUNE 1972* #
CONTROL* #NUCLEAR SAFETY,
ENDING MAY 31, 1971* #REACTOR
#NUCLEAR STEAM SUPPLY WATER
#AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE
#NEED FOR BETTER INFORMATION ON EFFECTS OF
#AEC
OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO
RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME
PROJECT GASBUGGY #STUDIES OF CHEMICAL AND RADIOCHEMICAL
#A PRELIMINARY STUDY OF TRITIUM
OPERATION* #NUCLIDES OF
#FISSION-FUSION SYMBIOSIS - GENERAL
#RADIATION
WARHEADS* #BIOLOGICAL
WITH NUCLEAR #COSE-ESTIMATION STUDIES RELATED TO PROPOSED
PHASE 1 - IMPACT OF HYPOTHETICAL #THEORETICAL EVALUATION OF
HYPOTHETICAL POPULATION #THEORETICAL EVALUATION OF
TRITIUM BEHAVIOR IN A NATURAL #THEORETICAL EVALUATION OF
#AEC EXEMPTS USE OF SELF-LUMINOUS PRODUCTS
#MAGNETIC
FINAL REPORT, PHASE 1 - IMPACT OF HYPOTHETICAL RELEASES OF
ENERGY - PAST, PRESENT, AND FORESEEABLE FUTURE*#RADIOACTIVE
#NUCLEAR SAFETY, CHEMICAL REACTIONS. FISSION PRODUCT AND
ENERGY SOURCES* #ENVIRONMENTAL TRITIUM
#TRITIUM
#TRITIUM
NUCLEAR EXPLOSIONS* #RADIOACTIVE
ACCELERATORS* #POSSIBLE
#RADIOACTIVE
#A STUDY OF WATER PLANT ISOLATION FROM
GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* #
#NATURAL TRITIUM
#TRITIUM
DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR
CHEMICAL REACTIONS. FISSION PRODUCT AND CONTAMINATION
#OUTLOOK FOR
#THE PACIFIC NORTHWEST LABORATORY ANNUAL REPORT ON
#PROGRESS IN
REACTORS* #
#DETECTION OF RADIOACTIVE GASES IN THE CO2
STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR
#TRITIUM GENERATION IN THE
DISTRIBUTION AND RELEASE OF TRITIUM IN HIGH-TEMPERATURE GAS-
#ENVIRONMENTAL ASPECTS OF HIGH-TEMPERATURE GAS-
EXPLOSIONS* #RADIOACTIVE CONTAMINATION OF

CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL* 083078 P 37
CANADA AND THE UNITED STATES OF AMERICA* 005375 P 1
CANADA* #SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY 075295 P 28
CANAL WITH NUCLEAR EXPLOSIVES. PHASE I* STUDIES RELATED TO 016916 P 5
CANE) - PROGRESS REPORT FOR APRIL 1 - JUNE 30, 1969* 038117 P 11
CANE) - PROGRESS REPORT FOR APRIL 1 TO JUNE 30, 1971* 067892 P 24
CARBIDE* 100125 P 40
CARBON-14 AND TRITIUM* 064785 P 21
CAVITY PRODUCED BY THE PROJECT GASBUGGY NUCLEAR SHOT* 036429 P 10
CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 010702 P 2
CENTRAL STATION POWER GENERATION BY LASER DRIVEN FUSION* 074978 P 28
CERTAIN PRODUCTS* 013440 P 4
CHAIN* 074536 P 28
CHALK SITE* OF THE GROUND WATER SYSTEM IN THE NEIGHBORHOOD 077311 P 33
CHANGES AT THE NBS RESEARCH REACTOR* 041509 P 12
CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN 064889 P 22
CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES* 077129 P 31
CHARGE* #EXPERIENCE WITH HEAVY WATER MANAGEMENT 040008 P 12
CHEMICAL AND RADIOCHEMICAL COMPOSITION OF NATURAL GAS FROM 036429 P 10
CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE) - 038117 P 11
CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE) - 067892 P 24
CHEMICAL ENGINEERING DIVISION BURNUP, CROSS SECTION, AND 080825 P 35
CHEMICAL REACTIONS. FISSION PRODUCT AND CONTAMINATION 014384 P 4
CHEMISTRY DIVISION ANNUAL PROGRESS REPORT FOR PERIOD 066435 P 23
CHEMISTRY RESEARCH* 062398 P 20
CLAIMS* 049348 P 16
COASTAL REACTORS* 067891 P 24
COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS* 049348 P 16
COMPACTS* #DETERMINATION OF THE RELEASE BEHAVIOR 080977 P 35
COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER 064889 P 22
COMPOSITION OF NATURAL GAS FROM THE CAVITY PRODUCED BY THE 036429 P 10
CONCENTRATION IN TSING HUA REACTOR COOLANT* 040046 P 12
CONCERN IN THE ENVIRONMENTAL ASPECTS OF NUCLEAR POWER 044967 P 14
CONSIDERATIONS AND A SPECIFIC EXAMPLE* 036443 P 10
CONSIDERATIONS IN NUCLEAR POWER PLANTS* 030778 P 9
CONSIDERATIONS OF NONNUCLEAR INCIDENTS INVOLVING NUCLEAR 065652 P 23
CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL 016916 P 5
CONSUMER PRODUCTS FROM PROJECT GASBUGGY. FINAL REPORT. 062170 P 19
CONSUMER PRODUCTS FROM PROJECT GASBUGGY. PHASE II - 045400 P 15
CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. 055112 P 17
CONTAINING TRITIUM, KRYPTON-85 AND PROMETHIUM-147* 036038 P 9
CONTAINMENT FUSION: WHAT ARE THE PROSPECTS?* 083710 P 37
CONTAMINATED GAS IN THE SAN JUAN BASIN* PROJECT GASBUGGY. 062170 P 19
CONTAMINATION ARISING FROM THE PEACEFUL USES OF ATOMIC 045077 P 15
CONTAMINATION CONTROL* 014384 P 4
CONTAMINATION FROM INCREASING UTILIZATION OF NUCLEAR 045079 P 15
CONTAMINATION IN PARTICLE ACCELERATOR OPERATION* 033070 P 9
CONTAMINATION IN PARTICLE ACCELERATOR OPERATION* 027648 P 7
CONTAMINATION OF COPPER RECOVERED FROM ORES FRACTURED WITH 066877 P 24
CONTAMINATION OF GROUND WATER SYSTEM BY HIGH ENERGY PROTON 061540 P 18
CONTAMINATION OF OIL PRODUCED FROM NUCLEAR-BROKEN SHALE* 064413 P 21
CONTAMINATION* 021802 P 11
CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE 076284 P 30
CONTENT OF ATMOSPHERIC HYDROGEN (T17821* 064787 P 22
CONTENT OF ATMOSPHERIC METHANE AND ETHANE* 030457 P 8
CONTROL STRATEGIES* #TRITIUM 089425 P 38
CONTROL* #NUCLEAR SAFETY, 014384 P 4
CONTROLLED FUSION POWER* 067566 P 24
CONTROLLED THERMONUCLEAR REACTOR TECHNOLOGY - 1972* 080416 P 33
CONTROLLED THERMONUCLEAR RESEARCH* 066363 P 23
CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED 027977 P 7
COOLANT OF THE G2-G3 REACTORS* 030690 P 8
COOLANT* #A PRELIMINARY 040046 P 12
COOLANT-MODERATOR OF PRESSURIZED WATER REACTORS* 075888 P 29
COOLED REACTORS AS A FUNCTION OF DESIGN, OPERATIONAL, AND 092744 P 38
COOLED REACTORS* 062380 P 19
COPPER RECOVERED FROM ORES FRACTURED WITH NUCLEAR 066877 P 24

PERIOD ENDING AUGUST 30, 1974* #HTGR FUELS AND CORE DEVELOPMENT PROGRAM QUARTERLY PROGRESS REPORT FOR THE 093650 P 39
THE BRUNSWICK AND ON THE OPERATION OF THE REACTOR WITH TWO CORES* WATER SYSTEM RESEARCH AND MEASUREMENT REACTOR IN 043846 P 13
#DETECTION OF RADIOACTIVE GASES IN THE CO2 COOLANT OF THE G2-G3 REACTORS* 030690 P 8
#TRITIUM IN BWR, PRESSURE VESSEL DESIGN CRITERIA, AND REVISED PAGES* 030487 P 8
#AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS* 049348 P 16
JUNE 1972* #CHEMICAL ENGINEERING DIVISION BURNUP, CROSS SECTION, AND DOSIMETRY SEMIANNUAL REPORT, JANUARY- 080825 P 35
#ANALYSIS SHOWS RULISON GAS SAFE FOR POTENTIAL CUSTOMER USE* 055988 P 17
#TRITIUM AND NOBEL-GAS FISSION PRODUCTS IN THE NUCLEAR FUEL CYCLE* 099318 P 40

#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 40
THE FORD NUCLEAR REACTOR* #PRELIMINARY DESIGN AND HAZARDS EVALUATION OF A D2O REFLECTOR TANK FOR 004683 P 1
#TRITIUM IN BWR, PRESSURE VESSEL DESIGN CRITERIA, AND REVISED PAGES* 030487 P 8
IN HIGH-TEMPERATURE GAS-COOLED REACTORS AS A FUNCTION OF DESIGN, OPERATIONAL, AND MATERIAL PARAMETERS* OF TRITIUM 092744 P 38
G2-G3 REACTORS* # DETECTION OF RADIOACTIVE GASES IN THE CO2 COOLANT OF THE 030690 P 8
TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO COMPACTS* # DETERMINATION OF THE RELEASE BEHAVIOR OF HELIUM AND 080977 P 35
#SAFETY INVOLVING DETONATION OF NUCLEAR DEVICES* 027527 P 6
#TRITIUM AND DEUTERIUM IN ATMOSPHERIC METHANE* 030475 P 8
#SAFETY INVOLVING DETONATION OF NUCLEAR DEVICES* 027527 P 6
AND WAGON WHEEL* # DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO 083078 P 37
#SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-STAINLESS STEEL AND ZIRCALOY-2* 099295 P 40
#DRL EXEMPTS MIT FROM 10CFR20 TO ALLOW TRITIUM DISCHARGE* 015305 P 5
#ESTIMATION OF TRITIUM DISCHARGES INTO LLW-STREAMS* 072213 P 26
#MCBRIDE DISCUSSES FUEL REPROCESSING* 045016 P 14
GAS-COOLED REACTORS AS A FUNCTION OF DESIGN, OPERATIONAL, # DISTRIBUTION AND RELEASE OF TRITIUM IN HIGH-TEMPERATURE 092744 P 38
#PARAMETRIC STUDY OF THE TRITIUM DISTRIBUTION IN THE FFTF* 091964 P 38
FOR CONTROL STRATEGIES* #TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS 089425 P 38
REACTOR PLANT* # DISTRIBUTION OF TRITIUM IN A PRESSURIZED WATER POWER 087971 P 38
#TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 4
AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES 076286 P 30
1971* #REACTOR CHEMISTRY DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING MAY 31, 066435 P 23
REPORT, JANUARY-JUNE 1972* #CHEMICAL ENGINEERING DIVISION BURNUP, CROSS SECTION, AND DOSIMETRY SEMIANNUAL 080825 P 35
DECEMBER 31, 1970* #THERMONUCLEAR DIVISION, ANNUAL PROGRESS REPORT FOR PERIOD ENDING 065603 P 23
#DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL* 083078 P 37
OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR # DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION 016916 P 5
#CHEMICAL ENGINEERING DIVISION BURNUP, CROSS SECTION, AND DOSIMETRY SEMIANNUAL REPORT, JANUARY-JUNE 1972* 080825 P 35
#CENTRAL STATION POWER GENERATION BY LASER DRIVEN FUSION* 074978 P 28
DRL EXEMPTS MIT FROM 10CFR20 TO ALLOW TRITIUM DISCHARGE* 015305 P 5
WITH HEAVY WATER MANAGEMENT IN THE HALDEN REACTOR DURING OPERATION ON ITS SECOND FUEL CHARGE* #EXPERIENCE 040008 P 12
#THE RELEASE OF TRITIUM AND KRYPTON-85 TO THE ATMOSPHERE DURING PROCESSING OF THO2 - UO2 REACTOR FUEL* 010526 P 2
CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS* #HOT- 010702 P 2
OPERATION OF NUCLEAR POWER REACTORS* #YIELDS OF TRITIUM DURING THE FISSIONING OF NUCLIDES OF INTEREST IN THE 077194 P 32
#RADIOACTIVITY AND ITS FRACTIONATION DURING UNDERGROUND SHOTS IN A GRANITE MEDIUM* 065493 P 22
#INVENTORIES OF SELECTED LONG-LIVED RADIOISOTOPES PRODUCED DURING WEAPON TESTING* 025598 P 6
RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970* #REPORT ON 068766 P 25
#PRELIMINARY DESIGN AND HAZARDS EVALUATION OF A D2O REFLECTOR TANK FOR THE FORD NUCLEAR REACTOR* 004683 P 1
#PREDICTING PERFORMANCE OF D2O STEAM TURBINES IN BOILING HEAVY-WATER REACTORS* 009797 P 2

#TRITIUM RETENTION IN EBR-II-IRRADIATED BORON CARBIDE* 100125 P 40
OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS 043979 P 13
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE* 076899 P 30
#NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 24
JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE 043979 P 13
#THERMAL EFFECTS OF UNDERGROUND NUCLEAR EXPLOSION* 080690 P 34
AND ZIRCALOY-2* #SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-STAINLESS STEEL 099295 P 40
#FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS* 082319 P 36
RADIATION LEVELS AT BROOKHAVEN #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND 064889 P 22
#REPORT ON RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970* 068766 P 25
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 18
EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY 043979 P 13
#NUCLEAR POWER PLANT EMISSIONS* 069957 P 26
PROGRAM QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING AUGUST 30, 1974* #HTGR FUELS AND CORE DEVELOPMENT 093650 P 39
#THERMONUCLEAR DIVISION, ANNUAL PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1970* 065603 P 23
#HTGR SAFETY STUDIES PROGRESS REPORT FOR THE PERIOD ENDING DECEMBER 31, 1973* 100305 P 40
CHEMISTRY DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING MAY 31, 1971* #REACTOR 066435 P 23
CONTAMINATION ARISING FROM THE PEACEFUL USES OF ATOMIC ENERGY - PAST, PRESENT, AND FORESEEABLE FUTURE*RADIOACTIVE 045077 P 15
WATER SYSTEM IN THE NEIGHBORHOOD OF A PROPOSED 200 BEV HIGH ENERGY ACCELERATOR SITUATED ON A CHALK SITE* OF THE GROUND 077311 P 33
#POSSIBLE CONTAMINATION OF GROUND WATER SYSTEM BY HIGH ENERGY PROTON ACCELERATORS* 061540 P 18
CONTAMINATION FROM INCREASING UTILIZATION OF NUCLEAR ENERGY SOURCES* #ENVIRONMENTAL TRITIUM 045079 P 15
#PROSPECTS OF WIDE PEACEFUL USE OF ATOMIC ENERGY WITH RADIATION SAFETY OF POPULATION* 038161 P 11
#TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWER PLANTS* 036855 P 10
#TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWERPLANTS* 076900 P 30
ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* #SOME 075295 P 28
#SOURCES AND INVENTORY OF RADIOACTIVITY IN THE AQUATIC ENVIRONMENT* 077109 P 31
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 7
#THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 10
#PLOWSHARE AND THE ENVIRONMENT* 063905 P 21
#TRITIUM SOURCES AND RELEASES TO THE ENVIRONMENT* 061864 P 18
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 070395 P 26
OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT* #SYMPOSIUM 075576 P 29
OF THE IMPACT OF A FUSION REACTOR POWER PLANT ON THE ENVIRONMENT* #SOME FEATURES 081061 P 35
#ENGINEERING AND ENVIRONMENTAL ASPECTS OF FUSION POWER REACTORS* 063703 P 20
REACTORS* # ENVIRONMENTAL ASPECTS OF HIGH-TEMPERATURE GAS-COOLED 062380 P 19

#NUCLIDES OF CONCERN IN THE ENVIRONMENTAL ASPECTS OF NUCLEAR POWER OPERATION* 044967 P 14
ENVIRONMENTAL BURDENING BY TRITIUM* 072991 P 27
TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* # ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- 043979 P 13
EXPANDING NUCLEAR FUEL REPROCESSING INDUSTRY*#EVALUATION OF ENVIRONMENTAL HAZARDS FROM RELEASE OF KR-85 AND H-3 IN AN 023290 P 6
#PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION (THE GIVENS)* 080427 P 34
ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS* 065953 P 23
#PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION* 062087 P 18
ENVIRONMENTAL RADIATION* 079069 P 33
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 064785 P 21
UTILIZATION OF NUCLEAR ENERGY SOURCES* # ENVIRONMENTAL TRITIUM CONTAMINATION FROM INCREASING 045079 P 15
WATER SYSTEM IN THE NEIGHBORHOOD OF A PROPOSED 300 BFV # ESTIMATION OF THE INDUCED RADIOACTIVITY OF THE GROUND 077311 P 33
ESTIMATION OF TRITIUM DISCHARGES INTO LLW-STREAMS* 072213 P 26
ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR #DOSE- ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN 016916 P 5
#TRITIUM CONTENT OF ATMOSPHERIC METHANE AND ETHANE* 030457 P 8
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072136 P 26
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072593 P 27
REACTOR* #PRELIMINARY DESIGN AND HAZARDS EVALUATION OF A D2O REFLECTOR TANK FOR THE FORD NUCLEAR 004683 P 1
FINAL REPORT, PHASE 1 - IMPACT OF HYPOTHETICAL #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. 062170 P 19
PHASE II - HYPOTHETICAL POPULATION EXPOSURES #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. 045400 P 15
FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, 055112 P 17
AND H-3 IN AN EXPANDING NUCLEAR FUEL REPROCESSING INDUSTRY*# EVALUATION OF ENVIRONMENTAL HAZARDS FROM RELEASE OF KR-85 023290 P 6
PROCESSING OF THO2-UO2 FUELS* #HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING 010702 P 2
FUSION SYMBIOSIS - GENERAL CONSIDERATIONS AND A SPECIFIC EXAMPLE* #FISSION- 036443 P 10
#DRL EXEMPTS MIT FROM 10CFR20 TO ALLOW TRITIUM DISCHARGE* 015305 P 5
#AEC EXEMPTS THE USE OF TRITIUM IN CERTAIN PRODUCTS* 013440 P 4
KRYPTON-85 AND PROMETHIUM-147* #AEC EXEMPTS USE OF SELF-LUMINOUS PRODUCTS CONTAINING TRITIUM, 036038 P 9
#AEC EXEMPTS USE OF TRITIUM IN GLOW LAMPS* 015896 P 5
#AEC EXEMPTS USE OF TRITIUM IN MARINE NAVIGATIONAL INSTRUMENTS* 014463 P 4
#ARMY TESTS TRITIUM-ACTIVATED EXIT MARKERS ON PLANES (LUMINOSITY AND LEAKAGE)* 010982 P 2
ENVIRONMENTAL HAZARDS FROM RELEASE OF KR-85 AND H-3 IN AN EXPANDING NUCLEAR FUEL REPROCESSING INDUSTRY*EVALUATION OF 023290 P 6
BY NUCLEAR POWER PLANTS AND REPROCESSING PLANTS AND THE EXPECTED RADIOLOGICAL BURDEN TILL THE YEAR 2000*OF TRITIUM 087968 P 38
#TRITIUM EXPERIENCE IN BOILING WATER REACTORS* 065472 P 22
REACTOR DURING OPERATION ON ITS SECOND FUEL CHARGE* # EXPERIENCE WITH HEAVY WATER MANAGEMENT IN THE HALDEN 040008 P 12
MEASUREMENT REACTOR, BRUNSWICK* # EXPERT OPINION ON THE SAFETY OF THE RESEARCH AND 043845 P 13
#THERMAL EFFECTS OF UNDERGROUND NUCLEAR EXPLOSION* 080690 P 34
1969* #CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE) - PROGRESS REPORT FOR APRIL 1 - JUNE 30, 038117 P 11
30, 1971* #CHEMICAL APPLICATIONS OF NUCLEAR EXPLOSIONS (CANE) - PROGRESS REPORT FOR APRIL 1 TO JUNE 067892 P 24
#STUDIES OF RADIOACTIVITY FROM NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES* 064412 P 21
#FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS* 082319 P 36
OF COPPER RECOVERED FROM ORES FRACTURED WITH NUCLEAR EXPLOSIONS* #RADIOACTIVE CONTAMINATION 066877 P 24
UNITED STATES* #NUCLEAR EXPLOSIONS, RADIOACTIVE ISOTOPES, RADIONUCLIDE LEVELS, 002706 P 1
REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL EXPOSURES TO RULISON GAS* 068566 P 25
REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL POPULATION EXPOSURES IN 062229 P 19
#THE USE OF NUCLEAR EXPLOSIVES FOR WATER RESOURCES DEVELOPMENT IN ARID REGIONS* 068115 P 25
RESOURCES.* #POTENTIAL APPLICATIONS OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER 051840 P 16
OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I* RELATED TO PROPOSED CONSTRUCTION 016916 P 5
#REDUCTION OF TRITIUM FROM UNDERGROUND NUCLEAR EXPLOSIVES* 038862 P 12
#REDUCTION OF TRITIUM FROM UNDERGROUND NUCLEAR EXPLOSIVES* 075681 P 29
USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL POPULATION EXPOSURES IN METROPOLITAN AREAS* SAFETY OF PEACEFUL 062229 P 19
FROM PROJECT GASBUGGY. PHASE II - HYPOTHETICAL POPULATION EXPOSURES OUTSIDE SAN JUAN BASIN* OF CONSUMER PRODUCTS 045400 P 15
OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL EXPOSURES TO RULISON GAS* REPORT ON RADIOLOGICAL SAFETY 068566 P 25
#TRITIUM EXTRACTION FROM HEAVY WATER IN NUCLEAR REACTORS* 061133 P 18

YEAR #THE POTENTIAL RADIOLOGICAL IMPLICATIONS OF NUCLEAR FACILITIES IN THE UPPER MISSISSIPPI RIVER BASIN IN THE 081331 P 36
#CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES* 077129 P 31
FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS* 082319 P 36
#RADIOACTIVE FALLOUT.* 052569 P 16
#TRITIUM ANALYSIS OF MIXED-OXIDE FUEL RODS IRRADIATED IN A FAST FLUX* 080708 P 35
#REVIEW OF LOW-MASS ATOM PRODUCTION IN FAST REACTORS* 044158 P 13
THE ENVIRONMENT* #SOME FEATURES OF THE IMPACT OF A FUSION REACTOR POWER PLANT ON 081061 P 35
#PARAMETRIC STUDY OF THE TRITIUM DISTRIBUTION IN THE FFTF* 091964 P 38
TESTS* #PROJECT RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE) PRODUCTION 031269 P 9
EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING 055112 P 17
#SODIUM TECHNOLOGY FINAL REPORT* 085331 P 37
AND RELEASE OF TRITIUM IN PRESSURIZED WATER REACTORS FINAL REPORT* #ACCUMULATION 095150 P 39
EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. FINAL REPORT, PHASE 1 - IMPACT OF HYPOTHETICAL RELEASES OF 062170 P 19
#NUCLEAR SAFETY, CHEMICAL REACTIONS. FISSION PRODUCT AND CONTAMINATION CONTROL* 014384 P 4
FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.* 052407 P 16
#TRITIUM AND NOBEL-GAS FISSION PRODUCTS IN THE NUCLEAR FUEL CYCLE* 099318 P 40
#RADIOACTIVE WASTES FROM FISSION REACTORS* 025055 P 6
SPECIFIC EXAMPLE* # FISSION-FUSION SYMBIOSIS - GENERAL CONSIDERATIONS AND A 036443 P 10
NUCLEAR POWER REACTORS* #YIELDS OF TRITIUM DURING THE FISSIONING OF NUCLIDES OF INTEREST IN THE OPERATION OF 077194 P 32
ANALYSIS OF MIXED-OXIDE FUEL RODS IRRADIATED IN A FAST FLUX* #TRITIUM 080708 P 35
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 28
AND HAZARDS EVALUATION OF A D2O REFLECTOR TANK FOR THE FORD NUCLEAR REACTOR* #PRELIMINARY DESIGN 004683 P 1
THE PEACEFUL USES OF ATOMIC ENERGY - PAST, PRESENT, AND FORESEEABLE FUTURE*#RADIOACTIVE CONTAMINATION ARISING FROM 045077 P 15
#RELATIVE RISKS FROM RADIONUCLIDES FOUND IN NUCLEARLY STIMULATED NATURAL GAS* 078884 P 33
#RADIOACTIVITY AND ITS FRACTIONATION DURING UNDERGROUND SHOTS IN A GRANITE MEDIUM* 065493 P 22
#RADIOACTIVE CONTAMINATION OF COPPER RECOVERED FROM ORES FRACTURED WITH NUCLEAR EXPLOSIONS* 066877 P 24
IN THE HALDEN REACTOR DURING OPERATION ON ITS SECOND FUEL CHARGE* #EXPERIENCE WITH HEAVY WATER MANAGEMENT 040008 P 12
#TRITIUM AND NOBEL-GAS FISSION PRODUCTS IN THE NUCLEAR FUEL CYCLE* 099318 P 40
FROM RELEASE OF KR-85 AND H-3 IN AN EXPANDING NUCLEAR FUEL REPROCESSING INDUSTRY* OF ENVIRONMENTAL HAZARDS 023290 P 6
#MCBRIDE DISCUSSES FUEL REPROCESSING* 045016 P 14
FUEL REPROCESSING* 082317 P 36
#TRITIUM ANALYSIS OF MIXED-OXIDE FUEL RODS IRRADIATED IN A FAST FLUX* 080708 P 35

TO THE ATMOSPHERE DURING PROCESSING OF THO2 - UO2 REACTOR	FUEL* #THE RELEASE OF TRITIUM AND KRYPTON-85	010526 P 2
REPORT FOR THE PERIOD ENDING AUGUST 30, 1974* #HTGR	FUELS AND CORE DEVELOPMENT PROGRAM QUARTERLY PROGRESS	093650 P 39
PROBLEMS ASSOCIATED WITH THE INCREASING BURN-UP OF FUTURE	FUELS* #REPROCESSING	036242 P 10
OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2	FUELS* #HOT-CELL EVALUATION OF THE RELEASE	010702 P 2
OF TRITIUM IN HIGH-TEMPERATURE GAS-COOLED REACTORS AS A	FUNCTION OF DESIGN, OPERATIONAL, AND MATERIAL PARAMETERS*	092744 P 38
#POWER FROM NUCLEAR	FUSION -- PROBLEMS AND PROMISES*	076136 P 30
#ENGINEERING AND ENVIRONMENTAL ASPECTS OF	FUSION POWER REACTORS*	063703 P 20
#POTENTIAL ADVANTAGES OF	FUSION POWER REACTORS*	069928 P 25
#POTENTIAL ADVANTAGES OF	FUSION POWER REACTORS*	063263 P 20
#OUTLOOK FOR CONTROLLED	FUSION POWER*	067566 P 24
OBSERVATIONS ON THE RADIOLOGICAL IMPLICATIONS OF	FUSION POWER* #PRELIMINARY	075647 P 29
NUCLEAR PERFORMANCE OF VANADIUM AS A STRUCTURAL MATERIAL IN	FUSION REACTOR BLANKETS* #THE	085479 P 37
#SOME FEATURES OF THE IMPACT OF A	FUSION REACTOR POWER PLANT ON THE ENVIRONMENT*	081061 P 35
#RADIOACTIVE WASTES FROM	FUSION REACTORS.*	053739 P 17
#SOME PROBLEMS ASSOCIATED WITH TRITIUM IN	FUSION REACTORS*	074325 P 27
#SOME PROBLEMS ASSOCIATED WITH TRITIUM IN	FUSION REACTORS*	080697 P 34
EXAMPLE* #FISSION-	FUSION SYMBIOSIS - GENERAL CONSIDERATIONS AND A SPECIFIC	036443 P 10
#CENTRAL STATION POWER GENERATION BY LASER DRIVEN	FUSION*	074978 P 28
#THE RADIOLOGICAL IMPACT OF	FUSION*	081698 P 36
#MAGNETIC CONTAINMENT	FUSION: WHAT ARE THE PROSPECTS?*	083710 P 37
PROBLEMS ASSOCIATED WITH THE INCREASING BURN-UP OF	FUTURE FUELS* #REPROCESSING	036242 P 10
#HSBR: A REVIEW OF ITS STATUS AND	FUTURE*	096216 P 39
USES OF ATOMIC ENERGY - PAST, PRESENT, AND FORESEEABLE	FUTURE*RADIOACTIVE CONTAMINATION ARISING FROM THE PEACEFUL	045077 P 15
#TRITIUM AND NOBEL-	GAS FISSION PRODUCTS IN THE NUCLEAR FUEL CYCLE*	099318 P 40
OF CHEMICAL AND RADIOCHEMICAL COMPOSITION OF NATURAL	GAS FROM THE CAVITY PRODUCED BY THE PROJECT GASBUGGY	036429 P 10
PHASE 1 - IMPACT OF HYPOTHETICAL RELEASES OF CONTAMINATED	GAS IN THE SAN JUAN BASIN* PROJECT GASBUGGY. FINAL REPORT,	062170 P 19
#QUANTITIES OF TRITIUM IN RULISON	GAS LESS THAN PREDICTED*	007171 P 1
GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL	GAS PROCESSING PLANT* OF CONSUMER PRODUCTS FROM PROJECT	055112 P 17
#ANALYSIS SHOWS RULISON	GAS SAFE FOR POTENTIAL CUSTOMER USE*	055988 P 17
FROM RADIONUCLIDES FOUND IN NUCLEARLY STIMULATED NATURAL	GAS* #RELATIVE RISKS	078884 P 33
OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL	GAS* #RELATIVE RADIOLOGICAL IMPORTANCE	077143 P 31
OF NUCLEAR EXPLOSIVES - HYPOTHETICAL EXPOSURES TO RULISON	GAS* REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES	068566 P 25
#DISTRIBUTION AND RELEASE OF TRITIUM IN HIGH-TEMPERATURE	GAS-COOLED REACTORS AS A FUNCTION OF DESIGN, OPERATIONAL,	092744 P 38
#ENVIRONMENTAL ASPECTS OF HIGH-TEMPERATURE	GAS-COOLED REACTORS*	062380 P 19
#PREPARATION OF TRITIUM	GAS, TRITIATED WATER, AND TRITIUM TARGETS*	074326 P 28
OF NATURAL GAS FROM THE CAVITY PRODUCED BY THE PROJECT	GASBUGGY NUCLEAR SHOT* AND RADIOCHEMICAL COMPOSITION	036429 P 10
#THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT	GASBUGGY. FINAL REPORT, PHASE 1 - IMPACT OF HYPOTHETICAL	062170 P 19
#THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT	GASBUGGY. PHASE II - HYPOTHETICAL POPULATION EXPOSURES	045400 P 15
#THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT	GASBUGGY. FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS	055112 P 17
#DETECTION OF RADIOACTIVE	GASES IN THE CO2 COOLANT OF THE G2-G3 REACTORS*	030690 P 8
#FISSION-FUSION SYMBIOSIS -	GENERAL CONSIDERATIONS AND A SPECIFIC EXAMPLE*	036443 P 10
RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC	GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P.	043979 P 13
#INVESTIGATION OF TRITIUM	GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS*	014734 P 5
PLANTS* #	GENERATION AND RELEASE OF TRITIUM IN PM-TYPE NUCLEAR POWER	020575 P 6
#CENTRAL STATION POWER	GENERATION BY LASER DRIVEN FUSION*	074978 P 28
REACTORS* #TRITIUM	GENERATION IN THE COOLANT-MODERATOR OF PRESSURIZED WATER	075888 P 29
#TRITIUM HAZARDS ASSOCIATED WITH NEUTRON	GENERATORS. TECHNICAL BULLETIN NO. 105*	013202 P 4
DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES AND	GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS	076284 P 30
AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION (THE	GIVENS)* #PRESENT	080427 P 34
#TRENDS IN THE	GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961*	013282 P 4
#AEC EXEMPTS USE OF TRITIUM IN	GLOW LAMPS*	015896 P 5
AND ITS FRACTIONATION DURING UNDERGROUND SHOTS IN A	GRANITE MEDIUM* #RADIOACTIVITY	065493 P 22
#POSSIBLE CONTAMINATION OF	GROUND WATER SYSTEM BY HIGH ENERGY PROTON ACCELERATORS*	061540 P 18
BEV HIGH #ESTIMATION OF THE INDUCED RADIOACTIVITY OF THE	GROUND WATER SYSTEM IN THE NEIGHBORHOOD OF A PROPOSED 300	077311 P 33
#CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE	GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE*	076284 P 30
#DETECTION OF RADIOACTIVE GASES IN THE CO2 COOLANT OF THE	G2-G3 REACTORS*	030690 P 8
DETECTION OF RADIOACTIVE GASES IN THE CO2 COOLANT OF THE G2-	G3 REACTORS* #	030690 P 8
OF ENVIRONMENTAL HAZARDS FROM RELEASE OF KR-85 AND	H-3 IN AN EXPANDING NUCLEAR FUEL REPROCESSING INDUSTRY*	023290 P 6
#EXPERIENCE WITH HEAVY WATER MANAGEMENT IN THE	HALDEN REACTOR DURING OPERATION ON ITS SECOND FUEL CHARGE*	040008 P 12
#CONTROLLING TRITIUM	HAZARDS AROUND HEAVY WATER MODERATED REACTORS*	027977 P 7
BULLETIN NO. 105* #TRITIUM	HAZARDS ASSOCIATED WITH NEUTRON GENERATORS. TECHNICAL	013202 P 4
NUCLEAR REACTOR* #PRELIMINARY DESIGN AND	HAZARDS EVALUATION OF A D2O REFLECTOR TANK FOR THE FORD	004683 P 1
NUCLEAR FUEL REPROCESSING #EVALUATION OF ENVIRONMENTAL	HAZARDS FROM RELEASE OF KR-85 AND H-3 IN AN EXPANDING	023290 P 6
#THE POSSIBLE RADIOLOGICAL	HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM*	007399 P 1
#PRELIMINARY APPRAISAL OF THE	HAZARDS PROBLEM*	044524 P 14
#SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND	HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA*	075295 P 28
#TRITIUM EXTRACTION FROM	HEAVY WATER IN NUCLEAR REACTORS*	061133 P 18
OPERATION ON ITS SECOND FUEL CHARGE* #EXPERIENCE WITH	HEAVY WATER MANAGEMENT IN THE HALDEN REACTOR DURING	040008 P 12
#CONTROLLING TRITIUM HAZARDS AROUND	HEAVY WATER MODERATED REACTORS*	027977 P 7
BRUNSWICK AND ON #SAFETY OPINION ON THE INSTITUTION OF A	HEAVY WATER SYSTEM RESEARCH AND MEASUREMENT REACTOR IN THE	043846 P 13
#PREDICTING PERFORMANCE OF D2O STEAM TURBINES IN BOILING	HEAVY-WATER REACTORS*	009797 P 2
COMPACTS* #DETERMINATION OF THE RELEASE BEHAVIOR OF	HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO	080977 P 35
WATER SYSTEM IN THE NEIGHBORHOOD OF A PROPOSED 300 BEV	HIGH ENERGY ACCELERATOR SITUATED ON A CHALK SITE* GROUND	077311 P 33
#POSSIBLE CONTAMINATION OF GROUND WATER SYSTEM BY	HIGH ENERGY PROTON ACCELERATORS*	061540 P 18
DESIGN, #DISTRIBUTION AND RELEASE OF TRITIUM IN	HIGH-TEMPERATURE GAS-COOLED REACTORS AS A FUNCTION OF	092744 P 38
#ENVIRONMENTAL ASPECTS OF	HIGH-TEMPERATURE GAS-COOLED REACTORS*	062380 P 19
OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND	HIS ENVIRONMENT* #SYMPOSIUM	075576 P 29
* #	HISTORY OF THE MAJOR PULSES OF TRITIUM IN THE STRATOSPHERE.	054495 P 17
85 DURING PROCESSING OF THO2-UO2 FUELS* #	HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-	010702 P 2
REPORT FOR THE PERIOD ENDING AUGUST 30, 1974* #	HTGR FUELS AND CORE DEVELOPMENT PROGRAM QUARTERLY PROGRESS	093650 P 39

DECEMBER 31, 1973* # HTGR SAFETY STUDIES PROGRESS REPORT FOR THE PERIOD ENDING 100305 P 40
#A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT* 040046 P 12
#ANDREW HULL ON KRYPTON, TRITIUM* 045018 P 15
#NATURAL TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN (T1782)* 064787 P 22
#SOURCES OF TRITIUM AND ITS RADIATION- HYGIENIC PROBLEMS* 080626 P 34
SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL EXPOSURES TO RULISON GAS* ON RADIOLOGICAL 068566 P 25
SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL POPULATION EXPOSURES IN METROPOLITAN AREAS* 062229 P 19
OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. PHASE II - HYPOTHETICAL POPULATION EXPOSURES OUTSIDE SAN JUAN BASIN* 045400 P 15
FROM PROJECT GASBUGGY. FINAL REPORT, PHASE 1 - IMPACT OF HYPOTHETICAL RELEASES OF CONTAMINATED GAS IN THE SAN JUAN 062170 P 19

#FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS* 082319 P 36
#TRITIUM RETENTION IN EBR- II-IRRADIATED BORON CARBIDE* 100125 P 40
#SOME FEATURES OF THE IMPACT OF A FUSION REACTOR POWER PLANT ON THE ENVIRONMENT* 081061 P 35
#THE RADIOLOGICAL IMPACT OF FUSION* 081698 P 36
PRODUCTS FROM PROJECT GASBUGGY. FINAL REPORT, PHASE 1 - IMPACT OF HYPOTHETICAL RELEASES OF CONTAMINATED GAS IN THE 062170 P 19
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 070395 P 26
#PRELIMINARY OBSERVATIONS ON THE RADIOLOGICAL IMPLICATIONS OF FUSION POWER* 075647 P 29
MISSISSIPPI RIVER BASIN IN THE #THE POTENTIAL RADIOLOGICAL IMPLICATIONS OF NUCLEAR FACILITIES IN THE UPPER 081331 P 36
#BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE* 044674 P 14
STIMULATED NATURAL GAS* #RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY 077143 P 31
#BIOLOGICAL CONSIDERATIONS OF NONNUCLEAR INCIDENTS INVOLVING NUCLEAR WARHEADS* 065652 P 23
#REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING BURN-UP OF FUTURE FUELS* 036242 P 10
#ENVIRONMENTAL TRITIUM CONTAMINATION FROM INCREASING UTILIZATION OF NUCLEAR ENERGY SOURCES* 045079 P 15
#SCIENTISTS SHOW INDEXES OF POLLUTION* 075431 P 28
NEIGHBORHOOD OF A PROPOSED 300 BEV HIGH #ESTIMATION OF THE INDUCED RADIOACTIVITY OF THE GROUND WATER SYSTEM IN THE 077311 P 33
#TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES* 089425 P 38
#AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS* 049348 P 16
OF KR-85 AND H-3 IN AN EXPANDING NUCLEAR FUEL REPROCESSING INDUSTRY*#EVALUATION OF ENVIRONMENTAL HAZARDS FROM RELEASE 023290 P 6
#NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 24
MEASUREMENT REACTOR IN THE BRUNSWICK #SAFETY OPINION ON THE INSTITUTION OF A HEAVY WATER SYSTEM RESEARCH AND 043846 P 13
#AEC EXEMPTS USE OF TRITIUM IN MARINE NAVIGATIONAL INSTRUMENTS* 014463 P 4
#YIELDS OF TRITIUM DURING THE FISSIONING OF NUCLIDES OF INTEREST IN THE OPERATION OF NUCLEAR POWER REACTORS* 077194 P 32
RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I* 016916 P 5
#ESTIMATION OF TRITIUM DISCHARGES INTO LLW-STREAMS* 072213 P 26
DURING WEAPON TESTING* # INVENTORIES OF SELECTED LONG-LIVED RADIOISOTOPES PRODUCED 025598 P 6
ATMOSPHERIC METHANE* #ON THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN 076901 P 31
#SOURCES AND INVENTORY OF RADIOACTIVITY IN THE AQUATIC ENVIRONMENT* 077109 P 31
NUCLEAR POWER PLANTS* # INVESTIGATION OF TRITIUM GENERATION AND RELEASE IN PM 014734 P 5
#SAFETY INVOLVING DETONATION OF NUCLEAR DEVICES* 027527 P 6
#BIOLOGICAL CONSIDERATIONS OF NONNUCLEAR INCIDENTS INVOLVING NUCLEAR WARHEADS* 065652 P 23
#PRELIMINARY OBSERVATIONS OF THE RELEASE OF TRITIUM FROM IRRADIATED BERYLLIA* 011481 P 3
#TRITIUM RETENTION IN EBR-II- IRRADIATED BORON CARBIDE* 100125 P 40
#TRITIUM ANALYSIS OF MIXED-OXIDE FUEL RODS IRRADIATED IN A FAST FLUX* 080708 P 35
OF THE RELEASE BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON- IRRADIATED SINTERED BEO COMPACTS* #DETERMINATION 080977 P 35
IS NUCLEAR POWER WORTH THE RISKS* 012417 P 3
#A STUDY OF WATER PLANT ISOLATION FROM CONTAMINATION* 021802 P 11
#NUCLEAR EXPLOSIONS, RADIOACTIVE ISOTOPES, RADIONUCLIDE LEVELS, UNITED STATES* 002706 P 1
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 7
AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES 076284 P 30
MEDIUM* #RADIOACTIVITY AND ITS FRACTIONATION DURING UNDERGROUND SHOTS IN A GRANITE 065493 P 22
#ON THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN ATMOSPHERIC METHANE* 076901 P 31
#SOURCES OF TRITIUM AND ITS RADIATION-HYGIENIC PROBLEMS* 080626 P 34
WATER MANAGEMENT IN THE HALDEN REACTOR DURING OPERATION ON ITS SECOND FUEL CHARGE* #EXPERIENCE WITH HEAVY 040008 P 12
#MSBR: A REVIEW OF ITS STATUS AND FUTURE* 096216 P 39
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 28

BURNUP, CROSS SECTION, AND DOSIMETRY SEMIANNUAL REPORT, JANUARY-JUNE 1972* #CHEMICAL ENGINEERING DIVISION 080825 P 35
EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL 043979 P 13
OF HYPOTHETICAL RELEASES OF CONTAMINATED GAS IN THE SAN JUAN BASIN* GASBUGGY. FINAL REPORT, PHASE 1 - IMPACT 062170 P 19
PHASE II - HYPOTHETICAL POPULATION EXPOSURES OUTSIDE SAN JUAN BASIN* OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. 045400 P 15
RESEARCH REACTOR* # JUSTIFICATION SUPPORTING TECH SPEC CHANGES AT THE NBS 041509 P 12

#EVALUATION OF ENVIRONMENTAL HAZARDS FROM RELEASE OF KR-85 AND H-3 IN AN EXPANDING NUCLEAR FUEL REPROCESSING 023290 P 6
EXEMPTS USE OF SELF-LUMINOUS PRODUCTS CONTAINING TRITIUM, KRYPTON-85 AND PROMETHIUM-147* #AEC 036038 P 9
#HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS* 010702 P 2
#RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL GAS* 077143 P 31
UO2 REACTOR FUEL* #THE RELEASE OF TRITIUM AND KRYPTON-85 TO THE ATMOSPHERE DURING PROCESSING OF THO2 - 010526 P 2
#ANDREW HULL ON KRYPTON, TRITIUM* 045018 P 15

#RELEASE OF TRITIUM FROM TRITIUM- LABELED LUMINOUS PAINTS* 011521 P 3
IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH 064889 P 22
REACTOR TECHNOLOGY - 1972* #THE PACIFIC NORTHWEST LABORATORY ANNUAL REPORT ON CONTROLLED THERMONUCLEAR 080416 P 33
#AEC EXEMPTS USE OF TRITIUM IN GLOW LAMPS* 015896 P 5
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 17
#CENTRAL STATION POWER GENERATION BY LASER DRIVEN FUSION* 074978 P 28
TRITIUM-ACTIVATED EXIT MARKERS ON PLANES (LUMINOSITY AND LEAKAGE)* #ARMY TESTS 010982 P 2

#QUANTITIES OF TRITIUM IN RULISON GAS	LESS THAN PREDICTED*	007171 P 1
#SOCIOECONOMIC IMPACT OF LOW-	LEVEL TRITIUM RELEASES TO THE ENVIRONMENT*	070395 P 26
RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION	LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME	064889 P 22
#NUCLEAR EXPLOSIONS, RADIOACTIVE ISOTOPES, RADIONUCLIDE	LEVELS, UNITED STATES*	002706 P 1
#	LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT*	058861 P 18
#INVENTORIES OF SELECTED LONG-	LIVED RADIOISOTOPES PRODUCED DURING WEAPON TESTING*	025598 P 6
#ESTIMATION OF TRITIUM DISCHARGES INTO	LLW-STREAMS*	072213 P 26
#TRITIUM TRANSPORT IN AN	LMFBR*	097671 P 39
#TRITIUM TRANSPORT IN	LMFBR*S*	069594 P 25
#INVENTORIES OF SELECTED	LONG-LIVED RADIOISOTOPES PRODUCED DURING WEAPON TESTING*	025598 P 6
#SOCIOECONOMIC IMPACT OF	LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT*	070395 P 26
#REVIEW OF	LOW-MASS ATOM PRODUCTION IN FAST REACTORS*	044158 P 13
#ARMY TESTS TRITIUM-ACTIVATED EXIT MARKERS ON PLANES (	LUMINOSITY AND LEAKAGE)*	010982 P 2
#RELEASE OF TRITIUM FROM TRITIUM-LABELED	LUMINOUS PAINTS*	011521 P 3
PROMETHIUM-147* #AEC EXEMPTS USE OF SELF-	LUMINOUS PRODUCTS CONTAINING TRITIUM, KRYPTON-85 AND	036038 P 9
#MAN-	MADE TRITIUM*	077193 P 32
#	MAGNETIC CONTAINMENT FUSION: WHAT ARE THE PROSPECTS?*	083710 P 37
* #AN ACCOUNT OF THE	MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE	076899 P 30
#HISTORY OF THE	MAJOR PULSES OF TRITIUM IN THE STRATOSPHERE.*	054495 P 17
#SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF	MAN AND HIS ENVIRONMENT*	075576 P 29
#	MAN-MADE TRITIUM*	077193 P 32
SECOND FUEL CHARGE* #EXPERIENCE WITH HEAVY WATER	MANAGEMENT IN THE HALDEN REACTOR DURING OPERATION ON ITS	040008 P 12
APPLICATIONS OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND	MANAGEMENT OF WATER RESOURCES.* #POTENTIAL	051840 P 16
#RADIOACTIVE WASTE	MANAGEMENT PRACTICES IN WESTERN EUROPE*	072593 P 27
#RADIOACTIVE WASTE	MANAGEMENT PRACTICES IN WESTERN EUROPE*	072136 P 26
#AEC EXEMPTS USE OF TRITIUM IN	MARINE NAVIGATIONAL INSTRUMENTS*	014463 P 4
#ARMY TESTS TRITIUM-ACTIVATED EXIT	MARKERS ON PLANES (LUMINOSITY AND LEAKAGE)*	010982 P 2
#REVIEW OF LOW-	MASS ATOM PRODUCTION IN FAST REACTORS*	044158 P 13
#THE NUCLEAR PERFORMANCE OF VANADIUM AS A STRUCTURAL	MATERIAL IN FUSION REACTOR BLANKETS*	085479 P 37
COOLED REACTORS AS A FUNCTION OF DESIGN, OPERATIONAL, AND	MATERIAL PARAMETERS* OF TRITIUM IN HIGH-TEMPERATURE GAS-	092744 P 38
#	MCBRIDE DISCUSSES FUEL REPROCESSING*	045016 P 14
ON THE INSTITUTION OF A HEAVY WATER SYSTEM RESEARCH AND	MEASUREMENT REACTOR IN THE BRUNSWICK AND ON THE OPERATION	043846 P 13
#EXPERT OPINION ON THE SAFETY OF THE RESEARCH AND	MEASUREMENT REACTOR, BRUNSWICK*	043845 P 13
AND ITS FRACTIONATION DURING UNDERGROUND SHOTS IN A GRANITE	MEDIUM* #RADIOACTIVITY	065493 P 22
#TRITIUM CONTENT OF ATMOSPHERIC	METHANE AND ETHANE*	030457 P 8
#TRITIUM AND DEUTERIUM IN ATMOSPHERIC	METHANE*	030475 P 8
OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC TRITIATED	METHANE* #ROLE	030682 P 8
OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN ATMOSPHERIC	METHANE* #ON THE INVENTORY	076901 P 31
METHANE* #ROLE OF	METHYLENE IN THE PRODUCTION OF ATMOSPHERIC TRITIATED	030682 P 8
NUCLEAR EXPLOSIVES - HYPOTHETICAL POPULATION EXPOSURES IN	METROPOLITAN AREAS*RADIOLOGICAL SAFETY OF PEACEFUL USES OF	062229 P 19
SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF	MEXICO AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY	076284 P 30
IMPLICATIONS OF NUCLEAR FACILITIES IN THE UPPER	MISSISSIPPI RIVER BASIN IN THE YEAR 2000* RADIOLOGICAL	081331 P 36
#DRL EXEMPTS	MIT FROM 10CFR20 TO ALLOW TRITIUM DISCHARGE*	015305 P 5
#TRITIUM ANALYSIS OF	MIXED-OXIDE FUEL RODS IRRADIATED IN A FAST FLUX*	080[illegible] P 35
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER	MODERATED REACTORS*	027977 P 7
#TRITIUM GENERATION IN THE COOLANT-	MODERATOR OF PRESSURIZED WATER REACTORS*	075888 P 29
#TRITIUM IN	MOLTEN-SALT REACTORS*	072363 P 27
#	MSBR: A REVIEW OF ITS STATUS AND FUTURE*	096216 P 39
CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN	NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE	064889 P 22
#STUDIES OF CHEMICAL AND RADIOCHEMICAL COMPOSITION OF	NATURAL GAS FROM THE CAVITY PRODUCED BY THE PROJECT	036429 P 10
FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A	NATURAL GAS PROCESSING PLANT* OF CONSUMER PRODUCTS	055112 P 17
RISKS FROM RADIONUCLIDES FOUND IN NUCLEARLY STIMULATED	NATURAL GAS* #RELATIVE	078884 P 33
OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED	NATURAL GAS* #RELATIVE RADIOLOGICAL IMPORTANCE	077143 P 31
#	NATURAL TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN (T1782)*	064787 P 22
#AEC EXEMPTS USE OF TRITIUM IN MARINE	NAVIGATIONAL INSTRUMENTS*	014463 P 4
#JUSTIFICATION SUPPORTING TECH SPEC CHANGES AT THE	NBS RESEARCH REACTOR*	041509 P 12
#	NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS*	067891 P 24
THE INDUCED RADIOACTIVITY OF THE GROUND WATER SYSTEM IN THE	NEIGHBORHOOD OF A PROPOSED 300 BEV HIGH ENERGY ACCELERATOR	077311 P 33
#TRITIUM HAZARDS ASSOCIATED WITH	NEUTRON GENERATORS. TECHNICAL BULLETIN NO. 105*	013202 P 4
OF THE RELEASE BEHAVIOR OF HELIUM AND TRITIUM FROM	NEUTRON-IRRADIATED SINTERED BED COMPACTS* #DETERMINATION	080977 P 35
#TRITIUM AND	NOBEL-GAS FISSION PRODUCTS IN THE NUCLEAR FUEL CYCLE*	099318 P 40
#BIOLOGICAL CONSIDERATIONS OF	NONNUCLEAR INCIDENTS INVOLVING NUCLEAR WARHEADS*	065652 P 23
THERMONUCLEAR REACTOR TECHNOLOGY - 1972* #THE PACIFIC	NORTHWEST LABORATORY ANNUAL REPORT ON CONTROLLED	080416 P 33
#BIOLOGICAL IMPLICATIONS OF THE	NUCLEAR AGE*	044674 P 14
#SAFETY INVOLVING DETONATION OF	NUCLEAR DEVICES*	027527 P 6
TRITIUM CONTAMINATION FROM INCREASING UTILIZATION OF	NUCLEAR ENERGY SOURCES* #ENVIRONMENTAL	045079 P 15
#THERMAL EFFECTS OF UNDERGROUND	NUCLEAR EXPLOSION*	080690 P 34
JUNE 30, 1969* #CHEMICAL APPLICATIONS OF	NUCLEAR EXPLOSIONS (CANE) - PROGRESS REPORT FOR APRIL 1 -	038117 P 11
JUNE 30, 1971* #CHEMICAL APPLICATIONS OF	NUCLEAR EXPLOSIONS (CANE) - PROGRESS REPORT FOR APRIL 1 TO	067892 P 24
#STUDIES OF RADIOACTIVITY FROM	NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES*	064412 P 21
#FALLOUT FROM	NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS*	082319 P 36
CONTAMINATION OF COPPER RECOVERED FROM ORES FRACTURED WITH	NUCLEAR EXPLOSIONS* #RADIOACTIVE	066877 P 24
LEVELS, UNITED STATES* #	NUCLEAR EXPLOSIONS, RADIOACTIVE ISOTOPES, RADIONUCLIDE	002706 P 1
PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF	NUCLEAR EXPLOSIVES - HYPOTHETICAL EXPOSURES TO RULISON GAS*	068566 P 25
PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF	NUCLEAR EXPLOSIVES - HYPOTHETICAL POPULATION EXPOSURES IN	062229 P 19
REGIONS* #THE USE OF	NUCLEAR EXPLOSIVES FOR WATER RESOURCES DEVELOPMENT IN ARID	068115 P 25
RESOURCES.* #POTENTIAL APPLICATIONS OF	NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER	051840 P 16
CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH	NUCLEAR EXPLOSIVES. PHASE I* STUDIES RELATED TO PROPOSED	016916 P 5
#REDUCTION OF TRITIUM FROM UNDERGROUND	NUCLEAR EXPLOSIVES*	038862 P 12
#REDUCTION OF TRITIUM FROM UNDERGROUND	NUCLEAR EXPLOSIVES*	075681 P 29

THE YEAR 2000* #THE POTENTIAL RADIOLOGICAL IMPLICATIONS OF
#CHARACTERIZATION OF RADIOGASES FROM
#TRITIUM AND NOBEL-GAS FISSION PRODUCTS IN THE
HAZARDS FROM RELEASE OF KR-85 AND H-3 IN AN EXPANDING
#POWER FROM
#TRITIUM DISTRIBUTION IN THE
IN FUSION REACTOR BLANKETS* #THE
#NUCLIDES OF CONCERN IN THE ENVIRONMENTAL ASPECTS OF
#
EXPECTED RADIOLOGICAL #PRODUCTION AND RELEASE OF TRITIUM BY
#TRITIUM IN THE ENVIRONMENT FROM
#RADIATION CONSIDERATIONS IN
#GENERATION AND RELEASE OF TRITIUM IN PM-TYPE
#INVESTIGATION OF TRITIUM GENERATION AND RELEASE IN PM
LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH
THE FISSIONING OF NUCLIDES OF INTEREST IN THE OPERATION OF
#IS
#TRITIUM IN THE ENVIRONMENT FROM
AND HAZARDS EVALUATION OF A D2O REFLECTOR TANK FOR THE FORD
RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM
#TRITIUM PRODUCTION IN
#TRITIUM EXTRACTION FROM HEAVY WATER IN
#LIQUID WASTE EFFLUENTS FROM A
CONTAMINATION CONTROL*
#
GAS FROM THE CAVITY PRODUCED BY THE PROJECT GASBUGGY
#
#ARTIFICIAL RADIOACTIVITY FROM
BIOLOGICAL CONSIDERATIONS OF NONNUCLEAR INCIDENTS INVOLVING
#PRODUCTION OF TRITIUM BY
#PRODUCTION OF TRITIUM BY
#RADIOACTIVE CONTAMINATION OF OIL PRODUCED FROM
#RELATIVE RISKS FROM RADIONUCLIDES FOUND IN
RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN
NUCLEAR POWER OPERATION*
#
REACTORS* #YIELDS OF TRITIUM DURING THE FISSIONING OF

BERYLLIA* #PRELIMINARY
POWER* #PRELIMINARY
#ON THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS
#RADIOACTIVE CONTAMINATION OF
DURING THE FISSIONING OF NUCLIDES OF INTEREST IN THE
AND MEASUREMENT REACTOR IN THE BRUNSWICK AND ON THE
WITH HEAVY WATER MANAGEMENT IN THE HALDEN REACTOR DURING
#TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR
#TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR
OF CONCERN IN THE ENVIRONMENTAL ASPECTS OF NUCLEAR POWER
#PROJECT RULISON FINAL
TEMPERATURE GAS-COOLED REACTORS AS A FUNCTION OF DESIGN,
RESEARCH AND MEASUREMENT REACTOR IN THE BRUNSWICK #SAFETY
REACTOR, BRUNSWICK* #EXPERT
#RADIOACTIVE CONTAMINATION OF COPPER RECOVERED FROM
#
GASBUGGY. PHASE II - HYPOTHETICAL POPULATION EXPOSURES
#TRITIUM ANALYSIS OF MIXED-

GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD
STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-
THERMONUCLEAR REACTOR TECHNOLOGY - 1972* #THE
IN BWR, PRESSURE VESSEL DESIGN CRITERIA, AND REVISED
#RELEASE OF TRITIUM FROM TRITIUM-LABELED LUMINOUS
REACTORS AS A FUNCTION OF DESIGN, OPERATIONAL, AND MATERIAL
#
#TRITIUM CONTAMINATION IN
#TRITIUM CONTAMINATION IN
ARISING FROM THE PEACEFUL USES OF ATOMIC ENERGY -
#STUDIES OF RADIOACTIVITY FROM NUCLEAR EXPLOSIONS FOR
POPULATION* #PROSPECTS OF WIDE
FORESEEABLE #RADIOACTIVE CONTAMINATION ARISING FROM THE
#QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF
#QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF
REACTORS* #PREDICTING
REACTOR BLANKETS* #THE NUCLEAR
PACIFIC INTERCOCEANIC CANAL WITH NUCLEAR EXPLOSIVES.
EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY.
OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. FINAL REPORT,
#ARMY TESTS TRITIUM-ACTIVATED EXIT MARKERS ON
#NUCLEAR POWER
#A STUDY OF WATER
#SOME FEATURES OF THE IMPACT OF A FUSION REACTOR POWER
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING
OF TRITIUM IN A PRESSURIZED WATER POWER REACTOR
FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING

NUCLEAR FACILITIES IN THE UPPER MISSISSIPPI RIVER BASIN IN 081331 P 36
NUCLEAR FACILITIES* 077129 P 31
NUCLEAR FUEL CYCLE* 099318 P 40
NUCLEAR FUEL REPROCESSING INDUSTRY* OF ENVIRONMENTAL 023290 P 6
NUCLEAR FUSION -- PROBLEMS AND PROMISES* 076136 P 30
NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES* 089425 P 38
NUCLEAR PERFORMANCE OF VANADIUM AS A STRUCTURAL MATERIAL 085479 P 37
NUCLEAR POWER OPERATION* 044967 P 14
NUCLEAR POWER PLANT EMISSIONS* 069957 P 26
NUCLEAR POWER PLANTS AND REPROCESSING PLANTS AND THE 087968 P 38
NUCLEAR POWER PLANTS* 036855 P 10
NUCLEAR POWER PLANTS* 030778 P 9
NUCLEAR POWER PLANTS* 020575 P 6
NUCLEAR POWER PLANTS* 014734 P 5
NUCLEAR POWER REACTOR PLANTS*LEVELS AT BROOKHAVEN NATIONAL 064889 P 22
NUCLEAR POWER REACTORS* #YIELDS OF TRITIUM DURING 077194 P 32
NUCLEAR POWER WORTH THE RISKS* 012417 P 3
NUCLEAR POWERPLANTS* 076900 P 30
NUCLEAR REACTOR* #PRELIMINARY DESIGN 004683 P 1
NUCLEAR REACTORS IN CANADA* #SOME ASPECTS OF THE 075295 P 28
NUCLEAR REACTORS* 077195 P 32
NUCLEAR REACTORS* 061133 P 18
NUCLEAR REPROCESSING PLANT* 058861 P 18
NUCLEAR SAFETY, CHEMICAL REACTIONS. FISSION PRODUCT AND 014384 P 4
NUCLEAR SHOT* AND RADIOCHEMICAL COMPOSITION OF NATURAL 036429 P 10
NUCLEAR STEAM SUPPLY WATER CHEMISTRY RESEARCH* 062398 P 20
NUCLEAR TESTS UP TO NOVEMBER 1958.* 052691 P 17
NUCLEAR WARHEADS* # 065652 P 23
NUCLEAR WEAPONS* 077197 P 32
NUCLEAR WEAPONS* 013067 P 3
NUCLEAR-BROKEN SHALE* 064413 P 21
NUCLEARLY STIMULATED NATURAL GAS* 078884 P 33
NUCLEARLY STIMULATED NATURAL GAS* #RELATIVE 077143 P 31
NUCLIDES OF CONCERN IN THE ENVIRONMENTAL ASPECTS OF 044967 P 14
NUCLIDES OF INTEREST IN THE OPERATION OF NUCLEAR POWER 077194 P 32

OBSERVATIONS OF THE RELEASE OF TRITIUM FROM IRRADIATED 011481 P 3
OBSERVATIONS ON THE RADIOLOGICAL IMPLICATIONS OF FUSION 075647 P 29
OCCURRENCE IN ATMOSPHERIC METHANE* 076901 P 31
OIL PRODUCED FROM NUCLEAR-BROKEN SHALE* 064413 P 21
OPERATION OF NUCLEAR POWER REACTORS* #YIELDS OF TRITIUM 077194 P 32
OPERATION OF THE REACTOR WITH TWO CORES* SYSTEM RESEARCH 043846 P 13
OPERATION ON ITS SECOND FUEL CHARGE* #EXPERIENCE 040008 P 12
OPERATION* 033070 P 9
OPERATION* 027648 P 7
OPERATION* #NUCLIDES 044967 P 14
OPERATIONAL RADIOACTIVITY REPORT (ON THE) PRODUCTION TESTS* 031269 P 9
OPERATIONAL, AND MATERIAL PARAMETERS* OF TRITIUM IN HIGH- 092744 P 38
OPINION ON THE INSTITUTION OF A HEAVY WATER SYSTEM 043846 P 13
OPINION ON THE SAFETY OF THE RESEARCH AND MEASUREMENT 043845 P 13
ORES FRACTURED WITH NUCLEAR EXPLOSIONS* 066877 P 24
OUTLOOK FOR CONTROLLED FUSION POWER* 067566 P 24
OUTSIDE SAN JUAN BASIN* OF CONSUMER PRODUCTS FROM PROJECT 045400 P 15
OXIDE FUEL RODS IRRADIATED IN A FAST FLUX* 080708 P 35

P. RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC 043979 P 13
PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I 016916 P 5
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT ON CONTROLLED 080416 P 33
PAGES* #TRITIUM 030487 P 8
PAINTS* 011521 P 3
PARAMETERS* OF TRITIUM IN HIGH-TEMPERATURE GAS-COOLED 092744 P 38
PARAMETRIC STUDY OF THE TRITIUM DISTRIBUTION IN THE FFTF* 091964 P 38
PARTICLE ACCELERATOR OPERATION* 033070 P 9
PARTICLE ACCELERATOR OPERATION* 027648 P 7
PAST, PRESENT, AND FORESEEABLE FUTURE* CONTAMINATION 045077 P 15
PEACEFUL PURPOSES* 064412 P 21
PEACEFUL USE OF ATOMIC ENERGY WITH RADIATION SAFETY OF 038161 P 11
PEACEFUL USES OF ATOMIC ENERGY - PAST, PRESENT, AND 045077 P 15
PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL 062229 P 19
PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL 068566 P 25
PERFORMANCE OF D2O STEAM TURBINES IN BOILING HEAVY-WATER 009797 P 2
PERFORMANCE OF VANADIUM AS A STRUCTURAL MATERIAL IN FUSION 085479 P 37
PHASE I* RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC- 016916 P 5
PHASE II - HYPOTHETICAL POPULATION EXPOSURES OUTSIDE SAN 045400 P 15
PHASE 1 - IMPACT OF HYPOTHETICAL RELEASES OF CONTAMINATED 062170 P 19
PLANES (LUMINOSITY AND LEAKAGE)* 010982 P 2
PLANT EMISSIONS* 069957 P 26
PLANT ISOLATION FROM CONTAMINATION* 021802 P 11
PLANT ON THE ENVIRONMENT* 081061 P 35
PLANT* 058861 P 18
PLANT* #DISTRIBUTION 087971 P 38
PLANT* OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. 055112 P 17

#FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.* 052407 P 16
#ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* 043979 P 13
#PRODUCTION AND RELEASE OF TRITIUM BY NUCLEAR POWER PLANTS AND REPROCESSING PLANTS AND THE EXPECTED 087968 P 38
RELEASE OF TRITIUM BY NUCLEAR POWER PLANTS AND REPROCESSING PLANTS AND THE EXPECTED RADIOLOGICAL BURDEN TILL THE YEAR 087968 P 38
#TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWER PLANTS* 036855 P 10
#RADIATION CONSIDERATIONS IN NUCLEAR POWER PLANTS* 030778 P 9
#GENERATION AND RELEASE OF TRITIUM IN PM-TYPE NUCLEAR POWER PLANTS* 020575 P 6
OF TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS* #INVESTIGATION 014734 P 5
WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS*BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS 064889 P 22
PLOWSHARE AND THE ENVIRONMENT* 063905 P 21
#TRITIUM PRODUCTION IN PLOWSHARE APPLICATIONS* 077196 P 32
#INVESTIGATION OF TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS* 014734 P 5
#GENERATION AND RELEASE OF TRITIUM IN PM-TYPE NUCLEAR POWER PLANTS* 020575 P 6
#SCIENTISTS SHOW INDEXES OF POLLUTION* 075431 P 28
OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL POPULATION EXPOSURES IN METROPOLITAN AREAS* SAFETY 062229 P 19
PRODUCTS FROM PROJECT GASBUGGY, PHASE II - HYPOTHETICAL POPULATION EXPOSURES OUTSIDE SAN JUAN BASIN* OF CONSUMER 045400 P 15
WIDE PEACEFUL USE OF ATOMIC ENERGY WITH RADIATION SAFETY OF POPULATION* #PROSPECTS OF 038161 P 11
ENERGY PROTON ACCELERATORS* # POSSIBLE CONTAMINATION OF GROUND WATER SYSTEM BY HIGH 061540 P 18
ABSORBED ON TITANIUM* #THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES 007399 P 1
POTENTIAL ADVANTAGES OF FUSION POWER REACTORS* 063263 P 20
POTENTIAL ADVANTAGES OF FUSION POWER REACTORS* 069928 P 25
DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES.* # POTENTIAL APPLICATIONS OF NUCLEAR EXPLOSIVES IN 051840 P 16
#ANALYSIS SHOWS RULISON GAS SAFE FOR POTENTIAL CUSTOMER USE* 055988 P 17
IN THE UPPER MISSISSIPPI RIVER BASIN IN THE YEAR 2000* #THE POTENTIAL RADIOLOGICAL IMPLICATIONS OF NUCLEAR FACILITIES 081331 P 36
POWER FROM NUCLEAR FUSION -- PROBLEMS AND PROMISES* 076136 P 30
#CENTRAL STATION POWER GENERATION BY LASER DRIVEN FUSION* 074978 P 28
NUCLIDES OF CONCERN IN THE ENVIRONMENTAL ASPECTS OF NUCLEAR POWER OPERATION* # 044967 P 14
#NUCLEAR POWER PLANT EMISSIONS* 069957 P 26
#SOME FEATURES OF THE IMPACT OF A FUSION REACTOR POWER PLANT ON THE ENVIRONMENT* 081061 P 35
RADIOLOGICAL #PRODUCTION AND RELEASE OF TRITIUM BY NUCLEAR POWER PLANTS AND REPROCESSING PLANTS AND THE EXPECTED 087968 P 38
#TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWER PLANTS* 036855 P 10
#GENERATION AND RELEASE OF TRITIUM IN PM-TYPE NUCLEAR POWER PLANTS* 020575 P 6
#RADIATION CONSIDERATIONS IN NUCLEAR POWER PLANTS* 030778 P 9
OF TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS* #INVESTIGATION 014734 P 5
#DISTRIBUTION OF TRITIUM IN A PRESSURIZED WATER POWER REACTOR PLANT* 087971 P 38
AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS* AT BROOKHAVEN NATIONAL LABORATORY 064889 P 22
AMERICA* #SELECTED POWER REACTOR PROJECTS IN CANADA AND THE UNITED STATES OF 005375 P 1
#REPORT ON RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970* 068766 P 25
#POTENTIAL ADVANTAGES OF FUSION POWER REACTORS* 069928 P 25
#POTENTIAL ADVANTAGES OF FUSION POWER REACTORS* 063263 P 20
#ENGINEERING AND ENVIRONMENTAL ASPECTS OF FUSION POWER REACTORS* 063703 P 20
#TRITIUM IN POWER REACTORS* 037466 P 11
OF NUCLIDES OF INTEREST IN THE OPERATION OF NUCLEAR POWER REACTORS* #YIELDS OF TRITIUM DURING THE FISSIONING 077194 P 32
#IS NUCLEAR POWER WORTH THE RISKS* 012417 P 3
#OUTLOOK FOR CONTROLLED FUSION POWER* 067566 P 24
OBSERVATIONS ON THE RADIOLOGICAL IMPLICATIONS OF FUSION POWER* #PRELIMINARY 075647 P 29
#TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWERPLANTS* 076900 P 30
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072136 P 26
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072593 P 27
#QUANTITIES OF TRITIUM IN RULISON GAS LESS THAN PREDICTED* 007171 P 1
HEAVY-WATER REACTORS* # PREDICTING PERFORMANCE OF D2O STEAM TURBINES IN BOILING 009797 P 2
PRELIMINARY APPRAISAL OF THE HAZARDS PROBLEM* 044524 P 14
REFLECTOR TANK FOR THE FORD NUCLEAR REACTOR* # PRELIMINARY DESIGN AND HAZARDS EVALUATION OF A D2O 004683 P 1
IRRADIATED BERYLLIA* # PRELIMINARY OBSERVATIONS OF THE RELEASE OF TRITIUM FROM 011481 P 3
OF FUSION POWER* # PRELIMINARY OBSERVATIONS ON THE RADIOLOGICAL IMPLICATIONS 075647 P 29
REACTOR COOLANT* #A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA 040046 P 12
TARGETS* # PREPARATION OF TRITIUM GAS, TRITIATED WATER, AND TRITIUM 074326 P 28
THE GIVENS)* # PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION (080427 P 34
PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION* 062087 P 18
ARISING FROM THE PEACEFUL USES OF ATOMIC ENERGY - PAST, PRESENT, AND FORESEEABLE FUTURE*#RADIOACTIVE CONTAMINATION 045077 P 15
#TRITIUM IN BWR, PRESSURE VESSEL DESIGN CRITERIA, AND REVISED PAGES* 030487 P 8
#DISTRIBUTION OF TRITIUM IN A PRESSURIZED WATER POWER REACTOR PLANT* 087971 P 38
#TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR* 047843 P 16
#ACCUMULATION AND RELEASE OF TRITIUM IN PRESSURIZED WATER REACTORS FINAL REPORT* 095150 P 39
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 40
#ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS* 065953 P 23
#TRITIUM GENERATION IN THE COOLANT-MODERATOR OF PRESSURIZED WATER REACTORS* 075888 P 29
#PRELIMINARY APPRAISAL OF THE HAZARDS PROBLEM* 044524 P 14
#POWER FROM NUCLEAR FUSION -- PROBLEMS AND PROMISES* 076136 P 30
FUELS* #REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING BURN-UP OF FUTURE 036242 P 10
#SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS* 074325 P 27
#SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS* 080697 P 34
#SOURCES OF TRITIUM AND ITS RADIATION-HYGIENIC PROBLEMS* 080626 P 34
RELEASE OF TRITIUM AND KRYPTON-85 TO THE ATMOSPHERE DURING PROCESSING OF THO2 - UO2 REACTOR FUEL* #THE 010526 P 2
EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS* #HOT-CELL 010702 P 2
GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT* OF CONSUMER PRODUCTS FROM PROJECT 055112 P 17
RADIOCHEMICAL COMPOSITION OF NATURAL GAS FROM THE CAVITY PRODUCED BY THE PROJECT GASBUGGY NUCLEAR SHOT*CHEMICAL AND 036429 P 10
#INVENTORIES OF SELECTED LONG-LIVED RADIOISOTOPES PRODUCED DURING WEAPON TESTING* 025598 P 6
#RADIOACTIVE CONTAMINATION OF OIL PRODUCED FROM NUCLEAR-BROKEN SHALE* 064413 P 21
#NUCLEAR SAFETY, CHEMICAL REACTIONS, FISSION PRODUCT AND CONTAMINATION CONTROL* 014384 P 4
#FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.* 052407 P 16
AND REPROCESSING PLANTS AND THE EXPECTED RADIOLOGICAL # PRODUCTION AND RELEASE OF TRITIUM BY NUCLEAR POWER PLANTS 087968 P 38
#TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR* 047843 P 16
#REVIEW OF LOW-MASS ATOM PRODUCTION IN FAST REACTORS* 044158 P 13
#TRITIUM PRODUCTION IN NUCLEAR REACTORS* 077195 P 32
#TRITIUM PRODUCTION IN PLOWSHARE APPLICATIONS* 077196 P 32
#CYCLE OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC TRITIATED METHANE* 030682 P 8
PRODUCTION OF TRITIUM BY NUCLEAR WEAPONS* 013067 P 3

# PRODUCTION OF TRITIUM BY NUCLEAR WEAPONS*	077197	P 32
RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE) PRODUCTION TESTS* #PROJECT	031269	P 9
#AEC EXEMPTS USE OF SELF-LUMINOUS PRODUCTS CONTAINING TRITIUM, KRYPTON-85 AND PROMETHIUM-147*	036038	P 9
IMPACT OF HYPOTHETICAL #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. FINAL REPORT. PHASE 1 -	062170	P 19
POPULATION EXPOSURES #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. PHASE II - HYPOTHETICAL	045400	P 15
BEHAVIOR IN A NATURAL #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM	055112	P 17
#TRITIUM AND NOBEL-GAS FISSION PRODUCTS IN THE NUCLEAR FUEL CYCLE*	099318	P 40
#AEC EXEMPTS THE USE OF TRITIUM IN CERTAIN PRODUCTS*	013440	P 4
MARCH 1966* #AEC UNCLASSIFIED PROGRAMS. QUARTERLY TECHNICAL PROGRESS REPORT, JANUARY -	011152	P 2
COMPOSITION OF NATURAL GAS FROM THE CAVITY PRODUCED BY THE PROJECT GASBUGGY NUCLEAR SHOT* CHEMICAL AND RADIOCHEMICAL	036429	P 10
#THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. FINAL REPORT, PHASE 1 - IMPACT OF	062170	P 19
EXPOSURES #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. PHASE II - HYPOTHETICAL POPULATION	045400	P 15
NATURAL #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A	055112	P 17
THE) PRODUCTION TESTS* # PROJECT RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON	031269	P 9
#PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION (THE GIVENS)*	080427	P 34
#PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION*	062087	P 18
#SELECTED POWER REACTOR PROJECTS IN CANADA AND THE UNITED STATES OF AMERICA*	005375	P 1
#DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL*	083078	P 37
SELF-LUMINOUS PRODUCTS CONTAINING TRITIUM, KRYPTON-85 AND PROMETHIUM-147* #AEC EXEMPTS USE OF	036038	P 9
#POWER FROM NUCLEAR FUSION -- PROBLEMS AND PROMISES*	076136	P 30
CANAL WITH NUCLEAR #DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC	016916	P 5
OF THE GROUND WATER SYSTEM IN THE NEIGHBORHOOD OF A PROPOSED 300 BEV HIGH ENERGY ACCELERATOR SITUATED ON A	077311	P 33
RADIATION SAFETY OF POPULATION* # PROSPECTS OF WIDE PEACEFUL USE OF ATOMIC ENERGY WITH	038161	P 11
#MAGNETIC CONTAINMENT FUSION: WHAT ARE THE PROSPECTS?*	083710	P 37
#SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT*	075576	P 29
CONTAMINATION OF GROUND WATER SYSTEM BY HIGH ENERGY PROTON ACCELERATORS* #POSSIBLE	061540	P 18
OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES AND GEOCHEMISTRY	076284	P 30
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE*	076899	P 30
#HISTORY OF THE MAJOR PULSES OF TRITIUM IN THE STRATOSPHERE.*	054495	P 17
OF RADIOACTIVITY FROM NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES* #STUDIES	064412	P 21
# QUANTITIES OF TRITIUM IN RULISON GAS LESS THAN PREDICTED*	007171	P 1
GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC	043979	P 13
#PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION (THE GIVENS)*	080427	P 34
# RADIATION CONSIDERATIONS IN NUCLEAR POWER PLANTS*	030778	P 9
#ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS*	065953	P 23
OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND	064889	P 22
#PROSPECTS OF WIDE PEACEFUL USE OF ATOMIC ENERGY WITH RADIATION SAFETY OF POPULATION*	038161	P 11
#PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION*	062087	P 18
#ENVIRONMENTAL RADIATION*	079069	P 33
#SOURCES OF TRITIUM AND ITS RADIATION-HYGIENIC PROBLEMS*	080626	P 34
OF ATOMIC ENERGY - PAST, PRESENT, AND FORESEEABLE FUTURE* # RADIOACTIVE CONTAMINATION ARISING FROM THE PEACEFUL USES	045077	P 15
FRACTURED WITH NUCLEAR EXPLOSIONS* # RADIOACTIVE CONTAMINATION OF COPPER RECOVERED FROM ORES	066877	P 24
BROKEN SHALE* # RADIOACTIVE CONTAMINATION OF OIL PRODUCED FROM NUCLEAR-	064413	P 21
# RADIOACTIVE FALLOUT.*	052569	P 16
#DETECTION OF RADIOACTIVE GASES IN THE CO2 COOLANT OF THE G2-G3 REACTORS*	030690	P 8
#NUCLEAR EXPLOSIONS, RADIOACTIVE ISOTOPES, RADIONUCLIDE LEVELS, UNITED STATES*	002706	P 1
# RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE*	072593	P 27
# RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE*	072136	P 26
# RADIOACTIVE WASTES FROM FISSION REACTORS*	025055	P 6
# RADIOACTIVE WASTES FROM FUSION REACTORS.*	053739	P 17
REACTORS IN CANADA* #SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR	075295	P 28
SHOTS IN A GRANITE MEDIUM* # RADIOACTIVITY AND ITS FRACTIONATION DURING UNDERGROUND	065493	P 22
* #STUDIES OF RADIOACTIVITY FROM NUCLEAR EXPLOSIONS FOR PEACEFUL PURPOSES	064412	P 21
#ARTIFICIAL RADIOACTIVITY FROM NUCLEAR TESTS UP TO NOVEMBER 1958.*	052691	P 17
#REPORT ON RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970*	068766	P 25
#SOURCES AND INVENTORY OF RADIOACTIVITY IN THE AQUATIC ENVIRONMENT*	077109	P 31
NEIGHBORHOOD OF A PROPOSED 300 #ESTIMATION OF THE INDUCED RADIOACTIVITY OF THE GROUND WATER SYSTEM IN THE	077311	P 33
#PROJECT RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE) PRODUCTION TESTS*	031269	P 9
PRODUCED BY THE PROJECT GASBUGGY #STUDIES OF CHEMICAL AND RADIOCHEMICAL COMPOSITION OF NATURAL GAS FROM THE CAVITY	036429	P 10
ENVIRONMENT* #SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS	075576	P 29
#CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES*	077129	P 31
#INVENTORIES OF SELECTED LONG-LIVED RADIOISOTOPES PRODUCED DURING WEAPON TESTING*	025598	P 6
POWER PLANTS AND REPROCESSING PLANTS AND THE EXPECTED RADIOLOGICAL BURDEN TILL THE YEAR 2000* TRITIUM BY NUCLEAR	087968	P 38
TITANIUM* #THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON	007399	P 1
#THE RADIOLOGICAL IMPACT OF FUSION*	081698	P 36
#PRELIMINARY OBSERVATIONS ON THE RADIOLOGICAL IMPLICATIONS OF FUSION POWER*	075647	P 29
UPPER MISSISSIPPI RIVER BASIN IN THE YEAR #THE POTENTIAL RADIOLOGICAL IMPLICATIONS OF NUCLEAR FACILITIES IN THE	081331	P 36
NUCLEARLY STIMULATED NATURAL GAS* #RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN	077143	P 31
- HYPOTHETICAL EXPOSURES TO #QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES	068566	P 25
- HYPOTHETICAL POPULATION #QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES	062229	P 19
#NUCLEAR EXPLOSIONS, RADIOACTIVE ISOTOPES, RADIONUCLIDE LEVELS, UNITED STATES*	002706	P 1
#RELATIVE RISKS FROM RADIONUCLIDES FOUND IN NUCLEARLY STIMULATED NATURAL GAS*	078884	P 33
#AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS*	049348	P 16
#NUCLEAR SAFETY, CHEMICAL REACTIONS. FISSION PRODUCT AND CONTAMINATION CONTROL*	014384	P 4
PERFORMANCE OF VANADIUM AS A STRUCTURAL MATERIAL IN FUSION REACTOR BLANKETS* #THE NUCLEAR	085479	P 37
PERIOD ENDING MAY 31, 1971* # REACTOR CHEMISTRY DIVISION ANNUAL PROGRESS REPORT FOR	066435	P 23
#A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT*	040046	P 12
#EXPERIENCE WITH HEAVY WATER MANAGEMENT IN THE HALDEN REACTOR DURING OPERATION ON ITS SECOND FUEL CHARGE*	040008	P 12
85 TO THE ATMOSPHERE DURING PROCESSING OF THO2 - UO2 REACTOR FUEL* #THE RELEASE OF TRITIUM AND KRYPTON-	010526	P 2
OF A HEAVY WATER SYSTEM RESEARCH AND MEASUREMENT REACTOR IN THE BRUNSWICK AND ON THE OPERATION OF THE	043846	P 13

#DISTRIBUTION OF TRITIUM IN A PRESSURIZED WATER POWER REACTOR PLANT* 087971 P 38
SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS* AT BROOKHAVEN NATIONAL LABORATORY AND 064889 P 22
#SOME FEATURES OF THE IMPACT OF A FUSION REACTOR POWER PLANT ON THE ENVIRONMENT* 081061 P 35
* #SELECTED POWER REACTOR PROJECTS IN CANADA AND THE UNITED STATES OF AMERICA 005375 P 1
LABORATORY ANNUAL REPORT ON CONTROLLED THERMONUCLEAR REACTOR TECHNOLOGY - 1972* #THE PACIFIC NORTHWEST 080416 P 33
REACTOR IN THE BRUNSWICK AND ON THE OPERATION OF THE REACTOR WITH TWO CORES* SYSTEM RESEARCH AND MEASUREMENT 043846 P 13
#TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR* 047843 P 16
SUPPORTING TECH SPEC CHANGES AT THE NBS RESEARCH REACTOR* #JUSTIFICATION 041509 P 12
EVALUATION OF A D2O REFLECTOR TANK FOR THE FORD NUCLEAR REACTOR* #PRELIMINARY DESIGN AND HAZARDS 004683 P 1
OPINION ON THE SAFETY OF THE RESEARCH AND MEASUREMENT REACTOR, BRUNSWICK* #EXPERT 043845 P 13
AND RELEASE OF TRITIUM IN HIGH-TEMPERATURE GAS-COOLED REACTORS AS A FUNCTION OF DESIGN, OPERATIONAL, AND 092744 P 38
#ACCUMULATION AND RELEASE OF TRITIUM IN PRESSURIZED WATER REACTORS FINAL REPORT* 095150 P 39
OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* #SOME ASPECTS OF THE RELEASES 075295 P 28
#REPORT ON RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970* 068766 P 25
#TRITIUM PRODUCTION IN NUCLEAR REACTORS* 077195 P 32
#SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS* 080697 P 34
#TRITIUM IN MOLTEN-SALT REACTORS* 072363 P 27
#NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 24
#ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS* 065953 P 23
#POTENTIAL ADVANTAGES OF FUSION POWER REACTORS* 069928 P 25
#SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS* 074325 P 27
#REVIEW OF LOW-MASS ATOM PRODUCTION IN FAST REACTORS* 044158 P 13
#TRITIUM EXPERIENCE IN BOILING WATER REACTORS* 065472 P 22
#TRITIUM EXTRACTION FROM HEAVY WATER IN NUCLEAR REACTORS* 061133 P 18
#ENGINEERING AND ENVIRONMENTAL ASPECTS OF FUSION POWER REACTORS* 063703 P 20
#POTENTIAL ADVANTAGES OF FUSION POWER REACTORS* 063263 P 20
#ENVIRONMENTAL ASPECTS OF HIGH-TEMPERATURE GAS-COOLED REACTORS* 062380 P 19
#TRITIUM IN POWER REACTORS* 037466 P 11
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 7
#RADIOACTIVE WASTES FROM FISSION REACTORS* 025055 P 6
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 40
GENERATION IN THE COOLANT-MODERATOR OF PRESSURIZED WATER REACTORS* #TRITIUM 075888 P 29
OF RADIOACTIVE GASES IN THE CO2 COOLANT OF THE G2-G3 REACTORS* #DETECTION 030690 P 8
PERFORMANCE OF D2O STEAM TURBINES IN BOILING HEAVY-WATER REACTORS* #PREDICTING 009797 P 2
OF NUCLIDES OF INTEREST IN THE OPERATION OF NUCLEAR POWER REACTORS* #YIELDS OF TRITIUM DURING THE FISSIONING 077194 P 32
#RADIOACTIVE WASTES FROM FUSION REACTORS.* 053739 P 17
BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN 064889 P 22
#RADIOACTIVE CONTAMINATION OF COPPER RECOVERED FROM ORES FRACTURED WITH NUCLEAR EXPLOSIONS* 066877 P 24
REDUCTION OF TRITIUM FROM UNDERGROUND NUCLEAR EXPLOSIVES* 075681 P 29
REDUCTION OF TRITIUM FROM UNDERGROUND NUCLEAR EXPLOSIVES* 038862 P 12
#PRELIMINARY DESIGN AND HAZARDS EVALUATION OF A D2O REFLECTOR TANK FOR THE FORD NUCLEAR REACTOR* 004683 P 1
NUCLEAR EXPLOSIVES FOR WATER RESOURCES DEVELOPMENT IN ARID REGIONS* #THE USE OF 068115 P 25
BROOKHAVEN #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT 064889 P 22
INTEROCEANIC CANAL WITH NUCLEAR #DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC 016916 P 5
IN NUCLEARLY STIMULATED NATURAL GAS* # RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 077143 P 31
STIMULATED NATURAL GAS* # RELATIVE RISKS FROM RADIONUCLIDES FOUND IN NUCLEARLY 078884 P 33
IRRADIATED SINTERED BEO COMPACTS* #DETERMINATION OF THE RELEASE BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON- 080977 P 35
#INVESTIGATION OF TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS* 014734 P 5
REPROCESSING #EVALUATION OF ENVIRONMENTAL HAZARDS FROM RELEASE OF KR-85 AND H-3 IN AN EXPANDING NUCLEAR FUEL 023290 P 6
DURING 1970* #REPORT ON RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS 068766 P 25
THO2-UO2 FUELS* #HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF 010702 P 2
PROCESSING OF THO2 - UO2 REACTOR FUEL* #THE RELEASE OF TRITIUM AND KRYPTON-85 TO THE ATMOSPHERE DURING 010526 P 2
REPROCESSING PLANTS AND THE EXPECTED #PRODUCTION AND RELEASE OF TRITIUM BY NUCLEAR POWER PLANTS AND 087968 P 38
#PRELIMINARY OBSERVATIONS OF THE RELEASE OF TRITIUM FROM IRRADIATED BERYLLIA* 011481 P 3
RELEASE OF TRITIUM FROM TRITIUM-LABELED LUMINOUS PAINTS* 011521 P 3
AS A FUNCTION OF DESIGN, OPERATIONAL, AND #DISTRIBUTION AND RELEASE OF TRITIUM IN HIGH-TEMPERATURE GAS-COOLED REACTORS 092744 P 38
#GENERATION AND RELEASE OF TRITIUM IN PM-TYPE NUCLEAR POWER PLANTS* 020575 P 6
REPORT* #ACCUMULATION AND RELEASE OF TRITIUM IN PRESSURIZED WATER REACTORS FINAL 095150 P 39
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 7
LEVELS AT BROOKHAVEN NATIONAL #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION 064889 P 22
GASBUGGY. FINAL REPORT, PHASE 1 - IMPACT OF HYPOTHETICAL RELEASES OF CONTAMINATED GAS IN THE SAN JUAN BASIN*PROJECT 062170 P 19
NUCLEAR REACTORS IN CANADA* #SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM 075295 P 28
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 070395 P 26
#TRITIUM SOURCES AND RELEASES TO THE ENVIRONMENT* 061864 P 18
#THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 10
OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT* 055112 P 17
#AEC UNCLASSIFIED PROGRAMS. QUARTERLY TECHNICAL PROGRESS REPORT, JANUARY - MARCH 1966* 011152 P 2
DIVISION BURNUP, CROSS SECTION, AND DOSIMETRY SEMIANNUAL REPORT, JANUARY-JUNE 1972* #CHEMICAL ENGINEERING 080825 P 35
OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT, PHASE 1 - IMPACT OF HYPOTHETICAL RELEASES OF 062170 P 19
FROM RELEASE OF KR-85 AND H-3 IN AN EXPANDING NUCLEAR FUEL REPROCESSING INDUSTRY*#EVALUATION OF ENVIRONMENTAL HAZARDS 023290 P 6
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 18
AND RELEASE OF TRITIUM BY NUCLEAR POWER PLANTS AND REPROCESSING PLANTS AND THE EXPECTED RADIOLOGICAL BURDEN 087968 P 38
UP OF FUTURE FUELS* # REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING BURN- 036242 P 10
#MCBRIDE DISCUSSES FUEL REPROCESSING* 045016 P 14
#FUEL REPROCESSING* 082317 P 36
#TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES* 089425 P 38
#SAFETY OPINION ON THE INSTITUTION OF A HEAVY WATER SYSTEM RESEARCH AND MEASUREMENT REACTOR IN THE BRUNSWICK AND ON 043846 P 13
#EXPERT OPINION ON THE SAFETY OF THE RESEARCH AND MEASUREMENT REACTOR, BRUNSWICK* 043845 P 13
#JUSTIFICATION SUPPORTING TECH SPEC CHANGES AT THE NBS RESEARCH REACTOR* 041509 P 12
#NUCLEAR STEAM SUPPLY WATER CHEMISTRY RESEARCH* 062398 P 20
#PROGRESS IN CONTROLLED THERMONUCLEAR RESEARCH* 066363 P 23
#THE USE OF NUCLEAR EXPLOSIVES FOR WATER RESOURCES DEVELOPMENT IN ARID REGIONS* 068115 P 25
NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES.* #POTENTIAL APPLICATIONS OF 051840 P 16
#TRITIUM RETENTION IN EBR-II-IRRADIATED BORON CARBIDE* 100125 P 40
#MSBR: A REVIEW OF ITS STATUS AND FUTURE* 096216 P 39
REVIEW OF LOW-MASS ATOM PRODUCTION IN FAST REACTORS* 044158 P 13
#TRITIUM IN BWR, PRESSURE VESSEL DESIGN CRITERIA, AND REVISED PAGES* 030487 P 8
#DIFFUSION AND COSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL* 083078 P 37

NATURAL GAS* #RELATIVE RISKS FROM RADIONUCLIDES FOUND IN NUCLEARLY STIMULATED 078884 P 33
#IS NUCLEAR POWER WORTH THE RISKS* 012417 P 3
IMPLICATIONS OF NUCLEAR FACILITIES IN THE UPPER MISSISSIPPI RIVER BASIN IN THE YEAR 2000* #THE POTENTIAL RADIOLOGICAL 081331 P 36
#FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.* 052407 P 16
#TRITIUM ANALYSIS OF MIXED-OXIDE FUEL RODS IRRADIATED IN A FAST FLUX* 080708 P 35
TRITIATED METHANE* # ROLE OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC 030682 P 8
PRODUCTION TESTS* #PROJECT RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE) 031269 P 9
#QUANTITIES OF TRITIUM IN RULISON GAS LESS THAN PREDICTED* 007171 P 1
#ANALYSIS SHOWS RULISON GAS SAFE FOR POTENTIAL CUSTOMER USE* 055988 P 17
USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL EXPOSURES TO RULISON GAS* REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL 068566 P 25

#ANALYSIS SHOWS RULISON GAS SAFE FOR POTENTIAL CUSTOMER USE* 055988 P 17
SAFETY INVOLVING DETONATION OF NUCLEAR DEVICES* 027527 P 6
HYPOTHETICAL #QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - 062229 P 19
HYPOTHETICAL #QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - 068566 P 25
OF WIDE PEACEFUL USE OF ATOMIC ENERGY WITH RADIATION SAFETY OF POPULATION* #PROSPECTS 038161 P 11
#EXPERT OPINION ON THE SAFETY OF THE RESEARCH AND MEASUREMENT REACTOR, BRUNSWICK* 043845 P 13
RESEARCH AND MEASUREMENT REACTOR IN THE BRUNSWICK AND ON # SAFETY OPINION ON THE INSTITUTION OF A HEAVY WATER SYSTEM 043846 P 13
DECEMBER 31, 1973* #HTGR SAFETY STUDIES PROGRESS REPORT FOR THE PERIOD ENDING 100305 P 40
CONTAMINATION CONTROL* #NUCLEAR SAFETY, CHEMICAL REACTIONS. FISSION PRODUCT AND 014384 P 4
#TRITIUM IN MOLTEN- SALT REACTORS* 072363 P 27
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 064785 P 21
IMPACT OF HYPOTHETICAL RELEASES OF CONTAMINATED GAS IN THE SAN JUAN BASIN* PROJECT GASBUGGY. FINAL REPORT, PHASE 1 - 062170 P 19
PHASE II - HYPOTHETICAL POPULATION EXPOSURES OUTSIDE SAN JUAN BASIN*OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY. 045400 P 15
#FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.* 052407 P 16
SCIENTISTS SHOW INDEXES OF POLLUTION* 075431 P 28
MANAGEMENT IN THE HALDEN REACTOR DURING OPERATION ON ITS SECOND FUEL CHARGE* #EXPERIENCE WITH HEAVY WATER 040008 P 12
* #CHEMICAL ENGINEERING DIVISION BURNUP, CROSS SECTION, AND DOSIMETRY SEMIANNUAL REPORT, JANUARY-JUNE 1972 080825 P 35
TESTING* #INVENTORIES OF SELECTED LONG-LIVED RADIOISOTOPES PRODUCED DURING WEAPON 025598 P 6
STATES OF AMERICA* # SELECTED POWER REACTOR PROJECTS IN CANADA AND THE UNITED 005375 P 1
PROMETHIUM-147* #AEC EXEMPTS USE OF SELF-LUMINOUS PRODUCTS CONTAINING TRITIUM, KRYPTON-85 AND 036038 P 9
ENGINEERING DIVISION BURNUP, CROSS SECTION, AND DOSIMETRY SEMIANNUAL REPORT, JANUARY-JUNE 1972* #CHEMICAL 080825 P 35
CONTAMINATION OF OIL PRODUCED FROM NUCLEAR-BROKEN SHALE* #RADIOACTIVE 064413 P 21
#FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS* 082319 P 36
FROM THE CAVITY PRODUCED BY THE PROJECT GASBUGGY NUCLEAR SHOT*CHEMICAL AND RADIOCHEMICAL COMPOSITION OF NATURAL GAS 036429 P 10
#RADIOACTIVITY AND ITS FRACTIONATION DURING UNDERGROUND SHOTS IN A GRANITE MEDIUM* 065493 P 22
#SCIENTISTS SHOW INDEXES OF POLLUTION* 075431 P 28
#ANALYSIS SHOWS RULISON GAS SAFE FOR POTENTIAL CUSTOMER USE* 055988 P 17
#THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 10
#TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 4
BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO COMPACTS* #DETERMINATION OF THE RELEASE 080977 P 35
300 BEV HIGH ENERGY ACCELERATOR SITUATED ON A CHALK SITE*GROUND WATER SYSTEM IN THE NEIGHBORHOOD OF A PROPOSED 077311 P 33
NEIGHBORHOOD OF A PROPOSED 300 BEV HIGH ENERGY ACCELERATOR SITUATED ON A CHALK SITE*OF THE GROUND WATER SYSTEM IN THE 077311 P 33
ENVIRONMENT* # SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE 070395 P 26
SODIUM TECHNOLOGY FINAL REPORT* 085331 P 37
THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* # SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO 075295 P 28
RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER 064889 P 22
PLANT ON THE ENVIRONMENT* # SOME FEATURES OF THE IMPACT OF A FUSION REACTOR POWER 081061 P 35
SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS* 080697 P 34
SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS* 074325 P 27
REACTORS* # SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER 099746 P 40
#THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM* 007399 P 1
AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO 076284 P 30
ENVIRONMENT* # SOURCES AND INVENTORY OF RADIOACTIVITY IN THE AQUATIC 077109 P 31
#TRITIUM SOURCES AND RELEASES TO THE ENVIRONMENT* 061864 P 18
#PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION (THE GIVENS)* 080427 P 34
#PRESENT AND PROJECTED SOURCES OF ENVIRONMENTAL RADIATION* 062087 P 18
ENVIRONMENT* # SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE 030129 P 7
SOURCES OF TRITIUM AND ITS RADIATION-HYGIENIC PROBLEMS* 080626 P 34
CONTAMINATION FROM INCREASING UTILIZATION OF NUCLEAR ENERGY SOURCES* #ENVIRONMENTAL TRITIUM 045079 P 15
#JUSTIFICATION SUPPORTING TECH SPEC CHANGES AT THE NBS RESEARCH REACTOR* 041509 P 12
#FISSION-FUSION SYMBIOSIS - GENERAL CONSIDERATIONS AND A SPECIFIC EXAMPLE* 036443 P 10
#SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304- STAINLESS STEEL AND ZIRCALOY-2* 099295 P 40
#SELECTED POWER REACTOR PROJECTS IN CANADA AND THE UNITED STATES OF AMERICA* 005375 P 1
RADIOACTIVE ISOTOPES, RADIONUCLIDE LEVELS, UNITED STATES* #NUCLEAR EXPLOSIONS, 002706 P 1
#CENTRAL STATION POWER GENERATION BY LASER DRIVEN FUSION* 074978 P 28
#MSBR: A REVIEW OF ITS STATUS AND FUTURE* 096216 P 39
#NUCLEAR STEAM SUPPLY WATER CHEMISTRY RESEARCH* 062398 P 20
#PREDICTING PERFORMANCE OF D20 STEAM TURBINES IN BOILING HEAVY-WATER REACTORS* 009797 P 2
EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-STAINLESS STEEL AND ZIRCALOY-2* #SURFACE 099295 P 40
#RELATIVE RISKS FROM RADIONUCLIDES FOUND IN NUCLEARLY STIMULATED NATURAL GAS* 078884 P 33
IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL GAS* #RELATIVE RADIOLOGICAL 077143 P 31
IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES* #TRITIUM DISTRIBUTION 089425 P 38
#HISTORY OF THE MAJOR PULSES OF TRITIUM IN THE STRATOSPHERE.* 054495 P 17
#ESTIMATION OF TRITIUM DISCHARGES INTO LLW- STREAMS* 072213 P 26
#THE NUCLEAR PERFORMANCE OF VANADIUM AS A STRUCTURAL MATERIAL IN FUSION REACTOR BLANKETS* 085479 P 37
NATURAL GAS FROM THE CAVITY PRODUCED BY THE PROJECT # STUDIES OF CHEMICAL AND RADIOCHEMICAL COMPOSITION OF 036429 P 10
PEACEFUL PURPOSES* # STUDIES OF RADIOACTIVITY FROM NUCLEAR EXPLOSIONS FOR 064412 P 21
1973* #HTGR SAFETY STUDIES PROGRESS REPORT FOR THE PERIOD ENDING DECEMBER 31, 100305 P 40
PACIFIC INTEROCEANIC CANAL WITH NUCLEAR #COSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC- 016916 P 5
#PARAMETRIC STUDY OF THE TRITIUM DISTRIBUTION IN THE FFTF* 091964 P 38
* #A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT 040046 P 12
#A STUDY OF WATER PLANT ISOLATION FROM CONTAMINATION* 021802 P 11
#NUCLEAR STEAM SUPPLY WATER CHEMISTRY RESEARCH* 062398 P 20
#JUSTIFICATION SUPPORTING TECH SPEC CHANGES AT THE NBS RESEARCH REACTOR* 041509 P 12

STAINLESS STEEL AND ZIRCALOY-2* # SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304- 099295 P 40
#FISSION-FUSION SYMBIOSIS - GENERAL CONSIDERATIONS AND A SPECIFIC EXAMPLE* 036443 P 10
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 17
AND HIS ENVIRONMENT* # SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN 075576 P 29
#POSSIBLE CONTAMINATION OF GROUND WATER SYSTEM BY HIGH ENERGY PROTON ACCELERATORS* 061540 P 18
ESTIMATION OF THE INCUCED RADIOACTIVITY OF THE GROUND WATER SYSTEM IN THE NEIGHBORHOOD OF A PROPOSED 300 BEV HIGH 077311 P 33
AND ON #SAFETY OPINION ON THE INSTITUTION OF A HEAVY WATER SYSTEM RESEARCH AND MEASUREMENT REACTOR IN THE BRUNSWICK 043846 P 13

DESIGN AND HAZARDS EVALUATION OF A D2O REFLECTOR TANK FOR THE FORD NUCLEAR REACTOR* #PRELIMINARY 004683 P 1
#PREPARATION OF TRITIUM GAS, TRITIATED WATER, AND TRITIUM TARGETS* 074326 P 28
#JUSTIFICATION SUPPORTING TECH SPEC CHANGES AT THE NBS RESEARCH REACTOR* 041509 P 12
ANNUAL REPORT ON CONTROLLED THERMONUCLEAR REACTOR TECHNOLOGY - 1972* #THE PACIFIC NORTHWEST LABORATORY 080416 P 33
#SODIUM TECHNOLOGY FINAL REPORT* 085331 P 37
OPERATIONAL, #DISTRIBUTION AND RELEASE OF TRITIUM IN HIGH- TEMPERATURE GAS-COOLED REACTORS AS A FUNCTION OF DESIGN, 092744 P 38
#ENVIRONMENTAL ASPECTS OF HIGH- TEMPERATURE GAS-COOLED REACTORS* 062380 P 19
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 40
#FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS* 082319 P 36
#ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* 043979 P 13
OF SELECTED LONG-LIVED RADIOISOTOPES PRODUCED DURING WEAPON TESTING* #INVENTORIES 025598 P 6
AND LEAKAGE)* #ARMY TESTS TRITIUM-ACTIVATED EXIT MARKERS ON PLANES (LUMINOSITY 010982 P 2
#ARTIFICIAL RADIOACTIVITY FROM NUCLEAR TESTS UP TO NOVEMBER 1958.* 052691 P 17
FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE) PRODUCTION TESTS* #PROJECT RULISON 031269 P 9
#QUANTITIES OF TRITIUM IN RULISON GAS LESS THAN PREDICTED* 007171 P 1
#PROJECT RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE) PRODUCTION TESTS* 031269 P 9
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE* 076899 P 30
GASBUGGY. FINAL REPORT, PHASE 1 - IMPACT OF HYPOTHETICAL # THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT 062170 P 19
GASBUGGY. PHASE II - HYPOTHETICAL POPULATION EXPOSURES # THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT 045400 P 15
GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS # THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT 055112 P 17
THERMAL EFFECTS OF UNDERGROUND NUCLEAR EXPLOSION* 080690 P 34
ENDING DECEMBER 31, 1970* # THERMONUCLEAR DIVISION, ANNUAL PROGRESS REPORT FOR PERIOD 065603 P 23
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT ON CONTROLLED THERMONUCLEAR REACTOR TECHNOLOGY - 1972* #THE 080416 P 33
#PROGRESS IN CONTROLLED THERMONUCLEAR RESEARCH* 066363 P 23
AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS* LEVELS 064889 P 22
AND KRYPTON-85 TO THE ATMOSPHERE DURING PROCESSING OF THO2 - UO2 REACTOR FUEL* #THE RELEASE OF TRITIUM 010526 P 2
THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS* #HOT-CELL EVALUATION OF 010702 P 2
REPROCESSING PLANTS AND THE EXPECTED RADIOLOGICAL BURDEN TILL THE YEAR 2000* OF TRITIUM BY NUCLEAR POWER PLANTS AND 087968 P 38
RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM* #THE POSSIBLE 007399 P 1
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 28
#TRITIUM TRANSPORT IN AN LMFBR* 097671 P 39
#TRITIUM TRANSPORT IN LMFBR'S* 069594 P 25
TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 4
#ROLE OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC TRITIATED METHANE* 030682 P 8
#PREPARATION OF TRITIUM GAS, TRITIATED WATER, AND TRITIUM TARGETS* 074326 P 28
FAST FLUX* # TRITIUM ANALYSIS OF MIXED-OXIDE FUEL RODS IRRADIATED IN A 080708 P 35
TRITIUM AND DEUTERIUM IN ATMOSPHERIC METHANE* 030475 P 8
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 7
#ON THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN ATMOSPHERIC METHANE* 076901 P 31
#SOURCES OF TRITIUM AND ITS RADIATION-HYGIENIC PROBLEMS* 080626 P 34
#HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS* 010702 P 2
#RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL GAS* 077143 P 31
OF THO2 - UO2 REACTOR FUEL* #THE RELEASE OF TRITIUM AND KRYPTON-85 TO THE ATMOSPHERE DURING PROCESSING 010526 P 2
CYCLE* # TRITIUM AND NOBEL-GAS FISSION PRODUCTS IN THE NUCLEAR FUEL 099318 P 40
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE* 076899 P 30
#FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.* 052407 P 16
OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT* 055112 P 17
AND THE EXPECTED RADIOLOGICAL #PRODUCTION AND RELEASE OF TRITIUM BY NUCLEAR POWER PLANTS AND REPROCESSING PLANTS 087968 P 38
#PRODUCTION OF TRITIUM BY NUCLEAR WEAPONS* 077197 P 32
#PRODUCTION OF TRITIUM BY NUCLEAR WEAPONS* 013067 P 3
#A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT* 040046 P 12
NUCLEAR ENERGY SOURCES* #ENVIRONMENTAL TRITIUM CONTAMINATION FROM INCREASING UTILIZATION OF 045079 P 15
TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION* 027648 P 7
TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION* 033070 P 9
#NATURAL TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN (T1782)* 064787 P 22
TRITIUM CONTENT OF ATMOSPHERIC METHANE AND ETHANE* 030457 P 8
#ORL EXEMPTS MIT FROM 10CFR20 TO ALLOW TRITIUM DISCHARGE* 015305 P 5
#ESTIMATION OF TRITIUM DISCHARGES INTO LLW-STREAMS* 072213 P 26
#PARAMETRIC STUDY OF THE TRITIUM DISTRIBUTION IN THE FFTF* 091964 P 38
REQUIREMENTS FOR CONTROL STRATEGIES* # TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE 089425 P 38
THE OPERATION OF NUCLEAR POWER REACTORS* #YIELDS OF TRITIUM DURING THE FISSIONING OF NUCLIDES OF INTEREST IN 077194 P 32
TRITIUM EXPERIENCE IN BOILING WATER REACTORS* 065472 P 22
TRITIUM EXTRACTION FROM HEAVY WATER IN NUCLEAR REACTORS* 061133 P 18
#PRELIMINARY OBSERVATIONS OF THE RELEASE OF TRITIUM FROM IRRADIATED BERYLLIA* 011481 P 3
#DETERMINATION OF THE RELEASE BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO COMPACTS* 080977 P 35
#RELEASE OF TRITIUM FROM TRITIUM-LABELED LUMINOUS PAINTS* 011521 P 3
#PRODUCTION OF TRITIUM FROM UNDERGROUND NUCLEAR EXPLOSIVES* 038862 P 12
#REDUCTION OF TRITIUM FROM UNDERGROUND NUCLEAR EXPLOSIVES* 075681 P 29
#PREPARATION OF TRITIUM GAS, TRITIATED WATER, AND TRITIUM TARGETS* 074326 P 28
#INVESTIGATION OF TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS* 014734 P 5
WATER REACTORS* # TRITIUM GENERATION IN THE COOLANT-MODERATOR OF PRESSURIZED 075888 P 29
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 7
TECHNICAL BULLETIN NO. 105* # TRITIUM HAZARDS ASSOCIATED WITH NEUTRON GENERATORS. 013202 P 4
#DISTRIBUTION OF TRITIUM IN A PRESSURIZED WATER POWER REACTOR PLANT* 087971 P 38
REVISED PAGES* # TRITIUM IN BWR, PRESSURE VESSEL DESIGN CRITERIA, AND 030487 P 8
#AEC EXEMPTS THE USE OF TRITIUM IN CERTAIN PRODUCTS* 013440 P 4
#SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS* 074325 P 27

#SOME PROBLEMS ASSCCIATED WITH TRITIUM IN FUSION REACTORS* 080697 P 34
#AEC EXEMPTS USE OF TRITIUM IN GLOW LAMPS* 015896 P 5
FUNCTION OF DESIGN, #DISTRIBUTION AND RELEASE OF TRITIUM IN HIGH-TEMPERATURE GAS-COOLED REACTORS AS A 092744 P 38
#AEC EXEMPTS USE OF TRITIUM IN MARINE NAVIGATIONAL INSTRUMENTS* 014463 P 4
TRITIUM IN MOLTEN-SALT REACTORS* 072363 P 27
#GENERATION AND RELEASE OF TRITIUM IN PM-TYPE NUCLEAR POWER PLANTS* 020575 P 6
TRITIUM IN POWER REACTORS* 037466 P 11
#ACCUMULATION AND RELEASE OF TRITIUM IN PRESSURIZED WATER REACTORS FINAL REPORT* 095150 P 39
#QUANTITIES OF TRITIUM IN PULISON GAS LESS THAN PREDICTED* 007171 P 1
* # TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN 074536 P 28
# TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWER PLANTS* 036855 P 10
# TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWERPLANTS* 076900 P 30
* #CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE 076284 P 30
#HISTORY OF THE MAJOR PULSES OF TRITIUM IN THE STRATOSPHERE.* 054495 P 17
#SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-STAINLESS STEEL AND ZIRCALOY-2* 099295 P 40
TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR* 047843 P 16
TRITIUM PRODUCTION IN NUCLEAR REACTORS* 077195 P 32
TRITIUM PRODUCTION IN PLOWSHARE APPLICATIONS* 077196 P 32
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 070395 P 26
#THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 10
TRITIUM RETENTION IN EBR-II-IRRADIATED BORON CARBIDE* 100125 P 40
#TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 4
#THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM* 007399 P 1
TRITIUM SOURCES AND RELEASES TO THE ENVIRONMENT* 061864 P 18
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 17
#PREPARATION OF TRITIUM GAS, TRITIATED WATER, AND TRITIUM TARGETS* 074326 P 28
TRITIUM TRANSPORT IN AN LMFBR* 097671 P 39
TRITIUM TRANSPORT IN LMFBR'S* 069594 P 25
#ENVIRONMENTAL BURDENING BY TRITIUM* 072991 P 27
#MAN-MADE TRITIUM* 077193 P 32
#ANDREW HULL ON KRYPTON, TRITIUM* 045018 P 15
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 064785 P 21
LEAKAGE)* #ARMY TESTS TRITIUM-ACTIVATED EXIT MARKERS ON PLANES (LUMINOSITY AND 010982 P 2
#RELEASE OF TRITIUM FROM TRITIUM-LABELED LUMINOUS PAINTS* 011521 P 3
#AEC EXEMPTS USE OF SELF-LUMINOUS PRODUCTS CONTAINING TRITIUM, KRYPTON-85 AND PROMETHIUM-147* 036038 P 9
#A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT* 040046 P 12
#PREDICTING PERFORMANCE OF D2O STEAM TURBINES IN BOILING HEAVY-WATER REACTORS* 009797 P 2
IN THE BRUNSWICK AND ON THE OPERATION OF THE REACTOR WITH TWO CORES* WATER SYSTEM RESEARCH AND MEASUREMENT REACTOR 043846 P 13
#GENERATION AND RELEASE OF TRITIUM IN PM- TYPE NUCLEAR POWER PLANTS* 020575 P 6
#NATURAL TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN (T1782)* 064787 P 22

REPORT, JANUARY - MARCH 1966* #AEC UNCLASSIFIED PROGRAMS, QUARTERLY TECHNICAL PROGRESS 011152 P 2
#THERMAL EFFECTS OF UNDERGROUND NUCLEAR EXPLOSION* 080690 P 34
#REDUCTION OF TRITIUM FROM UNDERGROUND NUCLEAR EXPLOSIVES* 075681 P 29
#REDUCTION OF TRITIUM FROM UNDERGROUND NUCLEAR EXPLOSIVES* 038862 P 12
#RADIOACTIVITY AND ITS FRACTIONATION DURING UNDERGROUND SHOTS IN A GRANITE MEDIUM* 065493 P 22
#SELECTED POWER REACTOR PROJECTS IN CANADA AND THE UNITED STATES OF AMERICA* 005375 P 1
EXPLOSIONS, RADIOACTIVE ISOTOPES, RADIONUCLIDE LEVELS, UNITED STATES* #NUCLEAR 002706 P 1
RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2- UO2 FUELS* #HOT-CELL EVALUATION OF THE 010702 P 2
KRYPTON-85 TO THE ATMOSPHERE DURING PROCESSING OF THO2 - UO2 REACTOR FUEL* #THE RELEASE OF TRITIUM AND 010526 P 2
#REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING BURN- UP OF FUTURE FUELS* 036242 P 10
#ARTIFICIAL RADIOACTIVITY FROM NUCLEAR TESTS UP TO NOVEMBER 1958.* 052691 P 17
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 7
RADIOLOGICAL IMPLICATIONS OF NUCLEAR FACILITIES IN THE UPPER MISSISSIPPI RIVER BASIN IN THE YEAR 2000* POTENTIAL 081331 P 36
#PROSPECTS OF WIDE PEACEFUL USE OF ATOMIC ENERGY WITH RADIATION SAFETY OF POPULATION* 038161 P 11
IN ARID REGIONS* #THE USE OF NUCLEAR EXPLOSIVES FOR WATER RESOURCES DEVELOPMENT 068115 P 25
85 AND PROMETHIUM-147* #AEC EXEMPTS USE OF SELF-LUMINOUS PRODUCTS CONTAINING TRITIUM, KRYPTON- 036038 P 9
#AEC EXEMPTS THE USE OF TRITIUM IN CERTAIN PRODUCTS* 013440 P 4
#AEC EXEMPTS USE OF TRITIUM IN GLOW LAMPS* 015896 P 5
#AEC EXEMPTS USE OF TRITIUM IN MARINE NAVIGATIONAL INSTRUMENTS* 014463 P 4
#ANALYSIS SHOWS PULISON GAS SAFE FOR POTENTIAL CUSTOMER USE* 055988 P 17
FUTURE*#RADIOACTIVE CONTAMINATION ARISING FROM THE PEACEFUL USES OF ATOMIC ENERGY - PAST, PRESENT, AND FORESEEABLE 045077 P 15
PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL EXPOSURES TO 068566 P 25
PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - HYPOTHETICAL POPULATION 062229 P 19
#IN THE UTILITIES* 044068 P 13
#ENVIRONMENTAL TRITIUM CONTAMINATION FROM INCREASING UTILIZATION OF NUCLEAR ENERGY SOURCES* 045079 P 15

BLANKETS* #THE NUCLEAR PERFORMANCE OF VANADIUM AS A STRUCTURAL MATERIAL IN FUSION REACTOR 085479 P 37
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 17
#TRITIUM IN BWR, PRESSURE VESSEL DESIGN CRITERIA, AND REVISED PAGES* 030487 P 8

DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL* # 083078 P 37
CONSIDERATIONS OF NONNUCLEAR INCIDENTS INVOLVING NUCLEAR WARHEADS* #BIOLOGICAL 065652 P 23
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 18
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072593 P 27
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072136 P 26
#RADIOACTIVE WASTES FROM FISSION REACTORS* 025055 P 6
#RADIOACTIVE WASTES FROM FUSION REACTORS.* 053739 P 17
#NUCLEAR STEAM SUPPLY WATER CHEMISTRY RESEARCH* 062398 P 20

#TRITIUM EXTRACTICN FROM HEAVY WATER IN NUCLEAR REACTORS* 061133 P 18
ITS SECOND FUEL CHARGE* #EXPERIENCE WITH HEAVY WATER MANAGEMENT IN THE HALDEN REACTOR DURING OPERATION ON 040008 P 12
#CONTRCLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 7
#A STUDY OF WATER PLANT ISOLATION FROM CONTAMINATION* 021802 P 11
#DISTRIBUTION OF TRITIUM IN A PRESSURIZED WATER POWER REACTOR PLANT* 087971 P 38
#TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR* 067843 P 16
#ACCUMULATICN AND RELEASE OF TRITIUM IN PRESSURIZED WATER REACTORS FINAL REPORT* 095150 P 39
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 40
#TRITIUM EXPERIENCE IN BOILING WATER REACTORS* 065472 P 22
#ENVIRONMENTAL RADIATICN FROM PRESSURIZED WATER REACTORS* 065953 P 23
#TRITIUM GENERATION IN THE COOLANT-MODERATOR OF PRESSURIZED WATER REACTORS* 075888 P 29
PERFORMANCE OF D2O STEAM TURBINES IN BOILING HEAVY-WATER REACTORS* #PREDICTING 009797 P 2
#THE USE OF NUCLEAR EXPLOSIVES FOR WATER RESOURCES DEVELOPMENT IN ARID REGIONS* 068115 P 25
OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES.* #POTENTIAL APPLICATIONS 051840 P 16
#POSSIBLE CONTAMINATICN CF GROUND WATER SYSTEM BY HIGH ENERGY PROTON ACCELERATORS* 061540 P 18
HIGH #ESTIMATION OF THE INCUCED RADIOACTIVITY OF THE GROUND WATER SYSTEM IN THE NEIGHBORHOOD OF A PROPOSED 300 BEV 077311 P 33
BRUNSWICK AND #SAFETY OPINION ON THE INSTITUTION OF A HEAVY WATER SYSTEM RESEARCH AND MEASUREMENT REACTOR IN THE 043846 P 13
#PREPARATION OF TRITIUM GAS, TRITIATED WATER, AND TRITIUM TARGETS* 074326 P 28
OF SELECTED LONG-LIVED RADIOISOTOPES PRODUCED DURING WEAPON TESTING* #INVENTORIES 025598 P 6
#PRODUCTION CF TRITIUM BY NUCLEAR WEAPONS* 013067 P 3
#PRODUCTION CF TRITIUM BY NUCLEAR WEAPONS* 077197 P 32
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072136 P 26
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072593 P 27
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 40
#MAGNETIC CONTAINMENT FUSION: WHAT ARE THE PROSPECTS?* 083710 P 37
AND DOSE CALCULATICNS FOR PROJECTS RIO BLANCO AND WAGON WHEEL* #DIFFUSION 083078 P 37
OF POPULATICN* #PROSPECTS OF WIDE PEACEFUL USE OF ATOMIC ENERGY WITH RADIATION SAFETY 038161 P 11
#IS NUCLEAR POWER WORTH THE RISKS* 012417 P 3

FACILITIES IN THE UPPER MISSISSIPPI RIVER BASIN: IN THE YEAR 2000* POTENTIAL RADIOLOGICAL IMPLICATIONS OF NUCLEAR 081331 P 36
PLANTS AND THE EXPECTED RADIOLOGICAL BURDEN TILL THE YEAR 2000*TRITIUM BY NUCLEAR POWER PLANTS AND REPROCESSING 087968 P 38
INTEREST IN THE OPERATION OF NUCLEAR POWER REACTORS* # YIELDS OF TRITIUM DURING THE FISSIONING OF NUCLIDES OF 077194 P 32

ON THE DIFFUSICN OF TRITIUM IN 304-STAINLESS STEEL AND ZIRCALOY-2* #SURFACE EFFECTS 099295 P 40

II Operating Experience

II - OPERATING EXPERIENCE

002551
ROBINSON WL + ANSPAUGH LR
ASSESSMENT OF POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT RULISON
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-50791 +. 35 PAGES, FIGURES, TABLES, REFERENCES, DECEMBER 18, 1969

THIS REPORT EVALUATES THE OFF-SITE RADIOLOGICAL HAZARDS ASSOCIATED WITH THE PROPOSED REENTRY AND TESTING OPERATIONS. WHEN FLARING OF THE NATURAL GAS IS BEGUN THE MAJOR ISOTOPE TO BE RELEASED WILL BE TRITIUM. THE REPORT THEREFORE CONSIDERS SEVERAL QUESTIONS CONCERNING THE BIOLOGY AND PHYSICS OF TRITIUM IN THE LIGHT OF THE DATA AVAILABLE IN THE LITERATURE. THE GENERAL CONCLUSIONS ARE THAT ORDINARY CALCULATIONS OF ABSORBED DOSE BASED ON ENERGY UNIFORMLY DISTRIBUTED THROUGHOUT A VOLUME ARE SUFFICIENT TO DESCRIBE THE OBSERVED EFFECTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + DOSIMETRY + *PLOWSHARE + HAZARD, RELATIVE + TESTING + *NUCLEAR DETONATION + *DOSE CALCULATION, EXTERNAL + *RADIOBIOLOGY + GAS + *OFF SITE + CONSUMER PRODUCT + ABSORPTION + *CONCENTRATION + RADIATION EFFECT

003200
SELECTED ITEMS OF INTEREST
SOUTHERN CALIFORNIA EDISON COMPANY
DOCKET 50-206 +. 8 PAGES, SAN ONOFRE SEMIANNUAL REPORT NO. 6, JULY 10, 1970, TYPE--PWR, MFG--WEST., AE--BECHTEL

ONE OF A SERIES OF OPERATING REPORTS. TOPICS INCLUDE HOURS OF USE, SHUTDOWNS, RADIOACTIVITY LEVELS, ROUTINE RELEASES, TESTING, AND DESIGN CHANGES AND MAINTENANCE. *** REACTOR WAS TAKEN OFF LINE TWICE, ONCE FOR A ROUTINE TURBINE TEST AND MISCELLANEOUS MAINTENANCE AND ONCE TO REPAIR A REHEATER TUBE LEAK AND TO MODIFY PACKING ON SEVERAL VALVES. DURING STARTUP, THE REACTOR WAS TRIPPED WHEN THE TURBINE ACCELERATION RATE WAS EXCESSIVE. *** LIQUID RELEASES INCLUDED A TOTAL OF 1.81 CURIES OF BETA-GAMMA AND 2742 CURIES OF TRITIUM. GASEOUS RELEASES HAD A TOTAL OF 848 CURIES OF BETA-GAMMA AND 6.2 CURIES OF TRITIUM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

MAINTENANCE AND REPAIR + *REPORT, OPERATIONS + REACTOR, PWR + SAN ONOFRE 1 (PWR) + MODIFICATION + *RADIOACTIVITY RELEASE + GAS + LIQUID + *OPERATING EXPERIENCE

003269
MORECRAFT WT
TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR
ATOMIC ENERGY OF CANADA, LIMITED, CHALK RIVER, ONTARIO, CANADA
4 PAGES, 2 FIGURES, 1 TABLE, 2 REFERENCES- AM. INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 24- 87-90 (1963)- AECL-1697

TO CONTROL THE HAZARDS OF TRITIUM EXPOSURES AT THE NRU REACTOR OF ATOMIC ENERGY OF CANADA LIMITED, A VARIED SAFETY PROGRAM EMPHASIZES EDUCATION, MONITORING, EXHAUST VENTILATION, PROTECTIVE CLOTHING, AND BIOCHEMICAL ANALYSES FOR TRITIUM IN THE BODY. THE ICRP STANDARD OF 5 X 10 MINUS 6 MU C/CM 3 IS USED FOR MAXIMAL PERMISSIBLE EXPOSURE. TRITIUM RELEASE IS CONTROLLED BY OPERATIONAL PROCEDURES AND VENTILATION.

CANADA + HEALTH PHYSICS TRAINING + REACTOR, HWR + *PERSONNEL PROTECTIVE DEVICE + *RADIATION SAFETY AND CONTROL

004276
JACKSON RF
EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
15 PAGES, 4 FIGURES, 1 TABLE, 7 REFERENCES- MAY 1964, A/CONF. 28/P.123- PRESENTED AT THIRD U. N. INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, AUGUST 31-SEPTEMBER 9, 1964- IAEA

THE PRINCIPAL FEATURES OF THE THREE SIMILAR U.K. HEAVY WATER HIGH FLUX RESEARCH REACTOR, DIDO AND PLUTO AT HARWELL AND THE DOUNREAY MATERIALS TESTING REACTOR ARE BRIEFLY RECALLED. BRIEF MENTION IS MADE OF THE HEALTH PHYSICS ARRANGEMENT TO DETECT AND CONTROL LEAKAGE OF RADIOACTIVE SPECIES FROM EITHER THE REACTOR OR EXPERIMENTS INTO THE ENVIRONMENT. EXPERIENCE OF TRITIUM IS PARTICULARLY DISCUSSED.

MONITOR, GENERAL PRACTICE + *REACTOR, RESEARCH + *UNITED KINGDOM + OPERATING EXPERIENCE SUMMARY

004361
MATICVUKMIROVIC Z + RIBNIKAR SV + BEKUZAROV D + DOBRILOVIC L + HADZISEHOVIC H
DETERMINATION OF THE TRITIUM BUILD-UP IN A HEAVY WATER MODERATED REACTOR
BORIS KIDRIC INSTITUTE OF NUCLEAR SCIENCES, YUGOSLAVIA
18 PAGES, 2 FIGURES, 3 TABLES, 13 REFERENCES- MAY 1964, A/CONF. 28/P/709- PRESENTED AT THIRD U. N. INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, AUGUST 31-SEPTEMBER 9, 1964- IAEA

FROM OCTOBER 1959 TO NOVEMBER 1963 THE BUILD-UP AND DISTRIBUTION OF TRITIUM WAS INVESTIGATED IN THE RA REACTOR AT VINCA, YUGOSLAVIA. AN INCREASE OF THE TRITIUM ACTIVITY FROM 2 TO 570 MICROCURIES PER MILLILITER OF HEAVY WATER WAS FOUND. THE TRITIUM BUILD-UP CORRESPONDS TO THE

004361 *CONTINUED*
REACTOR POWER HISTORY. IT WAS SHOWN THAT TRITIUM DOES NOT ESCAPE SIGNIFICANTLY FROM THE HEAVY WATER WITH THE HYDROGEN GAS FORMED BY RADIOLYSIS. IT IS MAINLY RETAINED IN THE HEAVY WATER OWING TO A RADIATION CATALYZED CHEMICAL EXCHANGE REACTION AND KINETIC ISOTOPE EFFECTS.

REACTOR, HWR

004414
NUSSBAUM E
DIFFUSION OF RADIOACTIVE GASES THROUGH FILMS
TAYLOR UNIVERSITY, UPLAND, INDIANA
4 PAGES, 2 FIGURES- ABSTRACT ONLY AVAILABLE, TID-7688- OAK RIDGE RADIOISOTOPE CONFERENCE, RESEARCH APPLICATIONS TO PHYSICAL SCIENCE AND ENGINEERING, APRIL 1-3, 1963, PP. 64-67- OTS

THE RATE AT WHICH RADON, TRITIUM OR TRITIATED METHANE IS TRANSMITTED THROUGH THE SHEET OR FILM IS EVALUATED BY MEASURING CHANGES IN CONCENTRATION OF THE RADIOACTIVE GAS IN EACH FLASK AS A FUNCTION OF TIME. THESE CHANGES ARE EVALUATED BY WITHDRAWING DUPLICATE SAMPLES OF GAS PERIODICALLY FROM EACH FLASK INTO EVACUATED 1 ML. GLASS SAMPLING TUBES. RADON GAS SAMPLES ARE ASSAYED BY COUNTING THE GAMMA DECAY PRODUCTS WITH A WELL-TYPE NAI SCINTILLATION DETECTOR. THE TRITIUM CONTENT OF THE GAS SAMPLES IS ASSESSED WITH THE VIBRATING REED ELECTROMETER. GAS TRANSMISSION RATES HAVE BEEN INVESTIGATED AT ROOM TEMPERATURE, AT 0 DEGREE AND AT 100 DEGREE C. TYPICAL CURVES ARE SHOWN IN FIG. 2.

*DIFFUSION + ELEMENTS AND ISOTOPES

006242
WOOLLEN WB + FLEW EM + COOK JE + GARDINER RL + JAMES BT + MARTIN A
HEALTH PHYSICS CONTROL OF A.E.R.E. RESEARCH REACTORS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
67 PAGES, FIGURES, TABLES, REFERENCES, MARCH 1964, AERE-R 4528- HMSO

A BRIEF DESCRIPTION IS PROVIDED OF THE AERE REACTORS. THE NATURE OF THE HAZARDS INVOLVED IN THEIR OPERATION IS SURVEYED AND CONTROL AND SAFETY MEASURES ARE DESCRIBED. POTENTIAL HAZARDS FROM TRITIUM EXPOSURE ARE REVIEWED. THE PONDS AND FACILITIES FOR STORING SPENT FUEL ELEMENTS FROM DIDO REACTORS ARE DESCRIBED.

*INCIDENT, EXPOSURE + *DEUTERIUM + EFFLUENT + FISSION PRODUCT RELEASE + FUEL HANDLING + IODINE + MONITOR, PERSONNEL + HAZARD, RELATIVE + FUEL STORAGE + *UNITED KINGDOM + ARGON + MPD + PLANT PROTECTIVE SYSTEM + MONITOR + *PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + CONCENTRATION + MAN

006456
BAKKEN OK + FIRING JA + JAMNE E + KNUDSEN KD + WULLUM T + OVREEIDE M
OPERATING EXPERIENCE WITH HBWR ON ITS SECOND FUEL CHARGE
INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY
62 PAGES, FIGURES, TABLES, NOVEMBER 1964, HPR-46- HMSO

MEASUREMENTS MADE OF VARIOUS ELEMENT TEMPERATURE AT POWER TO ESTABLISH BURNOUT LIMITS. FOUR HEAVY WATER-LOSS INCIDENTS- ONE WAS LEAKAGE OF REACTOR COOLANT THROUGH TWO SERIES VALVES LOCKED CLOSED WHEN COLD. HEATING VALVES ALLOWED A SLIGHT OPENING- RESULTANT VIBRATION CAUSED MORE LEAKAGE INTO A HOLDUP TANK. THE HOLDUP TANK WAS VENTED THROUGH A MOISTURE TRAP AND PLASTIC TUBING. THE PLASTIC TUBE COULD NOT WITHSTAND THE HIGH TEMPERATURE STEAM. THE LEAKAGE RESULTED IN A POWER LEVEL DECREASE CAUSED BY LOW REACTOR WATER LEVEL. MORE GRAPHIC PANELS WERE ADDED TO LESSEN MAL-OPERATION. UNIQUE WATER LEVEL DETECTION USES 2 NEUTRON DETECTORS.

ADMINISTRATIVE CONTROL + REACTOR, BWR + *BURNOUT HEAT FLUX + REACTOR, HWR + FAILURE, PIPE + SCRAM, REAL + OUT OF PILE EXPERIMENT + OPERATING EXPERIENCE SUMMARY + *INCIDENT, EQUIPMENT + INSTRUMENT, LIQUID LEVEL + NORWAY + *TECHNICAL SPECIFICATIONS + RADIATION SAFETY AND CONTROL

007122
BROWN DJ
CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY-DECEMBER, 1964
HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
23 PAGES- 1964, HW-84549- CFSTI

THE CONCENTRATION OF RADIONUCLIDES DETECTED IN GROUND WATER SAMPLES COLLECTED DURING 1963 AND 1964 FROM OVER 500 MONITORING WELLS AT BATTELLE NORTHWEST ARE REPORTED. IN ADDITION, GROSS BETA RESULTS OF WATER SAMPLES TAKEN FROM CONFINED AQUIFERS ARE PRESENTED AND THE RESULTS OF SPECIAL TRITIUM ANALYSES ARE REPORTED.

GEOLOGY + GROUND WATER + MONITOR, LIQUID + *WASTE DISPOSAL + GROSS BETA + *GROUND WATER, NUCLIDE OCCURRENCE + GROUND WATER, TRACER + BATTELLE NORTHWEST

009022
KARP W
TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966
TRACERLAB
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12(12)- 31 (MARCH 21, 1966)

009022 *CONTINUED*
VARIOUS TRITIUM CONTAMINATED OBJECTS WERE DOUBLE BAGGED, AND PLACED IN WASTE DRUMS TO BE CEMENTED IN. EITHER DURING THE CEMENT POURING OR PUSHING DOWN A FLOATING OBJECT, TRITIUM MUST HAVE BEEN RELEASED.

*WASTE DISPOSAL + *PERSONNEL EXPOSURE, RADIATION

009025
PUECHL KH
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966
NUCLEAR MATERIALS AND EQUIPMENT CORPORATION
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12(12)- 28 (MARCH 21, 1966)

A TRITIUM EXPOSURE MAY RESULT IN A WHOLE BODY EXPOSURE OF 5 REM, DUE TO HANDLING TRITIATED WATER DURING PRODUCTION OF AN ORGANIC COMPOUND.

*PERSONNEL EXPOSURE, RADIATION + *INCIDENT, NONREACTOR

009302
KILLIAN CB
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(15) PAGE 46, APRIL 11, 1966

A CHEMIST OPENED AN EVACUATED SYSTEM SEVERAL TIMES IN A HOOD, TO ADD MATERIAL TO TRITIATED WATER. HIS CUMULATIVE INTERNAL EXPOSURE WAS 4.26 REMS DURING A THREE-WEEK PERIOD.

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION

010200
TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.
DIVISION OF STATE AND LICENSEE RELATIONS, USAEC
2 PAGES, APRIL 14, 1966, ATOMIC ENERGY CLEARING HOUSE, 12(22), PAGES 20-21 (MAY 30, 1966)

AEC INSPECTION REVEALED THAT EMPLOYEES LEAVING TRITIUM PAINTING AREAS HAD 59,000 DIS/MIN OF REMOVABLE TRITIUM ON THEIR HANDS AND STREET SHOES. EMPLOYEES HAD MONITORED THEMSELVES WITH AN ULTRAVIOLET LIGHT (USED FOR LUMINOUS PAINT) INEFFECTIVE AGAINST TRITIUM. IN ADDITION, CONTAMINATED CLOTHES ARE REUSED WITHOUT WASHING, INADEQUATE CHANGE ROOMS EXIST, AND CONTAMINATED DIAL HOLDERS ARE PASSED INTO UNRESTRICTED AREAS. AEC INDICATES THAT OTHER PAINTERS WITH CAREFUL HOUSEKEEPING CAN OPERATE WITHIN THEIR LIMITS.

*CONTAMINATION + *FAILURE, ADMINISTRATIVE CONTROL

010561
VAUGH HA
TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966
U. S. RADIUM CORPORATION
1 PAGE, JUNE 2, 1966, ATOMIC ENERGY CLEARING HOUSE, 12(27), PAGE 29 (JULY 4, 1966)

AN INDIVIDUAL BIOASSAY AVERAGED 30 MICROCURIES OF TRITIUM PER LITER FOR 7 DAYS, DUE TO TWO CONTINGENCIES NOT FORESEEN (IMPROPER HANDLING OF LEAKING TRITIUM-FILLED GLASS TUBES, AND BEING TOO CLOSE TO A LEAKING GAS-FILLING PORT).

*PERSONNEL EXPOSURE, RADIATION + *INCIDENT, NONREACTOR + FAILURE, ADMINISTRATIVE CONTROL

010860
MINNICK LE
YANKEE OPERATION REPORT NO. 66, FOR THE MONTH OF JUNE, 1966
YANKEE ATOMIC ELECTRIC COMPANY
11 PAGES, 2 FIGURES, JULY 22, 1966, DOCKET 50-29, PDR

REPORTS IN THIS SERIES WILL BE INDEXED AS PERTINENT ITEMS ARE REPORTED. SIXTY-DAY CONTAINMENT LEAK RATE AVERAGED 0.011 PERCENT PER DAY, AND EXTRAPOLATED TO 0.11 PERCENT PER DAY AT TEST PRESSURES. A PH.D. CANDIDATE TESTED A PORTABLE GAMMA SPECTROMETER IN ENVIRONMENTAL WATERS. NITROGEN BOTTLE INSTALLED FOR ALTERNATE AIR PRESSURE FOR VALVES IN STEAM-DRIVEN EMERGENCY BOILER FEED PUMP. PRIOR TO BORON REMOVAL, IN-CORE INSTRUMENTS EVALUATED FZ EQUAL 2.2, FH EQUAL 1.9, AND MINIMUM DNBR 3.28. FOLLOWING DILUTION, I-131 CONTENT DOUBLED. TRITIUM AVERAGED 2.4 MICROCURIES PER MILLILITER IN PC, AND SOME 435 MC GROSS BETA-GAMMA AND SOME 180 C TRITIUM DISCHARGED FROM WASTE-DISPOSAL SYSTEM.

*REPORT, OPERATIONS + REACTOR, PWR + POISON, SOLUBLE + YANKEE ROWE (PWR) + HOT SPOT

011919
COWPER G + KNIGHT GB + ROWE PC
ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1965

011919 *CONTINUED*
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-2540 +. 16 PAGES, 8 FIGURES, 3 TABLES, FEBRUARY 1966, AECL $0.50 CY

AN ANALYSIS OF OCCUPATIONAL RADIATION EXPOSURES RECEIVED BY WORKERS AT AECL SITES IN 1965 HAS BEEN CARRIED OUT BY MACHINE ACCOUNTING METHODS. RESULTS ARE PRESENTED IN TABLES AND GRAPHS.

*CANADA + DOSE MEASUREMENT, EXTERNAL + *PERSONNEL EXPOSURE, RADIATION

013446
KILLIAN CB
TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
2 PAGES, ATOMIC ENER+Y CLEA-+NG HOUSE 12(50), PAGES 20-21 (DECEMBER 12, 1966)

(1) DURING THREE WEEKS IN EARLY OCTOBER 1966, A TECHNICIAN RECEIVED 0.4 REM INTERNAL EXPOSURE FROM TRITIUM DUE TO INADEQUATE AIR VELOCITY IN HOOD. THE RADIOLOGICAL SAFETY TECHNICIAN WILL NOW MEASURE AIR VELOCITY DURING ANY OPERATIONAL SURVEY. (2) DURING LATE OCTOBER, A JUNIOR CHEMIST RECEIVED AN INTERNAL TRITIUM EXPOSURE DUE TO IMPROPER DECONTAMINATION OF A VACUUM LINE BECAUSE HIS SUPERVISOR FAILED TO REVIEW THE OPERATION.

*PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + FAILURE, ADMINISTRATIVE CONTROL

013458
SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM
SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE
CONF-640413 +. 138 PAGES, TABLES, SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM, LE VESINET, FRANCE, APRIL 16-18, 1964, IN FRENCH

THE 23 PAPERS, TOGETHER WITH THE DISCUSSIONS FOLLOWING THEIR PRESENTATION, PRESENTED AT THE SEMINAR AT LE VESINET ON PROTECTION AGAINST THE DANGERS OF TRITIUM ARE COMPILED.

AVAILABILITY - SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE, FREE.

FISSION PRODUCT RELEASE

014080
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION
NEW ENGLAND NUCLEAR CORPORATION
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(3) PAGES 20-21 (JANUARY 16, 1967)

(LETTER NOVEMBER 22) A CHEMIST RECEIVED 0.46 REM TRITIUM DOSE AFTER THE BREAKING OF A GLASS REACTION VESSEL BY A STIRRING BAR, WHILE INCORPORATING 175 CURIES OF TRITIUM INTO A PLASTIC.

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION

014734
RAY JW + WOOTON RO + BARNES RH
INVESTIGATION OF TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS
BATTELLE MEMORIAL INSTITUTE
BMI-1787 +. 121 PAGES, OCTOBER 31, 1966

THE TERNARY FISSION PROCESS IS THE MAJOR SOURCE OF TRITIUM, FOLLOWING USE OF LITHIUM-BASED RESIN IN 1963 GENERATED AT THE RATE OF 8.7 X 10 TO THE 5TH TRITONS PER FISSION. THE RESULTANT TRITIUM DIFFUSES THROUGH THE CLAD. WATER SAMPLES WERE ASSAYED, AND A MATHEMATICAL MODEL DESCRIBING TRITIUM GENERATION AND MOVEMENT THROUGHOUT PM PLANTS WAS DEVELOPED. THE RESULTING PROGRAM, TRICON, WAS EMPLOYED TO CALCULATE TRITIUM CONCENTRATIONS AT PM-3A DURING 1965. AGREEMENT BETWEEN CALCULATED AND MEASURED CONCENTRATIONS WAS GOOD. POTENTIAL HEALTH HAZARDS FROM BOTH AIRBORNE AND WATERBORNE TRITIUM WERE CALCULATED. THE MOST ECONOMICAL SOLUTION AT PM-1 APPEARS TO BE THE REMOVAL OF TRITIATED EFFLUENT FROM THE PLANT SITE AT $1.40 PER GALLON, AND AT PM-3A TO BE THE EXPELLING OF TRITIATED EFFLUENT WATER TO AN ISOLATED AREA WHERE IT WILL FREEZE AND SUBLIME IN SAFE CONCENTRATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151, $3.00 COPY, $0.65 MICRONEGATIVE

COMPUTER PROGRAM + COMPUTER, DIGITAL + REACTOR, PWR + *WASTE DISPOSAL, LIQUID + HAZARDS ANALYSIS + PM 1 (PWR) + PM 3A (PWR) + *MAIN COOLING SYSTEM + REACTOR, MILITARY

015081
JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967
JOHN HOPKINS UNIVERSITY, BALTIMORE
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGE 34, (MARCH 13, 1967)

JOHNS HOPKINS REPORTS FEB. 21, THAT 10 CURES OF TRITIUM (IN URANIUM HYDRIDE) WERE RELEASED AS A GLASS TUBE BROKE AND THE UH BURNED SPONTANEOUSLY. TWO PERSONS WERE EXPOSED TO 3 MPC AIR, URINE SPECIMENS PEAKED AT 0.1 MPC. VENTILATION SYSTEM SPREAD AIR CONTAMINATION THROUGHOUT BUILDING.

015081 *CONTINUED*
INCIDENT OCCURRED AT 6 PM.

INHALATION + *VENTILATION SYSTEM + *INCIDENT + *PERSONNEL EXPOSURE, RADIATION

015083
TRITIUM EXPOSURE AT US RADIUM CORP., DEC. 13, 1966
U.S. RADIUM CORPORATION
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGES 35-36, (MARCH 13, 1967)

U.S. RADIUM CORP. REPORTS JAN. 24 THAT AN R AND D SCIENTIST BREATHED AIR CONTAINING TRITIUM FROM A LEAKY GLASS TUBE FILL FACILITY. LATE REPORTING IS DUE TO ORIGINAL USE OF SUBMERSIBLE TRITIUM MPC (WHICH INDICATED NO OVEREXPOSURE). IF THE SOLUBLE MPC VALUE IS USED, ASSUMING OXIDATION HAD TAKEN PLACE, AN OVEREXPOSURE OCCURRED. IN ADDITION, AN ION CHAMBER INDICATED 100 TIMES HIGHER THAN AN IMPINGER SAMPLE.

*FAILURE, EQUIPMENT + INHALATION + MPC + *INCIDENT, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION

015084
TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967
U.S. RADIUM CORPORATION
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGE 36, (MARCH 13, 1967)

U.S. RADIUM CORP., JAN. 25, REPORTS THAT A DIAL PAINTER WAS EXPOSED TO 1.46 MPC, DUE TO (1) AN ACCUMULATION OF FRESHLY PAINTED DIALS NEXT TO THE MACHINE, (2) RESIDUAL CONTAMINATION OF SAMPLING-TRAIN COMPONENTS (DRY GAS METER). THE MACHINE IS COMPLETELY ENCLOSED AND KEPT AT MINUS 3 INCHES (WATER) PRESSURE, ALTHOUGH THE AIR FLOW IS BARELY PERCEPTIBLE.

*GLOVE BOX + VENTILATION SYSTEM + INCIDENT + *PERSONNEL EXPOSURE, RADIATION + FAILURE, DESIGN ERROR + FAILURE, ADMINISTRATIVE CONTROL

016929
ELK RIVER REACTOR SYSTEM MONITORING DATA
RURAL COOPERATIVE POWER ASSOCIATION
COO-651-32 +. 61 PAGES, 10 FIGURES, SEPTEMBER 1966

BULK OF REPORT IS DATA ON WATERBORNE AND AIRBORNE ACTIVITY LEVELS IN PLANT LOCATION AND SYSTEMS. TRITIUM REACHES EQUILIBRIUM ABOUT 3 MONTHS AFTER A CYCLE STARTUP, BUT ONLY 1/10TH OF THAT EXPECTED. IODINE IN COOLANT IS RELATED TO CRUD BURSTS, INDICATING THAT CRUD IS A HOLDUP MECHANISM. REACTOR-OFFGAS SYSTEM (SCRUBBER, FILTER, ETC.) WAS TRIED OUT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

REACTOR, BWR + ELK RIVER (BWR) + *REPORT, OPERATIONS ANALYSIS + OFF GAS + *MONITORING SYSTEM, RADIATION + *SURVEILLANCE PROGRAM

017118
JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE
JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(33), PAGE 25 AND 26 (AUGUST 14, 1967)

(LETTER, JUNE 6) INSPECTION AFTER A RELEASE OF 30 CURIES OF TRITIUM INTO AN UNRESTRICTED LAB ON FEBRUARY 20 REVEALED (1) TRITIUM POSSESSED, BUT NO VALID AEC LICENSE, (2,3) SURVEYS FOR AIRBORNE TRITIUM WERE INADEQUATE, (4) TWO INDIVIDUALS WERE EXPOSED TO ABOVE MPC FOR TRITIUM, (5-7) TRITIUM WAS STORED IN AN UNRESTRICTED, UNPOSTED AREA AND RECORDS NOT KEPT, (8) THE EXPOSURE IN ITEM 4 AND THE RELEASE ITSELF WERE NOT REPORTED IN WRITING. THERE APPEARS TO BE A LACK OF CENTRAL CONTROL OF PROCUREMENT AND USE OF BY-PRODUCT MATERIAL, WITH NO ONE ASSIGNED OVERALL RESPONSIBILITY TO ENSURE COMPLIANCE WITH LICENSES.

*AIRBORNE RELEASE + COMPLIANCE + *INCIDENT + RADIATION SAFETY AND CONTROL + FAILURE, ADMINISTRATIVE CONTROL

017335
KNIGHT GB + ADAIR B
ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1966
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-2678 +. 14 PAGES, 9 FIGURES, 2 TABLES, FEBRUARY, 1967

AN ANALYSIS OF OCCUPATIONAL RADIATION EXPOSURES RECEIVED BY WORKERS AT AECL SITES IN 1966 WAS CARRIED OUT BY MACHINE ACCOUNTING METHODS. RESULTS ARE PRESENTED IN TABLES AND GRAPHS.

AVAILABILITY - ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER, ONTARIO, CANADA, $0.50 COPY

CANADA + DOSE + DOSE CALCULATION, INTERNAL + DOSE CALCULATION, EXTERNAL + *PERSONNEL EXPOSURE, RADIATION

021995
BUSH WR
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-2756 + CONF-670218-1 +. 17 PAGES, 6 FIGURES, 4 TABLES, 7 REFERENCES, JULY 1967, PRESENTED AT SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL, ALBUQUERQUE, N. MEX.

THE GROWTH OF THE TRITIUM (HTO) HAZARD IN THE NRU REACTOR BUILDING IS REVIEWED, AND THE METHODS AND EXPOSURE GUIDES INTRODUCED TO KEEP THE HAZARD UNDER CONTROL ARE OUTLINED. HTO INTAKES ARE CLASSIFIED AS REMOVAL, CAUTION, MINOR, OR NEGLIGIBLE, DEPENDING ON THE HTO CONCENTRATION IN URINE. REMOVAL EXPOSURES (20 MICROCURIES/LITER) ARE INVESTIGATED, AND A REPORT OF THE EXPOSURE INCIDENT IS DISTRIBUTED TO ALL BRANCHES. THE AVERAGE HTO DOSE RECEIVED IN 50 REMOVAL EXPOSURES IN 1966 WAS 230 MREM, RECEIVED MOSTLY FROM MINOR AND NEGLIGIBLE EXPOSURES. OUR LARGEST HTO EXPOSURE RESULTED IN A DOSE OF 4700 MREM, AND 19 OTHER SINGLE EXPOSURES HAVE EXCEEDED 500 MREM. MOST OF THESE RESULTED FROM INTAKE OF HTO VAPOUR THROUGH THE UNWETTED SKIN OF MEN WEARING AIR-SUPPLIED MASKS AND COTTON COVERALLS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

ADSORPTION + BIOMEDICAL + CANADA + *DOSE + *REACTOR, HWR + *DOSE CALCULATION, INTERNAL + CHALK RIVER + RADIOBIOLOGY

023868
SELECTED CVTR OPERATING EXPERIENCE
CAROLINAS VIRGINIA NUCLEAR POWER ASSOCIATES, INC., PARR, S. C.
32 PAGES, MONTHLY OPERATING REPORT, OCTOBER 1966

(PG 20) - EVALUATED SENSITIVITY OF VARIOUS AIRBORNE-TRITIUM MONITORING INSTRUMENTS TO MIXTURES OF TRITIUM AND FISSION GASES IN CONTAINMENT FOLLOWING A FUEL FAILURE EARLY IN THE MONTH. XENON READ HIGHER BY A FACTOR OF 10 OVER THE ACTUAL CONCENTRATION. ACTUAL TRITIUM CONCENTRATION OF THE MIXTURE WAS ONLY 1/5TH THAT INDICATED. (PG 26) - ON STARTUP AFTER THE SECOND REFUELING, AFTER 1.5 HR AT 90% POWER, A FUEL FAILURE OCCURRED. TESTS THE REST OF THE MONTH SHOWED THIS WAS IN U-TUBE 83 (CONTAINING HIGH-POWER-DENSITY FUEL), AND THE LEAK REPRESENTED LESS THAN 1% FAILED FUEL, PROBABLY ONE RCD.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

CVTR (PWR) + *FAILURE, FUEL ELEMENT + REACTOR, HWR + REPORT, OPERATIONS + REACTOR, PRESSURE TUBE + REACTOR, PWR + *XENON + *MONITOR, AIR + *INSTRUMENT, ABNORMAL INDICATION

027838
YANKEE OPERATION REPORT 91 - JULY 1968
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASS.
YA-2662 +. 6 PAGES, AUGUST 20, 1968, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

WORK ON THE INCORE FLUX WIRE SYSTEM REQUIRED MORE ENTRY INTO CONTAINMENT. TRITIATED AIR WAS REDUCED FROM .71 TO 0.08 CURIES/CC BY DISPERSING STEAM INTO THE VAPOR CONTAINER. REACTOR SHUTDOWN ONE DAY TO REPLACE A MAIN PC PUMP SEAL. ONSTARTUP A SEVERE WATER HAMMER CAME FROM PARTIAL FLOODING OF A HEATER SHELL (BY DRAWING HOT WATER FROM NO. 1 HEATER THRU A COMMON DRAIN LINE). VAPOR CONTAINER LEAKAGE WAS 0.030%/DAY. FUEL BURNUP WAS 0.152 PPM BORON PER MWD/MTU.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

AIRBORNE RELEASE + CONTAINMENT, HIGH PRESSURE + *FUEL BURNUP + INSTRUMENT, IN CORE + MAINTENANCE AND REPAIR + REPORT, OPERATIONS + REACTOR, PWR + TEST, LEAK RATE + *THERMAL MECHANICAL EFFECT + YANKEE ROWE (PWR)

026087
INTERNAL EXPOSURE OF CHEMIST TO TRITIUM
NEW ENGLAND NUCLEAR CORP., ALBANY ST., BOSTON, MASS.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(25), PAGE 19, (JUNE 17, 1968)

(LETTER, MAY 8) ON APRIL 4, A JUNIOR CHEMIST WAS SYNTHESIZING AN ORGANIC COMPOUND CONTAINING TRITIUM IN A HOOD UNDER VACUUM WITH A GAS CHROMATOGRAPH. HE RECEIVED A CALCULATED INTERNAL WHOLE-BODY EXPOSURE OF 662 MREM FROM TRITIUM AND CARBON-14. EXPOSURE WAS FROM MULTIPLE CAUSES - (1) LOOSENING OF FAN BELTS, (2) PLACING HEAD IN THE HOOD, (3) POSSIBLE FATIGUE OF RUBBER TUBING AND LEAKS. A NEW FACE DESIGN FOR HOOD WILL PREVENT ENTRY OF HEAD. RUBBER TUBING WILL BE CHANGED OFTENER. CHROMATOGRAPH EXIT PORTS WILL BE DIRECTED TO THE SIDE OF HOOD RATHER THAN TO PORT.

GLOVE BOX + FAILURE, OPERATOR ERROR + *INHALATION + *VENTILATION SYSTEM + *PERSONNEL EXPOSURE, RADIATION + *RADIOISOTOPE

027860
BUSH WR
ANALYSIS OF RADIATION EXPOSURES IN 1967
ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER, ONTARIO
AECL-3063 +. 16 PAGES, 8 FIGURES, 2 TABLES, MARCH, 1968

027860 *CONTINUED*
EXPOSURES TO EXTERNAL BETA AND GAMMA RADIATION AND TO INTERNAL RADIATION FROM TRITIATED WATER (HTO) ARE ANALYSED AND COMPARED WITH EXPOSURES IN PREVIOUS YEARS. THE TOTAL, AVERAGE, AND HIGHEST EXPOSURES RECEIVED AT AECL SITES IN 1967 ARE GIVEN. ABOUT 85% OF THE EXTERNAL AND 100% OF THE INTERNAL EXPOSURE WAS RECEIVED AT CRNL, OF WHICH NEARLY 10% WAS RECEIVED BY OPERATING, MAINTENANCE AND RADIATION CONTROL PERSONNEL, MOSTLY IN THE NRX AND NRU REACTOR BUILDINGS. THE COMBINED DOSES FROM EXTERNAL AND INTERNAL EXPOSURES TO THE WHOLE BODY, EYE LENSES, AND SKIN, AND THEIR DISTRIBUTION AMONG BRANCHES AND INDIVIDUALS, ARE PRESENTED IN GRAPHICAL FORM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*DOSIMETRY + MONITOR, PERSONNEL + GROSS BETA + GROSS GAMMA + CHALK RIVER + *RADIATION SAFETY AND CONTROL + *CONCENTRATION + MAN

027977
COOLEY RC
CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS
SAVANNAH RIVER LABORATORY
DPSPU-66-30-13 + CONF-680607-1 +. 15 PAGES, TABLES, MAY 1968, FROM 13TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO

IN HEAVY-WATER-MODERATED REACTORS, TRITIUM IS FORMED AS NEUTRONS ARE ABSORBED BY THE HEAVY WATER. HAZARDS FROM TRITIUM RELEASED TO PERSONNEL ZONES DURING REPAIR AND MAINTENANCE OPERATIONS ARE MINIMIZED BY PROPER JOB EVALUATION AND SELECTION OF CORRECT PROTECTIVE EQUIPMENT. AT SAVANNAH RIVER PLANT, BASIC INFORMATION HAS BEEN DEVELOPED TO FACILITATE THIS PROCESS. DATA IS GIVEN RELATIVE TO BUILDUP OF TRITIUM IN MODERATOR, AIRBORNE CONCENTRATION OF TRITIUM, CONCENTRATION OF TRITIUM IN SPILLED MODERATOR AND WATER, ASSIMILATION OF TRITIUM BY PERSONNEL THROUGH INHALATION AND BODY CONTACT, AND DOSE RECEIVED BY URINE ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*REACTOR, HWR + INHALATION + *ANALYTICAL TECHNIQUE + HAZARDS ANALYSIS + RADIATION SAFETY AND CONTROL + SORPTION + *MONITORING SYSTEM, RADIATION + CONCENTRATION + EXCRETION, URINE + MAN

030208
SELECTED HADDAM NECK OPERATING EXPERIENCE
CONNECTICUT YANKEE ATOMIC POWER COMPANY
NYO-3250-29 +. 20 PAGES, FIGURES, TABLES, OPERATING REPORT NO. 68-11, DECEMBER 20, 1968, DOCKET 50-213, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

NOS. 1 AND 4 STEAM GENERATORS CANNOT BE OPERATED AT DESIGN LEVEL WITHOUT CARRYOVER. ***THE REACTOR SCRAMMED 18 NOV. FOR NO KNOWN CAUSE, THE TURBINE INDICATING A REACTOR TRIP AND THE REACTOR INDICATING A TURBINE TRIP. ON RESTART, TURBINE LOADING BECAME ERRATIC (EXCEEDING 100 MWE IN SECONDS) DUE TO METAL FILINGS BINDING THE FEEDBACK SLEEVE OF THE PILOT VALVE. NO REASON HAS BEEN FOUND FOR THE SCRAM. ***INJECTION OF 18 GPH STEAM INTO CONTAINMENT REDUCED TRITIUM CONCENTRATION BY A FACTOR OF 6.1 AND 25 GPH REDUCED BY 8. TRITIUM LEVEL ROSE IMMEDIATELY ON STOPPING STEAM, EITHER DUE TO POOR MIXING OR INSUFFICIENT TIME (45 HR) FOR NEW EQUILIBRIUM LEVEL TO BE REACHED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*AIRBORNE RELEASE + ACCIDENT, COLD COOLANT + FAILURE, COMPONENT + CONTAINMENT, HIGH PRESSURE + REPORT, OPERATIONS + REACTOR, PWR + STEAM + *CONNECTICUT YANKEE (PWR) + INSTRUMENT, LIQUID LEVEL + *SCRAM, SPURIOUS + FLOW BLOCKAGE + INSTRUMENT, ABNORMAL INDICATION + STEAM GENERATOR + TURBINE + PARTITION COEFFICIENT + VALVES

030778
WASCHER RE + HOWARD JO
RADIATION CONSIDERATIONS IN NUCLEAR POWER PLANTS
BABCOCK AND WILCOX, LYNCHBURG, VIRGINIA
TRG-68-80 +. OCTOBER 21, 1968, P. 46

IDENTIFIES MAJOR SOURCE OF RADIOACTIVITY AND RESULTANT DESIGN AND OPERATING PROBLEMS. (SOURCES) ARGON-41, CORROSION AND FISSION PRODUCTS, TRITIUM. (PROBLEMS) ACCESSIBILITY FOR MAINTENANCE BECAUSE INDIAN POINT 1 STEAM GENERATORS WERE 6 REMS/HR AT 700 EFP DAYS, IN-CORE INSTRUMENT REMOVAL REQUIRES SPECIAL SHIELDING. TRITIUM AND KRYPTON DURING REFUELING REQUIRE AIR PURGE.

AVAILABILITY - ROBERT E. WASCHER AND/OR JAMES O. HOWARD, BABCOCK AND WILCOX, LYNCHBURG, VIRGINIA

FISSION GAS RELEASE + MAINTENANCE AND REPAIR + REACTOR, POWER + *RADIATION SAFETY AND CONTROL

031445
PEROTIN JP + BAL G
DETECTION OF ATMOSPHERIC CONTAMINATION IN LABORATORIES OF HIGH ACTIVITY
CEN, SACLAY, FRANCE
CONF-651220 +. 5 PAGES, PAGES 60-4 OF CONGRES INTERNATIONAL SUR LA RADIPPROTECTION DANS 1 UTILISATION INDUSTRIELLE DES RADIOELEMENTS, PARIS, 13-15, DECEMBER 1965. PARIS, SERVICE CENTRA DE PROTECTION CONTRE LES

031445 *CONTINUED*
RAYCNNEMENTS IONISANTS, 1967

THE DIFFERENT TYPES OF ATMOSPHERIC CONTAMINATION RECORDED AT THE RADIATION CONTROL DESK OF THE HIGH-ACTIVITY LABORATORY OF THE SACLAY CENTER OF NUCLEAR STUDIES ARE GROUPED AND CLASSIFIED. THE RECORDS FROM IONIZATION CHAMBERS USED AS RADIOACTIVE AEROSOL DETECTORS ARE DISCUSSED ACCORDING TO THE EFFECT OF VENTILATION OF THE LABORATORY ON ATMOSPHERIC CONTAMINATION.

*ACCIDENT + *CHAMBER, ION + FRANCE + KRYPTON + *MONITOR, PERSONNEL + PLUTONIUM + *ATMOSPHERIC POLLUTION + POLONIUM + MONITOR, ENVIRONMENTAL + *AEROSOL, RADIOACTIVE + *HIGH RADIATION + *CONTAMINATION + RADIATION SAFETY AND CONTROL

033070
NELLIS DO + HUDSPETH EL + MORGAN IL + BUCHANAN PS + BOGGS RF
TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION
U. S. DEPT. OF HEALTH, EDUCATION, AND WELFARE
U. S. PUBLIC HEALTH SERVICE PUBLICATION NO. 999-RH-29 +. 47 PAGES, 15 FIGURES, 5 TABLES, AND 8 REFERENCES, FEB. 1969

TRITIUM-METALLIC TARGETS ARE FREQUENTLY USED IN MANY PARTICLE ACCELERATORS FOR THE PRODUCTION OF HIGH-ENERGY NEUTRONS. THE PURPOSE OF THIS STUDY WAS TO INVESTIGATE THE PROBLEMS AND HAZARDS ASSOCIATED WITH THE USE OF THESE TRITIUM TARGETS SO THAT APPROPRIATE STEPS CAN BE TAKEN TO MINIMIZE THE POTENTIAL RADIOLOGICAL HEALTH HAZARDS. THIS STUDY SHOWED THAT BOMBARDMENT OF TRITIUM TARGETS RESULTS IN THE LOSS OF ABOUT 1 TRITIUM ATOM FOR EACH BOMBARDING DEUTERON, AND THAT MOST OF THE TRITIUM IS IN A GASEOUS FORM WHEN IT LEAVES THE TARGET. IT WAS DETERMINED THAT A SMALL AMOUNT OF TRITIUM RELEASED FROM TARGET ACTUALLY REMAINS WITHIN THE ACCELERATOR ITSELF. MOST OF THE TRITIUM LOST BY A BOMBARDED TARGET IS TRAPPED IN THE ELEMENTS OF AN ION PUMP OR RELEASED THROUGH THE VACUUM SYSTEM EXHAUST.

AVAILABILITY - U. S. DEPT. OF HEALTH EDUCATION AND WELFARE, CONSUMER PROTECTION AND ENVIRONMENTAL HEALTH SERVICE, ENVIRONMENTAL CONTROL ADMINISTRATION

*HAZARD, RELATIVE + *VACUUM RELIEF + CONTAMINATION + RADIOACTIVITY RELEASE + *NEUTRON + *ACCELERATOR + ENERGY LEVEL + *GAS + HIGH

033310
KATOH J + CHUCHI M
MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE OF POLYMERIC FILMS
JAPAN ATOMIC ENERGY RESEARCH INST., TOKYO
7 PAGES, HOKEN BUTSURI, 3, PAGES 288-294 (JUNE 1968) (IN JAPANESE)

IN HANDLING RADIOACTIVE MATERIALS, VARIOUS KINDS OF PROTECTIVE CLOTHING MADE OF POLYMERIC FILMS ARE USED FOR PROTECTION. THE PERMEATION RATE OF TRITIATED HEAVY WATER AND ITS VAPOR THROUGH POLYMERIC FILM, SUCH AS PVC, POLYETHYLENE, AND RUBBER WAS MEASURED BY USING AN IONIZATION CHAMBER WITH A VIBRATING REED ELECTROMETER. ON THE BASIS OF THE RESULTS OBTAINED, INTERNAL EXPOSURE OF THE PERSON WEARING THE PROTECTIVE CLOTHING IS EVALUATED AND DISCUSSED.

CHAMBER, ION + *HEAVY WATER + *MEASUREMENT + *PERSONNEL PROTECTIVE DEVICE + *CONTAMINATION + MATERIAL + PERSONNEL EXPOSURE, RADIATION + RADIOISOTOPE + *FILM + *SAFETY EVALUATION + *PLASTICS

036295
SELECTED HADDAM NECK OPERATING EXPERIENCE
CONNECTICUT YANKEE ATOMIC POWER COMPANY
NYO-3250-23 +. 11 PAGES, HADDAM NECK OPERATION REPORT NO. 68-6, JULY 12, 1968, DOCKET 50-312, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

DNB RATIOS RECALCULATED FOR OCT. 1967-MARCH 1968. BASED ON CORRECT MEASUREMENTS, MINIMUM WAS 4.13 (NORMAL) AND 1.68 (ROD EJECTION). TRITIUM RELEASE WAS 137 CURIES. CORE REACTIVITY DEPLETION IS APPROCHING THE DESIGN CURVE, AND A MEMO OUTLINED REACTIVITY (BORON) CHANGES FOR ALL NORMAL OPERATIONS. STEAM-GENERATOR LEVEL INSTRUMENTATION SENSITIVITY DECREASED, INDICATING CRUD BUILDUP IN THE UPPER LEVEL TOPS, REQUIRING BLOWDOWN AND FUTURE MODIFICATION. LOOP-1 FLOW TRANSMITTER FAILURE CAUSED TRIP, AND TRANSMITTER WAS PLACED OUTSIDE SHIELDING FOR OPERATION AT REDUCED POWER. PINHOLE LEAK REPAIRED ON FEEDWATER CHECK VALVE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

REACTIVITY, EXCESS + *FUEL BURNUP + REACTOR, PWR + CONNECTICUT YANKEE (PWR) + WASTE DISPOSAL, LIQUID + FAILURE, INSTRUMENT + INSTRUMENT, FLOW + INSTRUMENT, LIQUID LEVEL + DNB + *INSTRUMENT, ABNORMAL INDICATION + MAIN COOLING SYSTEM + STEAM GENERATOR

037466
RAY JW
TRITIUM IN POWER REACTORS
BATTELLE MEMORIAL INSTITUTE, COLUMBUS LABORATORIES
8 PAGES, 3 FIGURES, 17 REFERENCES, REACTOR AND FUEL-PROCESSING TECHNOLOGY, 12(1), PAGES 19-26 (WINTER 1968-1969)

037466 *CONTINUED*
DISCUSSES HEALTH PHYSICS ASPECTS, PRODUCTION RATES IN POWER REACTORS, MIGRATION OF TRITIUM, AFFINITY FOR WATER, MIGRATION FROM FUEL PINS, CONTROL AND DISPOSAL. FOR A TYPICAL 1000-MW(E) REACTOR, 40 CURIES/DAY IS PRODUCED BY FISSION. FOR 1000-MW(E) PWR WITH BORON CHEMICAL SHIM, ADDITIONAL TRITIUM IS GENERATED AS A RESULT OF NEUTRON CAPTURE BY BORON. THE PRODUCTION GRADUALLY INCREASES UNTIL 16 CURIES/DAY IS PRODUCED AFTER 365 DAYS OF OPERATION.

*ACTIVITY BUILDUP + FISSION PRODUCT, VOLATILE + INGESTION + INHALATION + *WASTE DISPOSAL + REACTOR, POWER + REACTOR COOLANT + COOLANT CHEMISTRY + PERSONNEL EXPOSURE, RADIATION + CHEMICAL SHIM + MAIN COOLING SYSTEM + RADIATION EFFECT

037933
PEURA EW
TECHNICAL EVALUATION OF PM-1 NUCLEAR POWER PLANT
ENGINEERING DIVISION, U.S. ARMY ENGINEER REACTORS GROUP, CORPS OF ENGINEERS, FORT BELVOIR, VIRGINIA 22060
AD-686341 +. 85 PAGES, 93 REFERENCES, DECEMBER 1968

TECHNICAL EVALUATION OF PM-1 NUCLEAR POWER PLANT. DESIGN OBJECTIVES AND REQUIREMENT ARE EVALUATED. STATE-OF-THE-ART ADVANCES ARE DISCUSSED. RECOMMENDATIONS FOR FUTURE WORK ARE TABULATED. MAINTENANCE WORK WAS DIFFICULT BECAUSE OF COMPACTNESS OF COMPONENTS. TRITIUM PROBLEM DEVELOPED AT BOTH PM-1 AND PM-3A. HYDROGEN GENERATION AT PM-3A (MC MURDOCK BASE) BECAME A PROBLEM.

AVAILABILITY - EDWIN W. A. PEURA, ENGINEERING DIVISION, U.S. ARMY ENGINEER REACTORS GROUP, CORPS OF ENGINEERS, FT. BELVOIR, VIRGINIA 22060

HYDROGEN + REACTOR, PWR + *WASTE DISPOSAL + *PM 1 (PWR) + PM 3A (PWR) + *REACTOR, MILITARY

038081
LACBWR PROVISION OPERATING AUTHORIZATION DPRA-5. CAVITY MONITORING AND LEAK DETECTION
ALLIS-CHALMERS
8 PAGES, LETTER TO P.A. MORRIS, DRL, OCTOBER 2, 1969, DOCKET 115-5, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

AIR-ACTIVITY MONITORS SET UP IN REACTOR CONTAINMENT HOUSING REACTOR VESSEL AND PART OF PRIMARY STEAM AND WATER PIPING IN MARCH 1969. AIR-GRAB SAMPLES FROM CONTAINMENT CONTAIN CESIUM-138 AND NITROGEN-13. LEAKAGE FROM THE DETERIORATING MAIN STEAM ROTOVALVE PACKING RESULTS IN TRITIUM ACTIVITY 3 X 10-2 MICROCURIES PER ML. LEAKAGE RATE NOT SUFFICIENT TO CREATE A SAFETY OR RADIATION HAZARD. MORE DETAILED CHECKS PLANNED FOR OCTOBER-NOVEMBER MAINTENANCE OUTAGE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*ACTIVITY BUILDUP + REACTOR, BWR + CESIUM + *MONITOR, AIR + NITROGEN + RADIOACTIVITY RELEASE + *LACROSSE (BWR) + SURVEILLANCE PROGRAM

038121
OPERATIONS REPORT FOR AUGUST 1969
SAXTON NUCLEAR EXPERIMENTAL CORPORATION
SNEC REPORT, 7 PAGES, AUGUST 1969

A LEAK IN TELEFLEX THIMBLE PORT WAS SEALED OFF WITH A CONOSEAL AND CAP FOR ZERO POWER OPERATION. A REDESIGNED CONOSEAL GASKET WILL BE FABRICATED BEFORE POWER OPERATION IS RESTORED. A HOT LEAK TEST WAS PERFORMED ON THE REPAIRED INSTRUMENT PART. TWENTY-TWO WESTINGHOUSE REACTOR OPERATOR TRAINEES WERE EXAMINED. 0.129 CURIE OF TRITIUM RELEASED DURING MONTH. NO SIGNIFICANT RADIATION EXPOSURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*REPORT, OPERATIONS + REACTOR, PWR + *SAXTON (PWR) + *TRAINING + *EXAMINATION + SEAL

038276
OPERATION REPORT NO. 69-2 FOR THE MONTH OF FEBRUARY 1969
CONNECTICUT YANKEE ATOMIC POWER COMPANY
NYO 3250-32 +. 16 PAGES, OPERATION REPORT NO. 69-2, FEBRUARY 1969. DOCKET 50-213, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

ENVIRONMENTAL RELEASES - (1) GASEOUS, NONE, (2) LIQUID, 53,195 GAL (15.82 MICROCURIES BETA-GAMMA EMITTERS, 160-38 CURIES TRITIUM).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

FISSION PRODUCT RELEASE + *REPORT, OPERATIONS + REACTOR, PWR + *CONNECTICUT YANKEE (PWR) + BETA EMITTER + GAMMA EMITTER + *OPERATING EXPERIENCE

038740
SAN ONOFRE NUCLEAR GENERATING STATION OPERATION REPORT FOR THE MONTH OF JUNE 1969
SOUTHERN CALIFORNIA EDISON COMPANY
NYO-3270-27 +. 8 PAGES, JUNE 1969

OPERATION WAS ROUTINE DURING THE MONTH. MAXIMUM PERSONNEL EXPOSURE WAS 40 MREM. 56 CURIES OF AIRBORNE ACTIVITY WAS RELEASED WITH THE GASEOUS WASTE. 0.07 CURIE OF ACITIVITY WAS RELEASED WITH LIQUID WASTE IN FORM OF TRITIUM.

AIRBORNE RELEASE + REACTOR, PWR + TRAINING + *SAN ONOFRE 1 (PWR) + PERSONNEL EXPOSURE, RADIATION + RADIOACTIVITY RELEASE + *REPORT, OPERATIONS SUMMARY

038741
INDIAN POINT SEMI-ANNUAL OPERATIONS REPORT FOR 8-1-65 TO 1-31-66
CONSOLIDATED EDISON COMPANY OF NEW YORK
29 PAGES, SEMI ANNUAL OPERATIONS REPORT NO. 7, MARCH 18, 1966, DOCKET 50-3, TYPE--PWR, MFG--B+W, AE--CON ED

A STRETCH-OUT PROGRAM ACCOMPLISHED BY GRADUAL REDUCING OF REACTOR POWER LEVEL AND PRIMARY COOLANT TEMPERATURE EXTENDED THE CORE LIFE BY OVER 7 PERCENT. AT END OF STRETCH-OUT, REACTOR POWER WAS 64 PERCENT OF NORMAL FULL POWER. THE LATCHING MECHANISM OF REMOTE-HANDLING-TOOL GRAPPLE DROPPED ONE CONTROL ROD BECAUSE OF MINOR DIMENSIONAL DETAIL OF PICKUP HEAD. GRAPPLE WILL BE MODIFIED. DURING OUTAGE FOR REFUELLING, ALL CONTROL ROD DRIVE MECHANISMS WERE DISASSEMBLED AND OVERHAULED. 258 CURIES OF TRITIUM RELEASED TO HUDSON RIVER.

*INDIAN POINT 1 (PWR) + REACTOR, PWR + REACTOR, POWER + WASTE DISPOSAL, RIVER + TEMPERATURE REACTIVITY EFFECT + RADIOACTIVITY RELEASE + *FAILURE, DESIGN ERROR + REMOTE MANIPULATING AND VIEWING + REPORT, OPERATIONS SUMMARY + CONTROL RODS

039045
HADDAM NECK MONTHLY OPERATION REPORT FOR SEPTEMBER 1969
CONNECTICUT YANKEE ATOMIC POWER COMPANY
NYO-3250-40 +. 11 PAGES, 1 FIGURE, OPERATION REPORT NO. 69-9, OCTOBER 13, 1969, DOCKET 50-213, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

NUMBERS 4 AND 5 CONTROL RODS SLIPPED IN 67 STEPS ON SEPT. 7TH BUT INVESTIGATION AND EXERCISING ROD DID NOT DETECT ANY MALFUNCTION. STUDY OF BORON CONCENTRATION OF 360 PPM AT END OF MONTH AND BORON BURNUP RATE IMPLIES 3.5 FULL POWER MONTHS OF CORE LIFE REMAINING (FINAL - 15,000 MWD/MTU). 360 CURIES TRITIUM RELEASED, 116 MILLICURIES GASEOUS WASTE RELEASED. NET PLANT EFFICIENCY 31 PERCENT FOR MONTH. REACTOR PLANT AVAILABILITY 98.7 PERCENT. FIVE LEAKY TUBES IN 18 FEEDWATER HEATER WERE PLUGGED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*AIRBORNE RELEASE + BORON + REACTOR, PWR + WASTE DISPOSAL, ATMOSPHERIC + *CONNECTICUT YANKEE (PWR) + *WASTE DISPOSAL, LIQUID + *FAILURE, SCRAM MECHANISM + FAILURE, TUBING + CONTROL RODS + HEAT EXCHANGERS

039078
SELECTED ITEMS OF INTEREST
YANKEE ATOMIC ELECTRIC COMPANY
9 PAGES, YANKEE OPERATION REPORT NO. 102 FOR JULY 1969, AUGUST 18, 1969, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

A SODIUM TRACER WAS USED TO RECHECK LEAK RATE FROM PRIMARY TO SECONDARY. LEAK RATE ON NO.1 STEAM GENERATOR IS 3.3 GAL/DAY. COMBINED RATE FOR STEAM GENERATORS 2 AND 3 IS LESS THAN 1 GAL/DAY. A PLANT SHUTDOWN OCCURRED AS RESULT OF ELECTRICAL CONDITIONS CAUSED BY A POSITIVE GROUND ON THE NO. 1 BATTERY SYSTEM. THE MAIN COOLANT TRITIUM CONCENTRATION AVERAGED 0.364 MICROCURIE/ML. 0.45 MILLICURIE OF TRITIUM AS A VAPOR WERE RELEASED THROUGH STACK.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

ACTIVITY BUILDUP + AIRBORNE RELEASE + REPORT, OPERATIONS + REACTOR, PWR + SCRAM, REAL + *YANKEE ROWE (PWR) + STACK + FAILURE, INSTRUMENT + MAIN COOLING SYSTEM + *STEAM GENERATOR + ELECTRICAL CONDUCTION + *LEAK + BATTERIES & CHARGERS

039079
SELECTED ITEMS OF INTEREST
YANKEE ATOMIC ELECTRIC COMPANY
14 PAGES, YANKEE OPERATION REPORT NO. 104 FOR AUGUST 1969, SEPTEMBER 23, 1969, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

REACTOR WAS SHUTDOWN AUG. 2 FOR REFUELING AND MAINTENANCE. BEFORE SHUTDOWN, COOLANT TRITIUM CONCENTRATION WAS 0.303 MICROCURIE/ML. REPAIR OF PRIMARY TO SECONDARY LEAK IN STEAM GENERATOR NO. 4 WAS INITIATED. DOSE RATES WERE 5 TO 6 R/HR INSIDE WATER BOXES. ONE INDIVIDUAL RECEIVED EXPOSURE DOSE OF 2.5 REMS DUE TO INADEQUATE HEALTH PHYSICS COVERAGE AND FAILURE OF INDIVIDUAL TO READ DOSIMETER EACH TIME HE EXITED AND REENTERED AREA. CRANE OPERATOR MISPOSITIONED SPENT FUEL ASSEMBLY AND DAMAGED ASSEMBLY AND REFUELING EQUIPMENT

039079 *CONTINUED*
AVAILABILITY - . CFS

ACTIVITY BUILDUP + FUEL HANDLING + *FAILURE, OPERATOR ERROR + *REPORT, OPERATIONS + REACTOR, PWR + YANKEE ROWE (PWR) + *PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + *REFUELING + *INCIDENT, HUMAN ERROR + *FUEL HANDLING MACHINE + *DAMAGE + MAIN COOLING SYSTEM + STEAM GENERATOR + LEAK + *OPERATING EXPERIENCE + FUEL ELEMENTS

039080
SELECTED ITEMS OF INTEREST
YANKEE ATOMIC ELECTRIC COMPANY
11 PAGES, YANKEE OERATION REPORT NO. 105 FOR SEPTEMBER 1969, OCTOBER 22, 1969, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

CORE 7-8 REFUELING CONTINUED. CORE 8 CRITICAL REACHED SEPT. 17. DURING PHYSICS TESTING PERIOD, LEAK DEVELOPED ON WELD IN BLOWDOWN LINE OF NO. 4 STEAM GENERATOR AND THE PRESSURIZER LOW SET SAFETY VALVE WAS LEAKING. OUTAGE TIME FOR CORE 7-8 REFUELING WAS 54 DAYS. WASTE DISPOSAL, LIQUID RELEASES CONTAINED 30.44 CURIES OF TRITIUM, SECONDARY PLANT WATER DISCUARGED CONTAINED 0.71 CURIES, AND 1.39 CURIES WAS DISCHARGED VIA STACK.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REPORT, OPERATIONS + REACTOR, PWR + YANKEE ROWE (PWR) + STACK + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + PRESSURE RELIEF + REFUELING + LEAK + OPERATING EXPERIENCE + VALVES + PIPES AND PIPE FITTINGS

039217
OPERATION REPORT 69-10 FOR THE MONTH OF OCTOBER 1969
CONNECTICUT YANKEE ATOMIC POWER COMPANY
NYO-3250-41 +. 14 PAGES, OPERATION REPORT NO. 69-10, OCTOBER 1969, DOCKET 50-213, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

DURING OCTOBER 1969, RELEASED 26.395 MILLICURIES BETA-GAMMA AND 0.003 CURIE TRITIUM (AS GASES - 17,290 CU FT) PLUS 2.81 MILLICURIES BETA-GAMMA AND 949.2 CURIES TRITIUM (AS LIQUIDS - 167,300 GAL).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*FISSION PRODUCT RELEASE + *REPORT, OPERATIONS + REACTOR, PWR + *CONNECTICUT YANKEE (PWR) + BETA EMITTER + GAMMA EMITTER + *OPERATING EXPERIENCE

039230
SELECTED OPERATING EXPERIENCES
YANKEE ATOMIC ENERGY COMPANY, MASSACHUSETTS
8 PAGES, YANKEE OPERATION REPORT NO. 74 FOR MONTH OF FEBRUARY 1967, MARCH 17, 1967, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

NO SHUTDOWNS OR SCRAMS OCCURRED DURING THE MONTH. CORE REACTIVITY DEPLETION WAS NORMAL AT 0.63 PERCENT DELTA K/K PER 1000 MWT D/MTM. THE PRIMARY-TO-SECONDARY LEAK RATE IN NO. 3 STEAM GENERATOR SLOWLY INCREASED FROM 142 GPD TO 404. WASTE-DISPOSAL LIQUID RELEASES TOTALED 265,800 GAL CONTAINING 19.46 MILLICURIES OF GROSS BETA-GAMMA AND 65.10 CURIES OF TRITIUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

FUEL BURNUP + *REPORT, OPERATIONS + REACTOR, PWR + YANKEE ROWE (PWR) + WASTE DISPOSAL, LIQUID + RADIOACTIVITY RELEASE + STEAM GENERATOR + LEAK

039231
OPERATION REPORT NO. 69-5 FOR THE MONTH OF MAY 1969
CONNECTICUT YANKEE ATOMIC POWER COMPANY
NYO-3250-35 +. 15 PAGES, OPERATION REPORT NO. 69-5, MAY 1969, DOCKET 50-213, TYPE--PRW, MFG--WEST., AE--STONE + WEBSTER

(1) AT 1015 HR ON MAY 3, BECAUSE OF OVERPRESSURIZATION DUE TO IMPROPER LINEUP OF VALVES, TANK 1A (BORON RECOVERY DISTILLATE) CRACKED AT THE DISKED HEAD SEAM RELEASING ABOUT 200 GAL OF RADIOACTIVE DISTILLATE TO AN ASPHALTED AREA (50 MICROCURIES OF BETA-GAMMA EMITTERS AND 1.74 CURIES OF TRITIUM). FLUSHED AREA WITH 20,000 GAL WATER TO DILUTE THE SPILL. (2) BETWEEN 1500-1700 HR ON MAY 6, DISCHARGED ABOUT 500 GAL OF RADIOACTIVE H3BO3 SOLUTION TO THE FLOOR OF THE BORON-RECOVERY AREA. ISOLATED THE AREA (RADIOACTIVITY LEVEL BELOW MPC), THEN CLEANED IT UP. VERY LITTLE RADIOACTIVE LIQUID OR VAPOR HAD BEEN RELEASED TO THE ATMOSPHERE

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*FISSION PRODUCT RELEASE + REPORT, OPERATIONS + REACTOR, PWR + CONNECTICUT YANKEE (PWR) + BETA EMITTER + CONTAMINATION + INCIDENT, EQUIPMENT + *INCIDENT, HUMAN ERROR + GAMMA EMITTER + OPERATING EXPERIENCE

040005
HBWR QUARTERLY PROGRESS REPORT, APRIL-JUNE 1969
INSTITUTT FOR ATOMENERGI, HALDEN, NORWAY
HPR-112 +. 123 PAGES, 41 FIGURES, 16 TABLES, 5 REFERENCES, AUGUST 1969

THREE SCRAMS OCCURRED BECAUSE OF (1) OPERATOR ERROR, (2) ELECTRICAL FAULT IN INSTRUMENT, AND (3) ROD DROP. A D2O LEAK FROM THE REACTOR IS DISCUSSED IN LENGTH IN WHICH FISSION GASES WERE RELEASED TO THE REACTOR HALL. ONE PERSON HAD A TRITIUM INTAKE OF 2000 MICROCURIES, WITH AN ESTIMATED DOSE OF 500 MILLIREMS. SUMMARIZES RESEARCH ON COMPUTER CONTROL OF REACTOR, AND IRRADIATION TESTING OF FUEL ASSEMBLIES.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

REACTOR, BWR + FUEL BURNUP + HEAVY WATER + REACTOR, HWR + FAILURE, OPERATOR ERROR + REPORT, OPERATIONS + *SCRAM, REAL + FAILURE, INSTRUMENT + NORWAY + IRRADIATION TESTING + RADIOACTIVITY RELEASE + MAIN COOLING SYSTEM + COMPUTER CONTROL + *LEAK + OPERATING EXPERIENCE

040046
TSAI CM + WENG PS
A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT
NATIONAL TSING HUA UNIVERSITY, HSINCHU, TAIWAN
9 PAGES, 11 REFERENCES, HO TSU K-C HSUEH, VOL. 6, PAGES 51-9 (OCTOBER 1968) (IN CHINESE)

TRITIUM AND OTHER RADIOACTIVE NUCLIDES HAVE BEEN INDUCED IN THE TSING HUA OPEN-POOL REACTOR (THOR) COOLANT BY THE EXPOSURE OF MINUTE AMOUNTS OF DEUTERIUM AND IMPURITIES EXISTING IN THE COOLANT WATER TO THE NEUTRONS AFTER SOME 6,000,000 KWH OPERATION. A MIXED BED RESIN WAS TRACED BY THE TRITIUM AND THE FISSION PRODUCT STANDARD SOURCES AND THEN PASSED THROUGH BY THE COOLANT SAMPLE OF WHICH 3 MILLILITERS WERE DISSOLVED IN THE LIQUID SCINTILLATOR. WITH AN AID OF A L IQUID SCINTILLATION COUNTER THE TRITIUM CONTENT WAS FOUND TO BE 5740 +- 2.1 PERCENT T.U. THE REACTOR POWER OUTPUT CAN BE ESTIMATED FROM THE TRITIUM ACTIVITY, PARTICULARLY UNDER LONG TIME AND HIGH POWER OPERATION.

*COUNTER + DEUTERIUM + *SAMPLING + *COOLANT CHEMISTRY + RESIN

040701
HADDAM NECK PLANT OPERATION REPORT FOR MONTH OF DEC. 1969
CONNECTICUT YANKEE ATOMIC POWER COMPANY
12 PAGES, OPERATION REPORT NO. 69-12, DECEMBER 1969, DOCKET 50-213, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

PLANT WAS OPERATED BASE-LOADED AT POWER LEVELS BETWEEN 499 AND 600 MWE EXCEPT FOR A DECREASE TO 320 MWE FOR WORK ON TRANSMISSION LINE. AUTOMATICALLY REDUCED TO 470 MWE BECAUSE OF MALFUNCTION IN CIRCUITRY OF POWER RANGE CHANNEL AND ALSO REDUCED TO 400 MWE FOR TURBINE VALVE TESTS. NO PLANT SHUTDOWNS. NO ABNORMAL OCCURRENCES. 169,000 GAL OF LIQUID WASTE CONTAINING 730 CURIES TRITIUM RELEASED TO ENVIRONS. 5 CURIES OF GASEOUS WASTE RELEASED IN 3000 FT3. MAXIMUM PERSONNEL EXOSURE WAS 394 MREM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*REPORT, OPERATIONS + REACTOR, PWR + *CONNECTICUT YANKEE (PWR) + BETA EMITTER + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + *PERSONNEL EXPOSURE, RADIATION + GAMMA

041165
YANKEE NUCLEAR POWER STATION OPERATING REPORT FOR DECEMBER 1969
YANKEE ATOMIC ELECTRIC COMPANY
10 PAGES, YANKEE OPERATION REPORT NO. 108, DECEMBER 1969, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

LEAKAGE FROM PRIMARY TO SECONDARY SYSTEM IN NO. 1 STEAM GENERATOR INCREASED TO 125 GAL/DAY. REACTOR POWER WAS REDUCED FOR TURBINE THROTTLE VALVE TEST. 86 CURIES OF TRITIUM WERE RELEASED WITH THE LIQUID WASTE. LESS THAN 2 MILLICURIES OF TRITIUM WERE RELEASED WITH THE GASEOUS WASTE. PLANT OPERATED NEARLY 98 PERCENT OF THE TIME

FAILURE, EQUIPMENT + *REPORT, OPERATIONS + REACTOR, PWR + *YANKEE ROWE (PWR) + STEAM GENERATOR + *LEAK

041923
SELECTED OPERATING EXPERIENCE
YANKEE ATOMIC ELECTRIC COMPANY
10 PAGES, YANKEE OPERATION REPORT NO. 61, FEBRUARY 23, 1966, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

ONE OF A SERIES OF REPORTS. TOPICS - SUMMARY, CHEMISTRY REACTOR PLANT PERFORMANCE TURBINE PLANT PERFORMANCE, INSTRUMENT AND CONTROL HEALTH AND SAFETY, DESIGN CHANGES, PLANT OPERATIONS. *** MONTHLY WASTE DISPOSAL - LIQUID, BETA/GAMMA, 8.1 MILLICURIES - TRITIUM, 112.6 CURIES. GASEOUS DISCHARGES WERE 44.14 MILLICURIES BETA-GAMMA AND 142 MILLICURIES TRITIUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

041923 *CONTINUED*
REPORT, OPERATIONS + REACTOR, PWR + YANKEE ROWE (PWR) + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + OPERATING EXPERIENCE

041924
SELECTED ITEMS OF INTEREST
YANKEE ATOMIC ELECTRIC COMPANY
11 PAGES, YANKEE OPERATION REPORT NO. 62, MARCH 23, 1966, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

AN ABNORMAL OCCURRENCE WAS EXPERIENCED WHEN A FALSE HIGH POWER LEVEL (600 MWT) WAS INDICATED WHILE OPERATING IN A 1 OUT OF 1 MODE. THE RECORD CHANNEL SIGNAL WAS BEING FED TO THE COMPUTER. *** MONTHLY WASTE DISPOSAL - SOLIDS, - 164.4 MILLICURIES - LIQUID, 23 MILLICURIES BETA-GAMMA AND 158.29 CURIES TRITIUM - GASEOUS, 71.84 MILLICURIES. *** A SPECIAL TEST INDICATED HIGHER REACTIVITY WITH HIGHER PH OF PRIMARY COOLANT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REPORT, OPERATIONS + REACTOR, PWR + *SCRAM, REAL + YANKEE ROWE (PWR) + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, SOLID + *FAILURE, INSTRUMENT + *INSTRUMENT, POWER RANGE + GERMANIUM + OPERATING EXPERIENCE

041927
SELECTED OPERATING EXPERIENCE
YANKEE ATOMIC ELECTRIC COMPANY
10 PAGES, YANKEE OPERATION REPORT NO. 65, JUNE 24, 1966, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

ONE OF A SERIES OF REPORTS. TOPICS - OPERATION SUMMARY, MAINTENANCE, INSTRUMENT AND CONTROL, REACTOR PLANT PERFORMANCE, SECONDARY PLANT PERFORMANCE, CHEMISTRY, HEALTH AND SAFETY OPERATION. ROUTINE WASTE RELEASES FOR MAY WERE 1.52 MILLICURIES BETA-GAMMA, 284 CURIES TRITIUM IN LIQUID, AND 339 MILLICURIES GASEOUS BETA-GAMMA.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REPORT, OPERATIONS + REACTOR, PWR + YANKEE ROWE (PWR) + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + OPERATING EXPERIENCE

041959
MONTHLY OPERATIONS REPORT FOR JANUARY 1970 FOR YANKEE
YANKEE ATOMIC ELECTRIC COMPANY, MASSACHUSETTS
7 PAGES, YANKEE OPERATION REPORT NO. 109, JANUARY 1970, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

DURING MONTH, LOAD VARIED BETWEEN 184.8 MWE AND 186 MWE, WITH 3 LOAD REDUCTION TO 130 MWE FOR TURBINE THROTTLE-VALVE TEST AND ISOLATION OF LOOP 4 AND LATER LOOP 2 FOR MAINTENANCE WORK. LEAK RATE FROM PRIMARY TO SECONDARY INCREASED FROM 125 TO 162 GAL PER DAY (PROBABLY NO. 1 STEAM GENERATOR). 1.048 CURIES OF TRITIUM DISCHARGED IN 687,298 GAL LIQUID WASTE. 9 CURIES OF TRITIUM AND 4 CURIES BETA-GAMMA IN GASEOUS WASTE. PLANT-CAPACITY FACTOR WAS 97.5 PERCENT FOR MONTH

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*REPORT, OPERATIONS + REACTOR, PWR + *YANKEE ROWE (PWR) + WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + LEAK

041962
HADDAM NECK MONTHLY OPERATION REPORT FOR JAN., 1970
CONNECTICUT YANKEE ATOMIC POWER COMPANY
50213-1 +. 10 PAGES, HADDAM NECK OPERATION REPORT NO. 70-1, JANUARY 1970, DOCKET 50-312, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

PLANT OPERATED BETWEEN 595 AND 600 MWE EXCEPT FOR 4 ROUTINE TURBINE-VALVE TESTS. NO PLANT SHUTDOWNS AND NO ABNORMAL OCCURRENCES. 1078 CURIES OF TRITIUM RELEASE IN 181,700 GAL LIQUID WASTE, AND 0.018 CURIE IN GASEOUS WASTE RELEASED DURING THE MONTH. PLANT-CAPACITY FACTOR FOR MONTH WAS 98.6 PERCENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*REPORT, OPERATIONS + REACTOR, PWR + *CONNECTICUT YANKEE (PWR) + WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID

041979
OPERATIONS REPORT FROM NBS REACTOR FOR OCTOBER-DECEMBER 1969
NATIONAL BUREAU OF STANDARDS
15 PAGES, LETTER TO DRL FROM NBS, OPERATIONS REPORT NO. 7, FEBRUARY 19, 1970, DOCKET 50-184

041979 *CONTINUED*
REACTOR OPERATED AT FULL 10 MWT THROUGHOUT THIS PERIOD. 15.6 MWHR ENERGY WAS PRODUCED. NO SHUTDOWN OCCURRED AND NO ABNORMAL OCCURRENCES. CONTAINMENT TEST FOR MAIN REACTOR WAS RUN AND SOAP-BUBBLE-TESTED FOR LEAKS. COLD TRAP INSTALLED IN HELIUM SWEEP LINE. SOME CHANGES MADE IN REACTOR SAFETY SYSTEM. 15 SOIL SAMPLES TAKEN IN THE AREA AND ANALYZED. NO SIGNIFICANT CHANGE. .020 CURIE TRITIUM DISCHARGED TO SEWER WITH LIQUID WASTE. 0.1 CURIE ARGON-41 AND 0.1 CURIE TRITIUM RELEASED AS GASEOUS WASTE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REPORT, OPERATIONS + REACTOR, RESEARCH + REACTOR SAFETY SYSTEM + ARGON + CONTAINMENT INTEGRITY + SAMPLING + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + HELIUM + SOIL + NBS

042745
SEMI ANNUAL OPERATING REPORT FOR SAN ONOFRE FOR JULY TO DECEMBER 1969
SOUTHERN CALIFORNIA EDISON COMPANY
8 PAGES, LETTER TO AEC DIVISION OF REACTOR LICENSING FROM SOUTHERN CALIFORNIA EDISON COMPANY, FEBRUARY 12, 1970, DOCKET 50-206, TYPE--PWR, MFG--WEST., AE--BECHTEL

REACTOR PLANT GENERATED 1.35 MILLION MWH OF ELECTRICITY DURING REPORT PERIOD. ON 10-09-69, PLANT WAS SHUT DOWN FOR 7 DAYS WHEN INTAKE STOP GATE (TSUNAMI GATE) DROPPED INTO INTAKE TUNNEL. ON 10-28-69, REACTOR WAS SHUT DOWN TO REPACK THE ROOT VALVES OF THE PRESSURIZER INSTRUMENT COLUMN. STARTUP AFTER 60 HR. 3531 CURIES OF TRITIUM AND 8 CURIES OF BETA-GAMMA WAS RELEASED IN 1,285,000 GAL. OF WATER. 2.5 CURIES OF TRITIUM AND 256 CURIES OF BETA-GAMMA WAS RELEASED IN 15,640,000 CUBIC FEET OF GASEOUS WASTE. VIBRATION-TESTS PROGRAM OF CORE COMPONENTS WAS COMPLETED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FAILURE, EQUIPMENT + *REPORT, OPERATIONS + REACTOR, PWR + *SAN ONOFRE 1 (PWR) + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + HEAT SINK + *TSUNAMI + *VIBRATION ANALYSIS + OPERATING EXPERIENCE + VALVES

043090
REICHERT SO
RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES
E. I. DUPONT DE NEMOURS AND COMPANY, AIKEN, S.C.

DISPOSAL OF RADIOACTIVITY TO THE GROUND HAS BEEN LIMITED TO THE BURIAL OF SOLID WASTE AND THE DISCHARGE OF VERY-LOW-LEVEL WASTE TO OPEN SEEPAGE BASINS. NO RADIONUCLIDES HAVE BEEN DETECTED IN GROUNDWATER FROM THIS SOURCE. SEEPAGE BASIN RETENTION OF RADIONUCLIDES HAS BEEN LESS SATISFACTORY. ALL OF THE RADIONUCLIDES RELEASED TO THE SEEPAGE BASINS, EXCEPT PLUTONIUM, HAVE BEEN DETECTED IN THE SURROUNDING GROUNDWATER. TRITIUM IS NOT ABSORBED AND THUS SERVES AS A USEFUL GROUNDWATER TRACER. STRONTIUM 90 IS POORLY ADSORBED ON LOCAL SOIL AND IS DETECTABLE IN SAND LAYERS, AT CONCENTRATIONS LESS THAN THE RADIOACTIVITY CONCENTRATION GUIDE, AS FAR AS 500 FEET FROM THE BASINS. THE PATH OF RADIONUCLIDE MIGRATION FROM SEEPAGE BASINS IS DETERMINED BY THE GEOLOGY AND HYDROLOGY OF EACH AREA.

ADSORPTION + GUIDE + GEOLOGY + *STRONTIUM + TRACER, RADIOACTIVE + *WASTE DISPOSAL, TERRESTRIAL + GROUND WATER, NUCLIDE OCCURRENCE + *SAVANNAH RIVER PLANT + HYDROLOGY + *SURVEILLANCE PROGRAM + MONITOR, AREA + CONCENTRATION

043147
YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 110 - FOR MONTH OF FEBRUARY 1970
YANKEE ATOMIC ELECTRIC COMPANY, WESTBORO, MASSACHUSETTS
6 PAGES, YANKEE OPERATION REPORT NO. 110 FOR FEBRUARY 1970, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

GROSS GENERATIONS FOR MONTH WAS 117,310 MWH(E). PRIMARY TO SECONDARY LEAK RATE IN NO. 1 STEAM GENERATOR INCREASED FROM 162 TO 240 GAL/DAY. MAIN COOLANT BORON CONCENTRATION DECREASED FROM 632 PPM TO 588 PPM. TRITIUM CONCENTRATION DECREASED FROM 2.03 MICROCURIE/ML TO 1.83 MICROCURIE/ML. 95.6 CURIES OF TRITIUM RELEASED FROM PRIMARY AND 44.7 CURIES FROM SECONDARY GASEOUS RELEASE 2.05 CURIES OF BETA-GAMMA. AVERAGE PERSONNEL EXPOSURE WAS 54 MREM. MASS EXPOSURE WAS 240 MREM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

REPORT, OPERATIONS + REACTOR, PWR + *YANKEE ROWE (PWR) + WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + *PERSONNEL EXPOSURE, RADIATION + FAILURE, TUBING + STEAM GENERATOR

043172
HADDAM NECK OPERATION REPORT FOR FEBRUARY 1970
CONNECTICUT YANKEE ATOMIC POWER COMPANY
12 PAGES, HADDAM NECK OPERATION REPORT NO. 70-2 FOR THE MONTH OF FEBRUARY 1970, DOCKET 50-213, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

PLANT PUT OUT 366,550 MWH OF ELECTRICITY AND 826 CURIES OF TRITIUM WITH LIQUID WASTE, 1.4 CURIES OF BETA-GAMMA IN LIQUID WASTE, 69 CURIES XE IN GASEOUS WASTE, AND 2 CURIES KR IN GASEOUS WASTE. ON FEBRUARY 19, REACTOR DROPPED TO 75% OF FULL POWER. A LEAK BETWEEN PRIMARY AND SECONDARY IN

043172 *CONTINUED*
NO. 4 STEAM GENERATOR WAS TRACED WITH THE TRITIUM ACTIVITY AND CALCULATED TO BE 5 TO 10 GAL/DAY (FEB. 2). INCREASE TO 1700 GAL/DAY BY FEB. 18. HIGHEST RADIATION EXPOSURE WAS 761 MREM. AVERAGE FOR ALL PERSONNEL WAS 175 MREM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

KRYPTON + *REPORT, OPERATIONS + REACTOR, PWR + *CONNECTICUT YANKEE (PWR) + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + FAILURE, TUBING + *STEAM GENERATOR + *LEAK

043306
GROOT-WESSELDIJK A
EXPERIENCE WITH THE USE OF RADIOACTIVE HYDROGEN IN INDUSTRY
PHILIPS GLOEILAMPENFABRIEKEN, N.V., EINDHOVEN, NETHERLANDS
4 PAGES, TIJDSCHRIFT SOCIALE GENEESKUNDE, VOL. 42, PG 854-7 (1964)

WHEN IT WAS NECESSARY TO USE A RADIOACTIVE SUBSTANCE IN THE MASS PRODUCTION OF A CERTAIN TYPE OF RADIO TUBES THE HYDROGEN ISOTOPE TRITIUM (H-3) WAS CHOSEN. PREFERENCE WAS GIVEN TO TRITIUM AS A GAS AND NOT IN A CHEMICAL COMBINATION. IN CASE THE GAS IS ACCIDENTALLY INHALED IT IS NOT DEPOSITED IN AN ORGAN OR TISSUE. INSTEAD THE TRITIUM IS DISSOLVED IN THE BODY FLUIDS AND RAPIDLY EXCRETED BY THE KIDNEYS. OCCASIONALLY SMALL AMOUNTS OF TRITIUM WERE FOUND IN THE URINE OF MEN WORKING WITH THE ISOTOPE.

DEPOSITION + INHALATION + *GAS + INDUSTRIAL SAFETY + TELEVISION + EXCRETION, URINE + BODY FLUID

043571
THIE JA
ELK RIVER REACTOR SYSTEM MONITORING DATA
ARGONNE NATIONAL LABORATORY, ILLINOIS
COO-651-49 +. 64 PAGES, JUNE 30, 1967

PRESENTS IN-PLANT MONITORING DATA FOR THE ELK RIVER REACTOR FOR PERIOD JULY 1, 1966 THROUGH JUNE 30, 1967.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*CONTAINMENT + EFFLUENT + *ELK RIVER (BWR) + FUEL INTEGRITY + TESTING + SAMPLING + SURVEY, RADIATION + *RADIATION SAFETY AND CONTROL + SYSTEM DESCRIPTION + *SAFETY ANALYSIS + OPERATING EXPERIENCE

043843
SAFETY REPORT FOR THE CORE ARRANGEMENT WITH TWO FISSIONING REGIONS - SUPPLEMENT TO THE SAFETY REPORT SUBMITTED TO THE LICENSING AUTHORITY IN APRIL 1966 REGARDING THE RESEARCH AND MEASUREMENT REACTOR (FMRB)
FEDERAL INSTITUTE OF PHYSICS AND TECHNOLOGY, BRUNSWICK
37 PAGES, 7 FIGURES, SUPPLEMENT TO THE SAFETY REPORT SUBMITTED TO THE LICENSING AUTHORITY IN APRIL 1966 REGARDING THE RESEARCH AND MEASUREMENT REACTOR (FMRB), AUGUST 1968

THE FMRB (RESEARCH AND MEASUREMENT REACTOR, BRUNSWICK) IS MODIFIED TO CONSIST OF TWO FISSIONABLE GASES, WITH A HEAVY-WATER TANK IN-BETWEEN, AND A BEAM TUBE IN THE MIDDLE OF THIS TANK (SEE SAFETY REPORT AND EXPERT OPINION ON THIS REACTOR). AMONG THE MANY SAFETY QUESTIONS CONSIDERED ARE STEP REACTIVITY CHANGES, CONTROL AND STABILITY TRITIUM. LEAK EVOLUTION IN A REACTIVITY ACCIDENT, NUCLEAR ACCIDENTS.

AVAILABILITY - PHYSIKALISCH-TECHNISCHE BUNDESANSTALT, BRUNSWICK, GERMANY

CONTROL SYSTEM + DEUTERIUM + ACCIDENT, REACTIVITY + REACTOR DYNAMICS + REACTOR STABILITY + REACTOR, RESEARCH + *GERMANY + *REACTOR, INTERACTING + *REACTOR, POOL TYPE + *SAFETY ANALYSIS

043845
EXPERT OPINION ON THE SAFETY OF THE RESEARCH AND MEASUREMENT REACTOR, BRUNSWICK
TECHNOLOGICAL SUPERVISION ASSOCIATION HANOVER INC. + INSTITUTE FOR REACTOR SAFETY OF THE TUV, INC.
50 PAGES, FIGURES, RESEARCH AND MEASUREMENT REACTOR SAFETY EVALUATION, MAY 1966

EXPERT OPINION ON THE RESEARCH AND MEASUREMENT REACTOR BRUNSWICK (FOR DESCRIPTION SEE SAFETY REPORT ON THIS REACTOR). IT IS CONCLUDED THAT THE REACTOR WILL, NEITHER IN NORMAL OPERATION NOR IN CREDIBLE ACCIDENTS, CAUSE UNDUE RADIATION IN THE SURROUNDINGS. THIS PROPOSES THAT FURTHER DOCUMENTATION (LISTED IN SECTION 12) IS SUPPLIED AND DOES NOT LEAD TO OBJECTIONS, THAT THE INITIAL TESTS (LISTED IN SECTION 8) ARE CARRIED OUT SATISFACTORILY AND THAT RECURRENT TESTS (LISTED IN SECTION 8.2) ARE CARRIED OUT BY INDEPENDENT EXPERTS.

AVAILABILITY - TECHNISCHER UBERWACHUNGS-VEREIN HANOVER E.V., GERMANY

PROCEDURES AND MANUALS + *REACTOR, RESEARCH + SHUTDOWN MARGIN + GERMANY + REACTOR, INTERACTING + RADIOACTIVITY RELEASE + REACTOR, POOL TYPE + *SAFETY ANALYSIS + LEAK RATE

043847
MISCELLANEOUS LICENSING MATERIAL REGARDING THE RESEARCH AND MEASUREMENT REACTOR BRUNSWICK
TECHNOLOGICAL SUPERVISION ASSOCIATION HANOVER, INC. + INSTITUTE FOR REACTOR SAFETY OF THE TUV, INC.
30 PAGES, FRBM LICENSING MATERIAL, 1969

CONSTRUCTION PERMIT (LIST OF INTERVIEWS, CONTRACTORS, CONDITIONS, PARTICULARLY INVOLVING WASTE DISPCSAL). FIRST SUPPLEMENTARY LICENSE REGARDING INSTALLATION AND USE OF FOUR CONTROL-ROD-FUEL ELEMENTS, WITH CONDITIONS. OPERATING LICENSE WITH 78 CONDITIONS. MODIFICATION OF ONE OF THE CONDITIONS OF THE OPERATING LICENSE CONTROL CAPABILITY IN NEW FUEL ELEMENT ARRANGEMENTS. CONSTRUCTION AND OPERATING PERMIT FOR THE ARRANGEMENT WITH TWO FISSICNABLE REGIONS AND A HEAVY-WATER TANK IN BETWEEN, AND 14 CONDITIONS WITH THEIR JUSTIFICATION.

AVAILABILITY - INSTITUT FUR REAKTORSICHERHEIT DEP TUV E.V., GERMANY

HEAVY WATER + REACTOR, RESEARCH + WASTE HANDLING + *CONSTRUCTION PERMIT PROCESS + REACTOR, INTERACTING + REACTOR, POOL TYPE + OPERATING LICENSE PROCESS + CONTROL RODS

043985
THOMPSON TJ
THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS
ATCMIC ENERGY COMMISSION
6 PAGES, ATCMIC ENERGY CLEARING HOUSE, 15(44), PG 26-31 (NOVEMBER 3, 1969)

FURTHER (EXPLICIT) TESTIMONY AT JCAE HEARING ON ENVIRONMENTAL EFFECTS OF ALL TYPES OF POWER STATIONS. THEOS THOMPSON (COMMISSIONER, AEC) SUPPLIES FIVE TABLES SHOWING GASEOUS AND LIQUID EFFLUENTS FROM 14 LICENSED N-POWER REACTORS IN 1967, 11 IN 1968, ANC A COMPARISON OF RELEASES FOR THE TWO YEARS. THE ACTUAL RELEASES IN CURIES, THE CONCENTRATION LIMITS FOR EACH REACTOR AS SET FORTH IN OFFICIAL REGULATORY DOCUMENT (STANDARDS FOR PROTECTION AGAINST RADIATION, 10 CFR, PART 20) -- I.E., MICRCCURIES PER MILLILITER FOR FISSION AND CORROSION PRODUCTS AND CURIES FOR TRITIUM HALOGENS, AND NOBLE GASES ARE GIVEN. BASED ON THESE TWO SETS OF FIGURES, THE PERCENTAGES OF LIMITS AND/OR MAX. PERMISSIBLE CONCENTRATIONS ARE LISTED FOR EACH REACTOR.

BIG ROCK POINT (BWR) + BONUS (ISR) + CODES AND STANDARDS + CONGRESSIONAL ACTIVITY + DRESDEN 1 (BWR) + ELK RIVER (BWR) + FERMI (LMFBR) + HUMBOLDT BAY (BWP) + INDIAN POINT 1 (PWR) + NOBLE GAS + PATHFINDER (ISR) + PEACH BCTTCM 1 (HTGR) + SAXTON (PWR) + YANKEE ROWE (PWR) + REACTOR, POWER + SAN ONOFRE 1 (PWR) + REGULATION, AEC + *REACTOR + *RADIOACTIVITY RELEASE + LACROSSE (BWR) + *SPOKESMAN, AEC + (THOMPSON T)

043989
LARSON CE
THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS
US. ATOMIC ENERGY COMMISSION
3 PAGES, ATCMIC ENERGY CLEARING HOUSE, 15(44), PG 32-34 (NOVEMBER 3, 1969)

FURTHER (EXPLICIT) TESTIMONY AT JCAE HEARING ON ENVIRONMENTAL EFFECTS OF ALL TYPES OF POWER STATIONS. C. E. LARSON (CCMMISSIONER, AEC) DISCUSSED SMALL NUCLIDE RELEASES AND DISCHARGE OF SUBSTANTIAL QUANTITIES OF LOW-TEMPERATURE HEAT DURING NORMAL REACTOR OPERATION. HE QUOTES NAT. ACAD. OF SCI. -- THAT RADIATION IS BEST UNDERSTOOD ENVIRONMENTAL HAZARD, THAT VASTLY LESS IS KNOWN ABOUT OTHER CHEMICAL AGENTS, AND THAT ONLY REGARDING RADIATION HAS THERE BEEN DETERMINATION TO MINIMIZE RISK AT ALMOST ANY COST. HE STATES (1) SIGNIFICANT FACTS AND FIGURES ON TRITIUM AND KRYPTON, (2) CURRENT N-PLANTS ARE MORE EFFICIENT THAN AVERAGE CURRENTLY OPERATING STEAM PLANTS, AND (3) 5 SPECIFIC OBJECTIVES OF R AND D PROGRAMS SUPPORTED BY AEC TO DETERMINE FACTORS ASSOCIATED WITH THERMAL EFFECTS.

CONGRESSIONAL ACTIVITY + KRYPTON + SITING, REACTOR + ATMOSPHERIC POLLUTION + REACTOR POWER + RADIOACTIVITY RELEASE + *ENVIRONMENT + WATER POLLUTICN + THERMAL POLLUTION + *N-POWER, SAFETY OF + PROPONENT + *SPOKESMAN, AEC

047843
MOUNTAIN JE + LEONARC JH
TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR
UNIVERSITY OF CINCINNATI
1 PAGES, 1 TABLE, 5 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 13(1), P. 220 (JUNE 1970)

TRITIUM PRODUCTION CYCLE OF THE SAN ONOFRE AND CONNECTICUT YANKEE REACTORS FROM TERNARY FISSION AND FROM BORON AND LITHIUM COOLANT ADDITIVES WAS EVALUATED. PRODUCTION OF TRITIUM WAS EVALUATED AS A FUNCTION OF VARIOUS PARAMETERS WHICH AFFECT THE REMOVAL RATE OF LI-7 FROM THE COOLANT. THE RELATIVE CONTRIBUTION OF EACH TRITIUM-PRODUCING REACTION WAS OBTAINEC, AS WELL AS THE RELATIVE TRITIUM ACTIVITY PRODUCED BY EACH REACTION IN THE CORE AND REFLECTOR. TRITIUM RELEASE DATA FOR CONNECTICUT YANKEE WAS COMPARED TO THE TRITIUM ACTIVITY CALCULATED FOR THE BORON AND LITHIUM NEUTRON REACTIONS.

AVAILABILITY - J.E. MOUNTAIN, UNIVERSITY OF CINCINNATI, OHIO 45521

BORON + DECONTAMINATION + *DIFFUSION + *CLADDING + FISSION GAS RELEASE + REACTOR, PWR + POISON, SOLUBLE + *REACTOR COOLANT + *SAN ONOFRE 1 (PWR) + *STEEL, STAINLESS + *RADIOACTIVITY RELEASE + ENVIRONMENT + LITHIUM + *LEAK + PARAMETER

048572
LOGSDON JE + CHISSLER RI
RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES.
BUREAU OF RADIOLOGICAL HEALTH, ROCKVILLE, MARYVILLE
BRH/DER-70-2 + PB-190717 +. 77 PAGES, MARCH 1970

SUMMARIZES DISCHARGES OF RADIOACTIVE MATERIAL TO THE ENVIRONMENT FROM NINE SELECTED NUCLEAR POWER FACILITIES AND REGULATES THE DISCHARGES TO POWER PRODUCED AND PLANT MAINTENANCE OPERATIONS. THE FACILITIES REPRESENT THREE BASIC REACTOR TYPES - PRESSURIZED WATER, BOILING WATER, AND HIGH-TEMPERATURE GAS. FACILITIES NOT INCLUDED IN EITHER REPRESENT UNIQUE DESIGNS NOT BEING CONSTRUCTED IN THE PRESENT GENERATION OF POWER PLANTS, OR THEY ARE SMALLER PLANTS SIMILAR IN DESIGN TO THOSE WHICH ARE INCLUDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ADMINISTRATIVE CONTROL + BIG ROCK POINT (BWR) + REACTOR, BWR + DRESDEN 1 (BWR) + *EFFLUENT + REACTOR, GCR + HUMBOLDT BAY (BWR) + INDIAN POINT 1 (PWR) + PEACH BOTTOM 1 (HTGR) + REACTOR, PWR + CONNECTICUT YANKEE (PWR) + *REACTOR, POWER + WASTE MANAGEMENT + *RADIOACTIVITY RELEASE + *ENVIRONMENT + *REPORT, OPERATIONS SUMMARY + *REACTOR, HTGR + OPERATING EXPERIENCE + DATA COLLECTION + *COMPARISON + INDUSTRY, NUCLEAR

051297
ASHLEY C
EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JULY THROUGH DECEMBER 1963.
OPSPU-64-30-1 + OPSPU-64-30-2 + OPSPU-65-30-1 + OPST-65-30-2 + OPST-66-30-1 + OPST-66-30-2 +.

CERIUM + CESIUM + COBALT + RIVER + RUTHENIUM + STRONTIUM + ZIRCONIUM + CHROMIUM + MANGANESE + NEPTUNIUM + SAVANNAH RIVER PLANT + RADIOISOTOPE + ENVIRONMENT + EFFECT + TRANSPORT + PLANT + FOOD INTAKE

051305
REICHERT SO
RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES.
JOURNAL OF GEOPHYSICAL RESEARCH 67 PAGES 4363-4374 1962

GROUND WATER + RIVER + WASTE DISPOSAL + SAVANNAH RIVER PLANT + RADIOISOTOPE + TRANSPORT + PLANT

052042
BUTLER GC
EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL REACTOR STACK.
AECL-1518 +.

DILUTION + STACK + AIR + PRECIPITATION + REACTOR + RATE + AECL + TRANSPORT

052407
HORTON JH
FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.
OPSPU-63-30-388 +.

FISSION PRODUCT RELEASE + RIVER + SAVANNAH RIVER PLANT + PLANT

055028
GAMERTSFELDER CC
STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF RADIOLOGICAL AND ENVIRONMENTAL PROTECTION
25 PAGES, FIGURES, TABLES, STATEMENT PRESENTED AT THE AEC RULEMAKING HEARINGS ON EFFLUENTS FROM LIGHT WATER COOLED NUCLEAR POWER REACTORS, JANUARY 20, 1972

DISCUSSES THE OPERATING EXPERIENCE OF MAJOR LIGHT-WATER-COOLED REACTORS WITH RESPECT TO DISCHARGES OF RADIOACTIVE MATERIALS IN LIQUID AND GASEOUS EFFLUENTS, INCLUDING THE COMPOSITION AND QUANTITIES OF WASTES RELEASED AND THE RESULTING DOSES TO PEOPLE AT THE BOUNDARY AND ELSEWHERE IN THE SURROUNDINGS.

AVAILABILITY - C. C. GAMERTSFELDER, ASST. DIR., USAEC DIVISION OF RADIOLOGICAL AND ENVIRONMENTAL PROTECTION, WASHINGTON, D. C.

EFFLUENT + MPC + WATER, DRINKING + OPERATING EXPERIENCE SUMMARY + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + POPULATION EXPOSURE + DOSE MEASUREMENT, EXTERNAL + DOSE CALCULATION, EXTERNAL + *RADIOACTIVITY RELEASE + CONCENTRATION

055112
KELLY MJ + BARTON CJ + MEYER AS + CHEN EW + BOWMAN CR
THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-4775 +. 41 PAGES, FIGURES, TABLES, JULY 1972

055112 *CONTINUED*
DATA OBTAINED IN THIS PLANT TEST INDICATE THAT PROCESSING OF NATURAL GAS CONTAINING TRITIATED HYDROCARBONS AT LEVELS EXPECTED TO PREVAIL IN LARGE-SCALE EXPLOITATION OF THE NUCLEAR GAS-STIMULATION TECHNIQUE WILL NOT PRESENT SIGNIFICANT RADIATION EXPOSURE PROBLEMS FOR PLANT PERSONNEL. NO EVIDENCE OF EXCHANGE OF TRITIATED HYDROCARBONS WITH THE PLANT PROCESSING OIL WAS FOUND, AND IT SEEMS PROBABLE THAT PLANT OPERATORS IN ANY PROCESSING PLANT WOULD RECEIVE DOSES LESS THAN 1% OF NATURAL BACKGROUND FROM BREATHING AIR CONTAINING COMBUSTION PRODUCTS RESULTING FROM IN-PLANT USE OF THE TRITIUM-CONTAMINATED GAS AS FUEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLOWSHARE + *NUCLEAR DETONATION + DOSE MEASUREMENT, EXTERNAL + *CONTAMINATION + *PERSONNEL EXPOSURE, RADIATION + GAS + *CONSUMER PRODUCT + STIMULATION + RESOURCE, NATURAL

055992
SAGAN LA
HUMAN RADIATION EXPOSURES FROM NUCLEAR POWER REACTORS
5 PAGES, ARCHIVES OF ENVIRONMENTAL HEALTH, 22(4), PP. 487-491 (APRIL 22, 1971)

IN ASSESSING RADIATION EXPOSURE HAZARDS FROM N-REACTORS, AUTHOR DESCRIBES REACTOR OPERATION, BIOLOGICAL EFFECTS OF SIGNIFICANT RADIONUCLIDES, AND PROBABLE DOSES FROM EXPOSURE. HE DISCUSSES POSSIBLE AMOUNTS IN DRINKING WATER, FISH, AND AIR. TRITIUM AND KRYPTON POSE SPECIAL CONSIDERATION, E.G., THEIR HALF-LIVES. HE NOTES THAT RADIATION FROM N-POWER PLANTS HAVE BEEN CONSISTENTLY BELOW PERMISSIBLE STANDARD LEVELS.

DOSE + FISSION PRODUCT RELEASE + KRYPTON + HAZARD, RELATIVE + WATER + AIR + POPULATION EXPOSURE + RADIATION SAFETY AND CONTROL + *RADIOACTIVITY RELEASE + ANIMAL, FISH + RADIATION EFFECT + RADIATION EXPOSURE + *SPOKESMAN, AEC + *POWER PLANT, NUCLEAR

057294
FEHER I + BIRO J
INVESTIGATION OF ZR-T AEROSOL
MAGYAR TUDOMANYOS AKADEMIA KOZPONTI FIZIKAI KUTATO INTEZETE, BUDAPEST
KFKI-70-9 +. 12 PAGES, 1970

THE HANDLING OF TRITIUM TARGETS IN NEUTORN GENERATORS, AS INDICATED ALSO BY THE EXPERIMENTS, DOES NOT LEAD TO THE DETACHMENT OF INHALABLE ZR-T AEROSOLS OF SIGNIFICANT ACTIVITY. HIGH ACTIVITY PARTICLES LARGER THAN 10 MICRONS IN DIAMETER MAY APPEAR OCCASIONALLY IN THE BREATHING ZONE. THOUGH THEY CAN DEPOSIT IN THE NASAL-PHARYNGEAL TRACT, THE ZR-T CONTAMINATION OF THE LOWER RESPIRATORY TRACT HAS NOT TO BE FEARED. THE ZR-T PARTICLES DETACHED FROM THE TARGET MAY CONTAMINATE THE SKIN SURFACE OF THE OPERATORS AND RESULT IN AN INTERAL CONTAMINATION DUE TO PERCUTANEOUS ABSORPTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*AEROSOL + BIOMEDICAL + *ZIRCONIUM + AEROSOL PROPERTIES + *ACCELERATOR + OPERATING EXPERIENCE

058166
SELECTED ITEMS OF INTEREST
DAIRYLAND POWER COOPERATIVE
DOCKET 1155-72 +. 25 PAGES, LACROSSE BWR MONTHLY REPORT FOR JUNE 1970, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

THERE WERE EIGHT SCRAMS - (1) THREE BY SPURIOUS HIGH PRESSURE SIGNALS, (2) THREE FROM HIGH FLUX RESULTING FROM STARTING FEED WATER PUMPS, DOWN SCALING RANGE CHANGE, UP SCALING RANGE WITH AMPLIFIER FAILURE , (3) ONE FROM INDICATED LOW RECIRCULATING FLOW FROM GAS IN SUCTION LINES, (4) ONE FROM OPERATOR WHO TURNED OPERATE KEY OFF WHILE DUSTING CONSOLE. AIR ACTIVITY IN LOWER REACTOR CAVITY WAS TRACED TO LEAKAGE FROM FUEL-ELEMENT STORAGE WELL WHEN TRITIUM LEVEL IN CAVITY WITH REACTOR DEPRESSURIZED WAS SAME AS THAT DURING REACTOR OPERATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + FAILURE, EQUIPMENT + FAILURE, OPERATOR ERROR + REPORT, OPERATIONS + *SCRAM, REAL + *INSTRUMENT, FLOW + SCRAM, SPURIOUS + LACROSSE (BWR) + LEAK + OPERATING EXPERIENCE

058861
LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
BRH/NERHL 70-2 +. 59 PAGES, 19 FIGURES, 23 TABLES, NOVEMBER 1970

LIQUID WASTE EFFLUENTS FROM NUCLEAR FUEL SERVICES WERE STUDIED DURING A SIX-MONTH PERIOD MAY THROUGH OCTOBER 1969. CONCENTRATIONS AND AMOUNTS OF INDIVIDUAL RADIONUCLIDES DISCHARGED FROM THE PLANT WERE MEASURED AND THE AMOUNTS OF SEDIMENTATION OF INDIVIDUAL RADIONUCLIDES IN THE LAGOON SYSTEM WERE ESTIMATED. TRITIUM, RUTHENIUM-106, STRONTIUM-90, CESIUM-137 AND CESIUM-134 WERE THE PRINCIPAL RADIONUCLIDES DISCHARGED TO THE ENVIRONMENT DURING THIS PERIOD. DURING JUNE AND NOVEMBER 1969 SIMULTANEOUS SAMPLING WAS CARRIED OUT AT THE POINT OF DISCHARGE OF THE WASTE AND SEVERAL LOCATIONS ON THE BUTTERMILK AND CATTARAUGUS CREEKS. TRITIUM, RUTHENIUM-106, AND STRONTIUM-90 WERE THE RADIONUCLIDES PRESENT IN THE HIGHEST CONCENTRATIONS IN THESE STREAMS DURING THESE PERIODS. STREAM DILUTION AND ABSORPTION FACTORS WERE CALCULATED FOR INDIVIDUAL RADIONUCLIDES AT VARIOUS LOCATIONS ALONG THE STREAM SYSTEM. A COMPARISON OF THE CONCENTRATIONS OF THE

J58861 *CONTINUED*
RADIONUCLIDES IN CATTARAUGUS CREEK WITH 10CFR20 DISCHARGE CONCENTRATIONS LIMITS. ALL RADIONUCLIDES WERE WELL BELOW CONCENTRATION LIMITS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + MEASUREMENT + RUTHENIUM + STRONTIUM + REGULATION, AEC + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RADIOACTIVITY RELEASE + NFS + FUEL REPROCESSING + MONITORING PROGRAM, ENVIRONMENTAL + CONCENTRATION + SEDIMENT

061410
COCHRAN JA + SMITH OG + MAGNO PJ + SHLEIEN B
AN INVESTIGATION OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL REPROCESSING PLANT
PUBLIC HEALTH SERVICE, BUREAU OF RADIOLOGICAL HEALTH, MARYLAND
BRH/NERHL-70-3 +. 39 PAGES, 11 FIGURES, 14 TABLES, 12 REFERENCES, JULY 1970

DESCRIBES STUDIES CARRIED OUT AT AN OPERATING NUCLEAR FUEL REPROCESSING PLANT FOR THE PURPOSES OF CHARACTERIZING THE STACK EFFLUENT, MEASURING THE ENVIRONMENTAL LEVELS OF ACTIVITY DUE TO COMPONENTS OF STACK RELEASE, AND EVALUATING INSTRUMENTATION AND METHODOLOGY USED TO SAMPLE BOTH AT THE STACK AND IN THE ENVIRONMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT + IODINE + KRYPTON + *MEASUREMENT + SAMPLING + *STACK + *MONITOR, ENVIRONMENTAL + POPULATION EXPOSURE + METEOROLOGY + *FUEL REPROCESSING + INSTRUMENTS, MISC.

061489
MEGERTH FH
ZIRCALOY - CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT II, MAY - JULY 1970
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
GEAP-10217 +. 52 PAGES, AUGUST 1970

PROGRESS REPORT ON STUDY OF PERFORMANCE OF SA-1 FUEL RODS (ZIRCALOY-2 CLADDING, UO2 FUEL). DESCRIBES EXAMINATIONS AND ANALYSES OF THE RODS (GAMMA SCANNING, DIAMETRAL MEASUREMENTS, EXAMINATIONS OF DE-CRUDDED RODS, NEUTRON RADIOGRAPHY OF RODS, GAS COLLECTION, AND ANALYSES OF CLADDING FOR TRITIUM).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING + FISSION GAS RELEASE + *FUEL BURNUP + FLAW + CRUD + ZIRCALOY + *EXAMINATION + SURFACE FILM DEPOSIT + EXPANSION + *FUEL ROD

062663
OECD HIGH-TEMPERATURE REACTOR PROJECT DRAGON, 11TH ANNUAL REPORT 1969-1970
ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, PARIS (FRANCE)
NP18668 +. 197 PAGES, 1970

THE OPERATION OF THE REACTOR EXPERIMENT PROCEEDED WITH FEW INTERRUPTIONS, EXCEPT FOR THE RECHARGING OF FUEL ELEMENTS DURING THE FIRST HALF OF THE PERIOD DESPITE THE EXISTENCE OF SERIOUS CORROSION IN THE PRIMARY CIRCUIT HEAT EXCHANGERS. DURING THE YEAR THE MANUFACTURE OF TWO COMPLETE NEW SETS OF HEAT EXCHANGERS (ONE WITH STEEL, AND THE OTHER WITH INCOLOY 800 TUBES) WAS COMPLETED AND THE SETS WERE DELIVERED TO WINFRITH. NEW SECONDARY CIRCUIT PUMPS WERE ALSO PROCURED TO REDUCE THE FLOW INSTABILITY ON THE SECONDARY SIDE OF THESE HEAT EXCHANGERS, AND TO INCREASE THEIR HEAT REMOVAL CAPACITY OF 25 MW. IT HAS BEEN PLANNED TO COMPLETE THE IRRADIATIONS OF NINE CORES OF THE THIRD CHARGE AND TO SHUT DOWN THE REACTOR EXPERIMENT FOR AN EXTENDED PERIOD FROM MARCH 1970 FOR THE REPLACEMENT OF THE PRIMARY HEAT EXCHANGERS AND FOR MODIFICATIONS TO THE SECONDARY CIRCUIT TO TAKE THE NEW PUMPS. IN THE EVENT, BECAUSE OF HIGH INCIDENCE OF TUBE FAILURES AT THE END OF THE IRRADIATION OF CORE 7, AND BECAUSE THE NEW PUMPS WERE AVAILABLE, IT WAS DECIDED TO BRING FORWARD THE PROGRAMME FOR THE INSTALLATION OF THE NEW MILD STEEL HEAT EXCHANGERS AND THE SECONDARY CIRCUIT MODIFICATION.

FABRICATION + REACTOR, GCR + GRAPHITE + REACTOR, GRAPHITE MODERATED + MAINTENANCE AND REPAIR + UNITED KINGDOM + COOLANT CHEMISTRY + *DRAGON (HTGR) + HELIUM + *REPORT, OPERATIONS SUMMARY + REACTOR PHYSICS + REACTOR, HTGR + HEAT EXCHANGERS + FUEL ELEMENTS

063294
YANKEE NUCLEAR POWER STATION, OPERATION REPORT NO. 124, FOR APRIL 1971
YANKEE ATOMIC ELECTRIC COMPANY, WESTBORO, MASSACHUSETTS
DOCKET-50029-151 +. 9 PAGES, FIGURES, TABLES, REPORT TO DIVISION OF REACTOR LICENSING (USAEC) FROM YANKEE ATOMIC ELECTRIC COMPANY, MAY 21, 1971, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE-- STONE + WEBSTER

NO ABNORMAL OCCURRENCES DURING THE REPORT PERIOD. THE PROGRAM OF RECALIBRATION OF ALL PRIMARY AUXILIARY AND WASTE DISPOSAL INSTRUMENTATION WAS CONTINUED. THE IODINE-131 SPECIFIC ACTIVITY AVERAGED 6.8 X 10(-4TH) MICROCURIE/ML. THE IODINE 131/133 ATOMIC RATIO AVERAGED 2.38, INDICATING NO SIGNIFICANT CHANGE IN THE MAGNITUDE OF FUEL CLAD DEFECTS DURING THE MONTH. WASTE DISPOSAL LIQUID RELEASES TOTALED 23,605 GAL, CONTAINING 0.007 MC OF GROSS BETA-GAMMA ACTIVITY AND 77.82 CURIES OF TRITIUM. GASEOUS ACTIVITY AND 3.39 MC OF TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

063294 *CONTINUED*
IODINE + REACTOR, PWR + WASTE DISPOSAL + *CONNECTICUT YANKEE (PWR) + GROSS BETA + GROSS GAMMA + INSTRUMENT CALIBRATION + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + FAILURE, CLADDING + *REPORT, OPERATIONS SUMMARY

064725
BUSH WR
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER NUCLEAR LABORATORY, CANADA
AECL-2756 +. 17 PAGES, 6 FIGURES, 3 TABLES, 7 REFERENCES, 1967

MOST OF THE EXPOSURES RESULTED FROM INTAKE OF HTO VAPOUR THROUGH THE UNWETTED SKIN OF MEN WEARING AIR-SUPPLIED MASKS AND COTTON OVERALLS, WHERE DTO IS EXPOSED TO THE AIR IN VICINITY OF THE NRU REACTOR WHICH IS WATER-COOLED, D2O MODERATED. AVERAGE HTO ABOVE THE REACTOR WAS 0.17 (MPC)A IN 1964-5, A STANDARD MAN RECEIVING 850 MREM/YR FROM SUCH A CONCN, 40 HR/WK, BUT SINCE REAL MEN ABSORB HTO ONLY HALF AS FAST (NSIC NO. 56159), AND WORK 30 HR/WK, THEY SHOULD HAVE RECEIVED 320, BUT ACTUALLY GOT 120 MREM/YR, IN AREAS AVERAGING LESS THAN OVER THE REACTOR, 5000 MREM/YR BEING THE LIMIT SET BY CANADIAN LAW. AVERAGE DOSES TO NRU OPERATING PERSONNEL IN 1966 WERE 700 MREM FROM HTO + 1.2 R FROM GAMMA RAYS, AVERAGE HTO DOSE RECEIVED BY 50 MEN REMOVED FROM EXPOSURE AREAS BEING 230 MREM. MEN ARE REMOVED FROM FURTHER HTO EXPOSURE IF THEIR URINE CONTAINS 20 MICROCURIES PER LITER OR MORE AND KEPT AWAY UNTIL URINE LEVEL DROPS TO 6 UCI/L (USUALLY 3 WKS). MEN WITH 7 TO 10 UCI/L ARE CLASSIFIED AS HAVING MINOR HTO CONTAM. AIR-SUPPLIED MASKS WORN IF ANTICIPATED DAILY EXPOSURE EXCEEDS 8(MPC)A HOURS, BUT NOT ALWAYS WHEN HTO CONCN WAS ONLY 2 OR 3 PICOCURIES PER LITER OF D2O. ROUGHLY EQUAL AMTS OF HTO ARE ABSORBED THROUGH SKIN AND LUNGS. 16(MPC)A-HOURS PERMISSIBLE WITH MASKS.

CANADA + CODES AND STANDARDS + OXIDE + DOSE CALCULATION, INTERNAL + PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *EXCRETION, URINE + EXPOSURE, SKIN + MAN + LEGISLATION

064768
REINING WC + ALBENESIUS EL
CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT
E.I. DU PONT DE NEMOURS & COMPANY, + SAVANNAH RIVER PLANT, AIKEN, SOUTH CAROLINA
7 PAGES, 13 REFERENCES, 3 TABLES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 24, PAGE 276-283, 1963, (T1782)

SEE NSIC NO. 64766. TRITIUM IS PRODUCED AS AN UNWANTED BYPRODUCT FROM NEUTRON IRRAD OF D2O IN THE REACTORS, AND FROM LI IRRADIATION. NOMOGRAM OF MINUTES TO ASSIMILATE 1 MCI OF HTO VS AIR ACTIVITY IN UCI OF HTO/CC GIVEN FOR DIFFERENT TYPES OF MASK AND SUIT PROTECTION. STACK MONITORS GIVE CONTINUOUS RECORD OF H3 CONCNS. TRITIUM EXPOSURE RECORD AT SAVANNAH AS FOLLOWS - YEAR, NO. OF ASSAYS, H3 UPTAKE BETWEEN 0.37 AND 1.0 MCI, H3 UPTAKE GREATER THAN 1.0 MCI - 1954, 2190, -, 0 - 1955, 2310, -, 2 - 1956, 2230, -, 13 - 1957, 4000, -, 49 - 1958, 3600, 307, 33 - 1959, 2590, 156, 22 - 1960, 2720, 452, 79 - 1961, 2690, 401, 73. AT URINARY H3 CONCNS GREATER THAN 20 UCI/L IN 75 CASES THE BIOL HALF-LIFE AVERAGED 10 DAYS. MAX AVERAGE WEEKLY CONCN OF H3 IN MILK FROM 3 LOCAL DAIRIES AND 2 FARMS WAS 7 X 10 (EXP -6) UCI/CC. MAX AVERAGE WEEKLY CONCN IN DRINKING WATER WAS 13% OF LIMIT SUGGESTED BY ICRP FOR LARGE POPULATIONS. AVERAGE AIR CONCN WAS 0.5 UCI/CC X 10 (EXP -9), WITH WEEKLY MAX OF 6.8, AND RAINWATER AVERAGED 16 X 10 (EXP -6) WITH WEEKLY MAX OF 180. SEE NSIC NOS. 49702, 49713, 56158 FOR ADDNL SAVANNAH RIVER DATA ON TRITIUM.

MPBB + OXIDE + WATER + AIR + MILK + MONITOR, ENVIRONMENTAL + SAVANNAH RIVER PLANT + POPULATION EXPOSURE + *PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *EXCRETION, URINE + MAN + NATURE + EXPOSURE, BACKGROUND

064889
A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS
CONF-701106 +. 18 PAGES, PROCEEDINGS OF THE 5TH ANNUAL HEALTH PHYSICS SOCIETY MIDYEAR SYMPOSIUM, VOLUME II, PG. 266-277, (NOVEMBER 1970)

LABORATORY OPERATIONS AT BROOKHAVEN SINCE ITS ESTABLISHMENT IN 1949 HAVE INCLUDED THE ROUTINE RELEASE TO THE ENVIRONMENT OF GASEOUS, HALOGEN, AIR PARTICULATE, AND H-3 RADIOACTIVITY IN REACTOR AIR EFFLUENTS AND OF BETA-GAMMA EMITTERS AND H-3 IN LOW-LEVEL LIQUID WASTES IN AMOUNTS COMPARABLE TO CURRENT RELEASES FROM POWER REACTORS. PAST AND CURRENT SURVEILLANCE DATA AT BNL HAVE BEEN EVALUATED FOR SHORT- AND LONG-TERM CHANGES IN RADIATION LEVELS ATTRIBUTABLE TO THESE OPERATIONS. *** ON THE BASIS OF THESE DATA, IT IS CONCLUDED THAT FEW CHANGES IN BACKGROUND SHOULD BE APPARENT, EVEN AFTER LONG-TERM OPERATION OF NUCLEAR POWER REACTORS.

EFFLUENT + PARTICLE + BETA EMITTER + *REACTOR, POWER + AIR + *BNL + *RADIOACTIVITY RELEASE + GAMMA EMITTER + GAS + LIQUID + *OPERATING EXPERIENCE + *DATA COLLECTION + *COMPARISON + EXPOSURE, BACKGROUND

065252
MARTER WL + PATTERSON CM
MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT
2 PAGES, AMERICAN NUCLEAR SOCIETY TRANSACTIONS, 14(1), PAGE 162-163, (JUNE 1971)

DETAILS THE VARIOUS METHODS OF MONITORING FOR TRITIUM IN ITS VARIOUS FORMS. POINTS OUT THE DIFFICULTIES OF CONTINUOUS MONITORING FOR LOW TRITIUM OXIDE CONCENTRATIONS. THE SAVANNAH RIVER PLANT IS A PRODUCER OF TRITIUM, AND CONSEQUENTLY THE MONITORING OF TRITIUM IN GASES, LIQUIDS, AND

065252 *CONTINUED*
OTHER ENVIRONMENTAL MEDIA HAS BEEN OF PRIME IMPORTANCE SINCE STARTUP IN THE 1950S.

*MONITOR, LIQUID + MONITOR, STACK + *MONITOR, AIR + *MONITOR, GAS + *MONITOR, ENVIRONMENTAL + SAVANNAH RIVER PLANT + RADIATION MONITORS

065472
SMITH JM + GILBERT RS
TRITIUM EXPERIENCE IN BOILING WATER REACTORS
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
2 PAGES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 14(1), PAGES 160-161 (1971)

DUE TO THE LOW TRITIUM CONCENTRATIONS IN A BWR, KNOWLEDGE OF THE RELATIVE CONTRIBUTIONS FROM THE VARIOUS SOURCES THAT APPEAR IN REACTOR WATER IS GAINED ONLY BY INFERENCE. AUDIT OF 1970 OPERATIONS AT OYSTER CREEK INDICATED ABOUT 22 CI OF TRITIUM IN LIQUID EFFLUENTS. BASED ON OPERATING HISTORY, THE SOURCES ARE ESTIMATED TO BE 4 CI FROM DEUTERIUM IN REACTOR WATER, 6000 CI IN FUEL FROM FISSION, AND 2000 CI IN CONTROL MATERIAL, DURING THE YEAR. BY INFERENCE, IT APPEARS THAT ONLY A FEW-TENTHS OF ONE PERCENT OF THE COMBINED FISSION AND CONTROL MATERIAL SOURCE IS TRANSFERRING TO REACTOR WATER. THIS EXPERIENCE INDICATES THAT OPERATION OF LARGE BOILING WATER REACTORS WILL CONTINUE TO PRODUCE INSIGNIFICANT RADIATION EXPOSURES FROM TRITIUM, BOTH IN PLANT AND IN THE ENVIRONS.

AVAILABILITY - JAMES M. SMITH, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

*REACTOR, BWR + *PRODUCTION

065953
WRIGHT JH
ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS
4 PAGES, J. INST. NUCL. ENG., 12, PAGE 8-12, (JAN-FEB. 1971)

RADIATION EFFECTS EVEN IN A REGION CONTAINING NUCLEAR PLANTS ON 32-KM CENTER TO CENTER LOCATIONS ARE STILL QUITE NEGLIGIBLE. INFORMATION ON THE RADIONUCLIDE RELEASE IN LIQUID AND GASEOUS EFFLUENTS SHOULD BE COLLECTED TO ASSESS THE FUTURE ENVIRONMENTAL RADIONUCLIDE DISTRIBUTION, ALTHOUGH THERE IS NO SHORT RANGE PROBLEM FROM BUILD-UP IN THE BIOSPHERE. THE MANAGEMENT OF KRYPTON AND TRITIUM SHOULD BE MODIFIED WITHIN THE NEXT TWO DECADES.

*KRYPTON + REACTOR, PWR + RADIATION IN PERSPECTIVE + WASTE DISPOSAL, ATMOSPHERIC + *BIOTA + WASTE DISPOSAL, RIVER + *RADIONUCLIDE UPTAKE + N-POWER FORECAST

066237
MEGERTH FH
ZIRCALOY-CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT 13, NOV. 1970 TO MAR. 1971
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
GEAP-10363 +. 26 PAGES, 5 REFERENCES, 12 FIGURES, 5 TABLES, AUGUST 1970

PROGRESS REPORT ON STUDY OF PERFORMANCE OF SA-1 FUEL RODS (ZIRCALOY-2 CLADDING, UO2 FUEL). DESCRIBES EXAMINATIONS AND ANALYSES OF THE RODS (GAMMA SCANNING, DIAMETRAL MEASUREMENTS, EXAMINATION OF DE-CRUDDED RODS, NEUTRON RADIOGRAPHY OF RODS, GAS COLLECTION, AND ANALYSIS OF CLADDING FOR TRITIUM).

AVAILABILITY - F. H. MEGERTH, GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA

CLADDING + FISSION GAS RELEASE + *FUEL BURNUP + FLAW + CRUD + ZIRCALOY + *EXAMINATION + SURFACE FILM DEPOSIT + EXPANSION + *FUEL ROD

068766
REPORT ON RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE, WASHINGTON, D.C.
9 PAGES, 4 TABLES, OCTOBER 1971

TABULATES RADIOACTIVITY RELEASED IN LIQUID AND GASEOUS EFFLUENTS FROM NUCLEAR POWER PLANTS DURING 1970. NEW REACTORS WITH CAPACITY FACTORS OF LESS THAN 10% FOR 1970 WERE EXCLUDED. REVIEWS OF SAMPLING AND ANALYTICAL METHODS USED AT SOME FACILITIES WERE INAPPROPRIATE TO MEASURE TOTAL ACTIVITY. CORRECTIONS WERE MADE. THEREFORE SOME DATA ARE DIFFERENT FROM THOSE REPORTED BY THE UTILITIES. RADIOACTIVITY IN EFFLUENT RELEASES HAS BEEN GENERALLY LOW IN COMPARISON WITH PERMISSIBLE LIMITS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

REACTOR, BWR + FISSION GAS RELEASE + FISSION PRODUCT RELEASE + REACTOR, PWR + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + *RADIOACTIVITY RELEASE + REACTOR, HTGR

069850
MAWSON CA
CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS

069850 *CONTINUED*
DIVISION - ENVIRONMENTAL RESEARCH BRANCH (P. 29-41)
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES
AECL-4075 +. 13 PAGES, PP. 29-41, DECEMBER 1971

THE TOPICS REPORTED INCLUDE - MONITORING, RELEASE OF TRITIUM TO THE OTTAWA RIVER (1.5-14 CI/DAY), AND GAMMA SPECTRASCOPY OF NEUTRON-CAPTURE PRODUCTS IN RIVER WATER. CA/SR METABOLISM IN FISH WAS STUDIED BY DOUBLE TRACERS (SR-85/CA-47), AND EQUIPMENT WAS INSTALLED FOR SIMULATING PESTICIDE CONTAMINATION. SEDIMENT CORES WERE ANALYZED FOR TOTAL AND EXCHANGEABLE FRACTIONS OF STABLE AND RADIOSTRONTIUM. ANALYTICAL TECHNIQUE DEVELOPMENT INCLUDED CONCENTRATION OF WATER FOR TRACE-ELEMENT ANALYSIS, NEUTRON ACTIVATION ANALYSIS, LOW-BACKGROUND BETA COUNTING. TRITIUM AND DEUTERIUM TRACERS WERE USED IN STUDIES OF THE WATER BALANCE OF LAKES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVATION + CALCIUM + CERIUM + COBALT + DEUTERIUM + RIVER + STRONTIUM + *SURVEY, ENVIRONMENT + TRACER, RADIOACTIVE + MANGANESE + RIVER, OTTAWA + SURFACE WATER, NUCLIDE OCCURRENCE + ANALYTICAL TECHNIQUE + CHALK RIVER + NEUTRON + SCANDIUM + LAKE + AECL + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + BIOACCUMULATION/TURNOVER + *ECOSYSTEM, AQUATIC + PHYSIOLOGY/METABOLISM + PESTICIDE

069957
JANSSEN L
NUCLEAR POWER PLANT EMISSIONS
5 PAGES, MITT. VER. GROSSKESSELBETR, 51(2): 143-7 (1971) (IN GERMAN)

THE BASIS FOR, AND DEVELOPMENT OF STATUTORY LIMITATIONS FOR THE RELEASE OF RADIOACTIVE EMISSIONS FROM NUCLEAR POWER PLANTS ARE DISCUSSED. THE ACTUAL EMISSION VALUES FOUND UNDER NORMAL CONDITIONS AND DURING EMERGENCIES ARE GIVEN. TRITIUM EMISSION IS USED TO ILLUSTRATE THE NEED FOR TRACING EMITTED RADIOACTIVE SUBSTANCES SO THAT POSSIBLE BIOLOGICAL ACCUMULATION CAN BE RECOGNIZED. (IN GERMAN)

*REACTOR, POWER + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RADIOACTIVITY RELEASE

072076
GROSSMAN LN + HEGLAND JO
TRITIUM DISTRIBUTION IN HIGH POWER ZIRCALOY FUEL ELEMENTS
GENERAL ELECTRIC COMPANY, PLEASANTON, CALIFORNIA
GEAP-12205 +. 42 PAGES, FIGURES, TABLES, REFERENCES, JUNE 1971

TRITIUM WAS DISTRIBUTED NONUNIFORMLY IN THE CLADDING; HYDROGEN, FROM GENERAL CORROSION WAS UNIFORMLY DISTRIBUTED. THERMAL DIFFUSION OF TRITIUM TOWARD FUEL-FREE REGIONS WAS INDICATED IN THE CLADDING OF ROD 12FV, WHICH WAS IRRADIATED IN A PRESURIZED WATER LOOP WITH LARGER LINEAL THERMAL GRADIENTS ALONG THE CLADDING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING + FUEL BURNUP + *FISSION PRODUCT TRANSPORT + ZIRCALOY

073286
COCHRAN JA + GRIFFIN WR + TROIANELLO EJ
CHARACTERIZATION OF TRITIUM STACK EFFLUENT FROM A FUEL REPROCESSING PLANT
ENVIRONMENTAL PROTECTION AGENCY, MASSACHUSETTS
1 PAGE, 7 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 15(1) P. 79 (JUNE 1972)

A STUDY TO DETERMINE THE NATURE OF STACK TRITIUM RELEASE AND DEVELOP A SAMPLING METHOD FOR OBTAINING TRITIUM AIR CONCENTRATIONS AT THE STACK AND IN THE ENVIRONS OF A NUCLEAR FUEL REPROCESSING PLANT. THE STUDY WAS CARRIED OUT AT NUCLEAR FUEL SERVICES, INC. THE STUDY WAS DESIGNED TO (A) CHARACTERIZE THE STACK TRITIUM EFFLUENT IN THE GASEOUS AND WATER VAPOR FORMS, DURING NORMAL PLANT OPERATIONS, (B) DETERMINE THE WEEKLY AVERAGE TRITIUM AIR CONCENTRATIONS AT FIVE SELECTED SITES OVER A FOUR-MONTH PERIOD, AND (C) EVALUATE METHODS USED FOR SAMPLING AT THE STACK AND IN THE ENVIRONMENT.

AVAILABILITY - JOSEPH A. COCHRAN, FIELD OPERATIONS BRANCH, DIVISION OF SURVEILLANCE AND INSPECTION, OFFICE OF RADIATION PROGRAMS, ENVIRONMENTAL PROTECTION AGENCY, 109 HOLLON STREET, WINCHESTER, MASSACHUSETTS 01890

*EFFLUENT + *MONITOR, STACK + *SAMPLING + AIR + *RADIOACTIVITY RELEASE + FUEL REPROCESSING + *MONITOR, AREA + CONCENTRATION

074952
HOLLIDAY JN
REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT
GENERAL ELECTRIC COMPANY, ST. PETERSBURG, FLORIDA
CONF-721030 +. 10 PAGES, 1 FIGURE, PP. 393-402, PAPER PRESENTED AT THE AEC POLLUTION CONTROL CONFERENCE, HELD IN OAK RIDGE, TENN. ON OCTOBER 25, 1972

REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENT AT THE PINELLAS PLANT IS ATTRIBUTED TO A PROCEDURE CHANGE AND THE OPERATION OF A HYDROGEN OXIDIZING-COLLECTION SYSTEM. THE OXIDIZING-COLLECTION SYSTEM IN USE AT PINELLAS IS DESCRIBED. IT IS SUGGESTED THAT SUCH A SYSTEM, PROPERLY DESIGNED, COULD EFFECT SIMILAR REDUCTIONS AT OTHER LOCATIONS.

074952 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT + *WASTE TREATMENT + STACK + *WASTE MANAGEMENT

075362
KIRCHMANN R + CANTILLON G
BEHAVIOR IN RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR POWER PLANTS
MOL, DEPARTMENT OF RADIOBIOLOGY + INSTITUTE OF HEALTH, BRUSSELS
17 PAGES, 8 TABLES, 2 REFERENCES, PRESENTED AT THE COMMISSION OF THE COMMUNITIES INTERNATIONAL SYMPOSIUM ON RADIOECOLOGY, APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT, ROME, SEPTEMBER 1971

DURING PERIODS OF EFFLUENT RELEASE FROM THE ARDENNES NUCLEAR POWERPLANT, DOWNSTREAM EFFECTS WERE STUDIED. TRITIATED-WATER CONCENTRATION IN RIVER WATER REACHED ABOUT 1500 PICOCURIES/LITER; CO AND MN RADIONUCLIDES, ABOUT 10 PICOCURIES/LITER. FIELD AND LABORATORY STUDIES GAVE FIXATION OF MN AND CO BY SEDIMENTS OF FROM 0.7 TO 2%. CO AND MN CONCENTRATION FACTORS FOR SEDIMENT (IN SUSPENSION) WERE AS HIGH AS ABOUT 30,000; FOR A SPECIES OF AQUATIC MOSS, ABOUT 600.

AVAILABILITY - OFFICE FOR OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES, P.O.B. 1003, LUXEMBOURG 1

COBALT + MANGANESE + *WASTE DISPOSAL, RIVER + ANALYTICAL TECHNIQUE + CRITICAL NUCLIDE PATHWAY + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + RADIONUCLIDE TRANSFER + AQUATIC ORGANISM + *SEDIMENT + LABORATORY EXPERIMENT + FIELD EXPERIMENT + CONCENTRATION FACTOR + PLANT, MOSS/FERN

075040
SEMIANNUAL RADIOACTIVITY RELEASES FROM INDIAN POINT 1
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
DOCKET-50003-126 +. 3 PAGES, LETTER - CONSOLIDATED EDISON COMPANY OF NEW YORK TO DIRECTORATE OF LICENSING (AEC) - AUGUST 31, 1972, DOCKET 50-3, TYPE--PWR, MFG--B+W, AE--CON ED

DETAILS LIQUID AND GASEOUS RADIOACTIVITY RELEASE BY ISOTOPES FOR 6-MONTH PERIOD. LIQUID RELEASES WERE - 22 CI BETA-GAMMA AND 262 CI TRITIUM; NOBLE-GAS RELEASE WAS 90.2 CI.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ELEMENTS AND ISOTOPES + *INDIAN POINT 1 (PWR) + *REPORT, OPERATIONS + REACTOR, PWR + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + *RADIOACTIVITY RELEASE

075295
BARRY PJ + MARKO AM + OPHEL IL + WILSON R
SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA
CHALK RIVER NUCLEAR LABORATORIES, ONTARIO
AECL-4165 +. 82 PAGES, 3 FIGURES, 14 TABLES, 22 REFERENCES, APRIL 1972

EIGHT PAPERS AND TALKS ARE INCLUDED, SOME OF WHICH WERE PUBLISHED PREVIOUSLY. TOPICS INCLUDE NUCLEAR WASTES, BIOLOGICAL UPTAKE, DOSE LIMITS, AND AMOUNTS OF RADIOACTIVITY RELEASED FROM 3 REACTORS DURING 1967-1971. THE CLOSED CYCLES USED TO REDUCE HEAVY-WATER LOSSES REDUCE ESCAPE OF GASEOUS RADIOISOTOPES. MOLECULAR SIEVE DRIERS REMOVE BOTH HEAVY WATER AND TRITIATED WATER, AND PROVIDE DELAY IN THE RELEASE OF NOBLE-GAS RADIOISOTOPES. WHETHER IODINE IS RETAINED IS NOT YET KNOWN.

CANADA + DOSE + IODINE + MOLECULAR SIEVE + NOBLE GAS + RELEASE RATE + *WASTE TREATMENT + CRITICAL NUCLIDE PATHWAY + ENVIRONMENT + *CONTAINMENT LEAKAGE CONTROL + THERMAL POLLUTION + ABSORPTION + *RADIONUCLIDE UPTAKE + FOOD CHAIN + DRY

077129
MATUSZEK JM + KUNZ CR + PAPERIELLO CJ
CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES
NEW YORK STATE DEPARTMENT OF HEALTH
PAPER NO. 22 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (SEE CONF-730603--)

THE RADIOLOGICAL SCIENCES LABORATORY OF THE NEW YORK STATE DEPARTMENT OF HEALTH IS CONDUCTING A STUDY TO CHARACTERIZE THE GASEOUS RADIOACTIVE EFFLUENTS FROM NUCLEAR FACILITIES. AT THIS TIME, HOLD-UP TANK, COVER-GAS, STRIP-GAS AND STACK EFFLUENT SAMPLES FROM TWO PWR'S, A BWR AND A GAS-COOLED REACTOR HAVE BEEN ANALYZED. GASEOUS SPECIES ARE CHROMATOGRAPHICALLY SEPARATED, THEN COUNTED IN GAS PROPORTIONAL COUNTING SYSTEMS. SPECTROMETRIC MEASUREMENTS HAVE RESULTED IN THE IDENTIFICATION AND QUANTIFICATION OF H-3 (AS HYDROGEN GAS, WATER AND METHANE), C-14 (AS METHANE AND CARBON DIOXIDE), RADIOARGON, RADIOKRYPTON, RADIOXENON AND RADIOIODINE. EXPERIENCE IN SAMPLE COLLECTION, HANDLING, AND ANALYSIS ARE DISCUSSED WITH REGARD TO APPENDIX I REQUIREMENTS, PARTICULARLY WITH REGARD TO REPORTING REQUIREMENTS IMPOSED BY SAFETY GUIDE 21.

AVAILABILITY - JOHN M. MATUSZEK, NEW YORK STATE DEPARTMENT OF HEALTH, ALBANY, NEW YORK 12201

CARBON + *EFFLUENT + *CHROMATOGRAPHY + IODINE + KRYPTON + MPC + REGULATION + XENON + ARGON + *MONITOR, GAS + *ANALYTICAL TECHNIQUE + *RADIOLYTIC GAS + *GAS + *SPECTROMETRY + *POWER PLANT, NUCLEAR + NRC REGULATORY GUIDE

080212
COCHRAN JA + GRIFFIN WR + TROIANELLO EJ
OBSERVATION OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING PLANT
U.S. ENVIRONMENTAL PROTECTION AGENCY
EPA/ORP 73-1 +. 28 PAGES, 11 TABLES, 2 FIGURES, 15 REFERENCES, FEBRUARY 1973

A STUDY WAS CONDUCTED AT NUCLEAR FUEL SERVICES, INC. (NFS) TO (A) CHARACTERIZE THE STACK TRITIUM EFFLUENT IN THE GASEOUS AND WATER VAPOR FORMS, DURING NORMAL PLANT OPERATIONS, (B) DETERMINE THE WEEKLY AVERAGE TRITIUM AIR CONCENTRATIONS AT FIVE SELECTED SITES AROUND THE PLANT OVER A 4-MONTH PERIOD, (C) EVALUATE METHODS USED FOR SAMPLING AT THE STACK AND IN THE ENVIRONMENT, AND (D) ESTIMATE THE DOSE TO THE POPULATION IN THE IMMEDIATE VICINITY OF THE PLANT FROM TRITIUM STACK EFFLUENTS. DATA FOR THE FIVE AIR SAMPLING STATIONS AROUND THE SITE INDICATE THAT THE PLANT CONTRIBUTION TO THE ATMOSPHERE IS SMALL.

AVAILABILITY - U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, FIELD OPERATIONS DIVISION, WASHINGTON, D.C. 20460

DOSE + EFFLUENT + *ATMOSPHERIC POLLUTION + MONITOR, AIR + MONITOR, GAS + MONITOR, SAMPLING + *STACK + POPULATION EXPOSURE + *RADIOACTIVITY RELEASE + *WATER VAPOR + *FUEL REPROCESSING + *GAS + CONCENTRATION

080704
PEURA EWA
TECHNICAL EVALUATION OF THE PM-1 NUCLEAR POWER PLANT AND RELATED PROGRAMS
U.S. ARMY ENGINEER REACTOR GROUP, CORPS OF ENGINEERS
AD 686341 +. 79 PAGES, 93 REFERENCES, DECEMBER 1968

THIS REPORT PRESENTS A TECHNICAL EVALUATION OF THE PM-1 NUCLEAR POWER PLANT AND RELATED PROGRAMS. THE DATA PRESENTED IN THIS REPORT WAS DERIVED FROM THE REPORTS REFERENCED AND THE AUTHOR'S EXPERIENCE IN THE PM-1 PROJECT ENGINEER'S OFFICE, UNITED STATES ARMY ENGINEER REACTORS GROUP (MAY 1964-DEC. 1968). CONCLUSIONS DEALING WITH THE PM-1 ACCOMPLISHMENTS AND THE LAND BASED NUCLEAR POWER PROGRAM ARE PRESENTED. RECOMMENDATIONS FOR FUTURE NUCLEAR POWER PROGRAM EFFORT ARE TABULATED.

AVAILABILITY - U.S. ARMY ENGINEER REACTORS GROUP, ENGINEERING DIVISION, CORPS OF ENGINEERS, FT. BELVOIR, VA. 22060

DESIGN CRITERIA + *HYDROGEN + OPERATING EXPERIENCE SUMMARY + *REACTOR, MILITARY + OPERATING EXPERIENCE

080977
STOEVER D
DETERMINATION OF THE RELEASE BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO COMPACTS
INSTITUT FUER REAKTORENTWICKLUNG, WEST GERMANY
JUL-863-RG +. 142 PAGES, FIGURES, TABLES, JUNE 1972

THIS REPORT REFERS TO POST-IRRADIATION INVESTIGATIONS ON NEUTRON-IRRADIATED SINTERED BEO COMPACTS. THE MACROSCOPIC-MECHANICAL PROPERTIES OF THE SAMPLES SUCH AS DENSITY, POROSITY, AND YOUNG'S MODULUS IS DISCUSSED AS WELL AS THE RADIATION DAMAGE OF BOTH COMPOSITION AND LATTICE STRUCTURE. BY MEANS OF A SPECIALLY DEVELOPED VACUUM ASSEMBLY, THE RELEASE BEHAVIOR OF HELIUM WAS STUDIED BOTH ISOTHERMAL AND WITH A VARYING FUNCTION OF TEMPERATURE AND TIME. AN ABSOLUTE DETERMINATION OF THE TOTAL CONTENTS OF HELIUM AND TRITIUM IN THE SAMPLES IS ACHIEVED BY A CHEMICAL ANALYSIS. THE RESULTS ARE DISCUSSED, AND THEY ARE DESCRIBED QUANTITATIVELY BY THE APPLICATION OF A MODIFIED DIFFUSION THEORY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BERYLLIUM + OXIDE + HELIUM + IN PILE EXPERIMENT + RADIONUCLIDE, INDUCED

081882
YANKEE ROWE OPERATION REPORT FOR APRIL 1973
YANKEE ATOMIC ELECTRIC CO.
10 PAGES, OPERATION REPORT NO. 148, APRIL 1973, DOCKET 50-29, TYPE-OPWR, MFG--WEST., AE--STONE & WEBSTER

THE CORE-X MOL MAINTENANCE OUTAGE WAS COMPLETED AND THE REACTOR PHYSICS TESTING STARTED ON APRIL 1. TOTAL TIME FOR THE OUTAGE WAS 171.9 DAYS. WITH THE REACTOR IN COLD SHUTDOWN, A CONTRACTOR'S EMPLOYEE OPENED THE VAPOR CONTAINER PERSONNEL HATCH OUTER DOOR WITH THE INNER DOOR ALREADY OPEN. DURING THE 2 MIN THAT CONTAINMENT WAS VIOLATED, AN INADVERTENT RELEASE OF TRITIUM AS VAPOR OCCURRED, RELEASING AN ESTIMATED 82.3 MICROCURIES FROM THE VAPOR CONTAINER.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + FAILURE, OPERATOR ERROR + *REPORT, OPERATIONS + REACTOR, PWR + TESTING + *YANKEE ROWE (PWR) + REFUELING + RADIOACTIVITY RELEASE + REACTOR PHYSICS + OPERATING EXPERIENCE

082815
RADIOACTIVE EFFLUENTS FROM NUCLEAR POWER STATION IN THE (EUROPEAN) COMMUNITY-DISCHARGE DATA RADIOLOGICAL ASPECTS
COMMISSION OF THE EUROPEAN COMMUNITIES

082815 *CONTINUED*
33 PAGES, 12 TABLES, 20 REFERENCES, NOVEMBER 1972

ASSEMBLES LITERATURE DATA FOR 1969, 1970, 1971 ON RADIOACTIVE WASTE DISCHARGES. IN THE CASE OF GASEOUS EFFLUENTS A DISTINCTION IS DRAWN BETWEEN NOBLE GASES, AEROSOLS, AND IODINE-131; AND IN THE CASE OF LIQUID EFFLUENTS, BETWEEN THE TOTAL ACTIVITY (EXCLUDING TRITIUM) AND TRITIUM ALONE. THE DISCHARGE DATA ARE COMPARED WITH THE DISCHARGE LIMITS FOR THE VARIOUS POWER STATIONS. FOR THE LIQUID EFFLUENTS, THE AVERAGE YEARLY CONCENTRATIONS REACHED IN THE RECEIVING WATERBODIES ARE SHOWN, EXPRESSED AS A PERCENTAGE OF THE MAXIMUM PERMISSIBLE CONCENTRATION IN DRINKING WATER. AN EVALUATION IS MADE OF THE MAXIMUM EXPOSURE AROUND EACH PLANT SITE AND THIS EXPOSURE IS COMPARED WITH THE RADIOLOGICAL PROTECTION STANDARDS IN FORCE AND WITH THE NATURAL RADIATION BACKGROUND. FOR EACH STATION THE RATIO OF ACTIVITY DISCHARGED TO ENERGY PRODUCED IS GIVEN.

AVAILABILITY - COMMISSION OF THE EUROPEAN COMMUNITIES, DIRECTORATE GENERAL OF SOCIAL AFFAIRS, DIRECTORATE FOR HEALTH AND SAFETY, DG V/F/2, 29, RUE ALDRINGEN, LUXEMBOURG (GRAND DUCHY OF LUXEMBOURG)

REACTOR, BWR + *EFFLUENT + FISSION PRODUCT RELEASE + FISSION PRODUCT, IODINE + FRANCE + REACTOR, GCR + IODINE + REACTOR, PWR + REACTOR, POWER + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + GERMANY + ITALY + NETHERLANDS + *RADIOACTIVITY RELEASE + DISCHARGE

094095
OATES WH
RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION
U.S. DEPT. OF HEALTH, EDUCATION, AND WELFARE; BUREAU OF RADIOLOGICAL HEALTH
BRH/DCS 70-1 +. 29 PAGES, 7 TABLES, 43 REFERENCES, JANUARY 1970

WHILE NUCLEAR POWER REACTORS CONTAIN LARGE INVENTORIES OF RADIOACTIVE MATERIALS, THE EFFLUENT DISCHARGE DATA INDICATE THAT THEY DISCHARGE ONLY SMALL QUANTITIES OF RADIOACTIVE WASTES IN COMPARISON TO THEIR LICENSED LIMITS UNDER NORMAL OPERATING CONDITIONS. THIS SITUATION IS A RESULT OF CAREFUL WASTE MANAGEMENT PRACTICE, ENGINEERED SAFEGUARDS, AND PROPER OPERATING PROCEDURES. ONLY TRITIUM AND INERT GASES DO NOT RESPOND TO CONVENTIONAL WASTE TREATMENT PROCESSES AND THEREFORE ARE USUALLY THE ONLY RADIONUCLIDES THAT ARE DISCHARGED IN ANY SIGNIFICANT QUANTITIES. THESE RADIONUCLIDES HAVE BEEN DISCHARGED, HOWEVER, AT RATES WELL BELOW THOSE SPECIFIED BY THE AEC.

AVAILABILITY - U.S. DEPT. OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, ENVIRONMENTAL CONTROL ADMINISTRATION, BUREAU OF RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND 20852

*DOSE + *EFFLUENT + FISSION PRODUCT RELEASE + NOBLE GAS + *WASTE MANAGEMENT + *POWER PLANT, NUCLEAR + JACOBS

099295
AUSTIN JH + ELLEMAN TS + VERGHESE K
SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-STAINLESS STEEL AND ZIRCALOY-2
NORTH CAROLINA STATE UNIVERISTY, RALEIGH
10 PAGES, 8 FIGURES, 16 REFERENCES, J. NUCLEAR MATERIALS, 48(3), PP. 307-316 (OCTOBER 1973)

TRITIUM DIFFUSION MEASUREMENTS FOLLOWING TRITIUM RECOIL INJECTION INTO AUSTENITIC STAINLESS STEELS AND ZIRCALOY-2 EXHIBIT SLOWER HYDROGEN TRANSPORT IN THE SURFACE REGIONS THAN IN THE BULK. KINETICS OF TRITIUM RELEASE FROM THESE MATERIALS INDICATE THAT THE RELEASE IS CONTROLLED BY A DIFFUSION COEFFICIENT THAT IS TWO TO THREE ORDERS OF MAGNITUDE LOWER THAN THE BULK DIFFUSION COEFFICIENT FOR TRITIUM IN STAINLESS STEEL AND SEVEN TO EIGHT ORDERS OF MAGNITUDE LOWER IN ZIRCALOY-2. A TWO-REGION CLASSICAL DIFFUSION MODEL WITH DIFFERENT DIFFUSION COEFFICIENTS IN EACH REGION HAS BEEN DEVELOPED WHICH APPEARS TO ADEQUATELY REPRESENT THE SURFACE DATA FOR SHORT HEATING TIMES. RELEASE RATES AT LONG HEATING TIMES ARE APPARENTLY INFLUENCED BY TRAPPING OF HYDROGEN IN SURFACE FILMS. THE SURFACE EFFECTS ARE SHOWN NOT TO BE DUE TO THE HELIUM WHICH IS INJECTED INTO THE SPECIMENS ALONG WITH THE TRITIUM.

DIFFUSION + HYDROGEN + ANALYTICAL MODEL + STEEL, STAINLESS + ZIRCALOY

099746
SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS
WESTINGHOUSE ELECTRIC CORP., PA.
WCAP-8253 +. 207 PAGES, JUNE 11, 1974

THIS IS A COMPILATION OF OPERATING PLANT DATA THROUGH JUNE 1973 WHICH IS APPLICABLE TO THE EVALUATION OF PWR RADWASTE TREATMENT SYSTEMS AND THE CALCULATION OF RADIOACTIVE EFFLUENT SOURCE TERMS. CONCENTRATIONS OF FISSION AND CORROSION PRODUCTS IN THE RCS, IODINE SEPARATION FACTOR, PRIMARY TO SECONDARY LEAK RATES, AND TRITIUM RELEASE DATA FROM OPERATING WESTINGHOUSE PWR'S ARE PRESENTED. AN EXPECTED I-131 CONCENTRATION MODEL HAS BEEN DEVELOPED WHICH IS OFFERED AS A REPLACEMENT FOR THE INFERRED FUEL DEFECT MODEL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DESIGN CRITERIA + EFFLUENT + FISSION PRODUCT, IODINE + *REACTOR, PWR + RELEASE RATE + *WASTE TREATMENT + ANALYTICAL MODEL + REACTOR COOLANT + CORROSION + FISSION PRODUCT ACTIVITY, GROSS + OPERATING EXPERIENCE + RADIATION SOURCE, INTERNAL + WESTINGHOUSE

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

ABSORPTION
002551 P 1 075295 P 23
ACCELERATOR
033070 P 8 057294 P 18
ACCIDENT
031445 P 7
ACCIDENT, COLD COOLANT
030208 P 7
ACCIDENT, REACTIVITY
043843 P 15
ACTIVATION
069850 P 21
ACTIVITY BUILDUP
037466 P 8 038081 P 9 039078 P 10 039079 P 10
ADMINISTRATIVE CONTROL
006456 P 2 048572 P 16
ADSORPTION
021995 P 6 043090 P 14
AECL
052042 P 17 069850 P 21
AEROSOL
057294 P 18
AEROSOL PROPERTIES
057294 P 18
AEROSOL, RADIOACTIVE
031445 P 7
AIR
052042 P 17 055992 P 18 064768 P 20 064889 P 20
073286 P 22
AIRBORNE RELEASE
017118 P 5 027838 P 6 030208 P 7 038740 P 9
039045 P 10 039078 P 10 081882 P 24
ANALYTICAL MODEL
099295 P 25 099746 P 25
ANALYTICAL TECHNIQUE
027977 P 7 069850 P 21 075362 P 23 077129 P 23
ANIMAL, FISH
055992 P 18 069850 P 21
ANIMAL, VERTEBRATE
064725 P 20 064768 P 20
AQUATIC ORGANISM
075362 P 23
ARGON
006242 P 2 041979 P 13 077129 P 23
ATMOSPHERIC POLLUTION
031445 P 7 043989 P 16 080212 P 24
BATTELLE NORTHWEST
007122 P 2
BATTERIES & CHARGERS
039078 P 10
BERYLLIUM
080977 P 24
BETA EMITTER
038276 P 9 039217 P 11 039231 P 11 040701 P 12
064889 P 20
BIG ROCK POINT (BWR)
043985 P 16 048572 P 16
BIOACCUMULATION/TURNOVER
069850 P 21 075362 P 23
BIOMEDICAL
021995 P 6 057294 P 18
BIOTA
065953 P 21
BNL
064889 P 20
BODY FLUID
043306 P 15
BONUS (ISR)
043985 P 16
BORON
039045 P 10 047843 P 16
BURNOUT HEAT FLUX
006456 P 2
CALCIUM
069850 P 21
CANADA
003269 P 1 011919 P 3 017335 P 5 021995 P 6
064725 P 20 075295 P 23
CARBON
077129 P 23
CERIUM
051297 P 17 069850 P 21
CESIUM
038081 P 9 051297 P 17 058861 P 18
CHALK RIVER
021995 P 6 027860 P 6 069850 P 21
CHAMBER, ION
031445 P 7 033310 P 8
CHEMICAL SHIM
037466 P 8
CHROMATOGRAPHY
077129 P 23
CHROMIUM
051297 P 17
CLADDING
047843 P 16 061489 P 19 066237 P 21 072076 P 22
COBALT
051297 P 17 069850 P 21 075362 P 23
CODES AND STANDARDS
043985 P 16 064725 P 20
COMPARISON
048572 P 16 064889 P 20
COMPLIANCE
017118 P 5
COMPUTER CONTROL
040005 P 12
COMPUTER PROGRAM
014734 P 4
COMPUTER, DIGITAL
014734 P 4
CONCENTRATION
002551 P 1 006242 P 2 027860 P 6 027977 P 7
043090 P 14 055028 P 17 058861 P 18 073286 P 22
080212 P 24
CONCENTRATION FACTOR
075362 P 23
CONGRESSIONAL ACTIVITY
043985 P 16 043989 P 16
CONNECTICUT YANKEE (PWR)
030208 P 7 036295 P 8 038276 P 9 039045 P 10
039217 P 11 039231 P 11 040701 P 12 041962 P 13
043172 P 14 048572 P 16 063294 P 19
CONSTRUCTION PERMIT PROCESS
043847 P 15
CONSUMER PRODUCT
002551 P 1 055112 P 17
CONTAINMENT
043571 P 15
CONTAINMENT INTEGRITY
041979 P 13
CONTAINMENT LEAKAGE CONTROL
075295 P 23
CONTAINMENT, HIGH PRESSURE
027838 P 6 030208 P 7
CONTAMINATION
010200 P 3 031445 P 7 033070 P 8 033310 P 8
039231 P 11 055112 P 17
CONTROL RODS
038741 P 10 039045 P 10 043847 P 15
CONTROL SYSTEM
043843 P 15
COOLANT CHEMISTRY
037466 P 8 040046 P 12 062663 P 19
CORROSION
099746 P 25
COUNTER
040046 P 12
CRITICAL NUCLIDE PATHWAY
075295 P 23 075362 P 23
CRUD
061489 P 19 066237 P 21
CVTR (PWR)
023868 P 6
DAMAGE
039079 P 10
DATA COLLECTION
048572 P 16 064889 P 20
DECONTAMINATION
047843 P 16
DEPOSITION
043306 P 15
DESIGN CRITERIA

080704 P 24 099746 P 25
DEUTERIUM
006242 P 2 040046 P 12 043843 P 15 069850 P 21
DIFFUSION
004414 P 2 047843 P 16 099295 P 25
DILUTION
052042 P 17
DISCHARGE
082815 P 24
DNB
036295 P 8
DOSE
002551 P 1 017335 P 5 021995 P 6 055992 P 18
075295 P 23 080212 P 24 094095 P 25
DOSE CALCULATION, EXTERNAL
002551 P 1 017335 P 5 055028 P 17
DOSE CALCULATION, INTERNAL
017335 P 5 021995 P 6 064725 P 20
DOSE MEASUREMENT, EXTERNAL
011919 P 3 055028 P 17 055112 P 17
DOSIMETRY
002551 P 1 027860 P 6
DRAGON (HTGR)
062663 P 19
DRESDEN 1 (BWR)
043985 P 16 048572 P 16
DRY
075295 P 23
ECOSYSTEM, AQUATIC
069850 P 21
EFFECT
051297 P 17
EFFLUENT
006242 P 2 043571 P 15 048572 P 16 055028 P 17
061410 P 19 064889 P 20 073286 P 22 074952 P 22
077129 P 23 080212 P 24 082815 P 24 094095 P 25
099746 P 25
ELECTRICAL CONDUCTION
039078 P 10
ELEMENTS AND ISOTOPES
004414 P 2 075040 P 23
ELK RIVER (BWR)
016929 P 5 043571 P 15 043985 P 16
ENERGY LEVEL
033070 P 8
ENVIRONMENT
043989 P 16 047843 P 16 048572 P 16 051297 P 17
075295 P 23
EXAMINATION
038121 P 9 061489 P 19 066237 P 21
EXCRETION, URINE
027977 P 7 043306 P 15 064725 P 20 064768 P 20
EXPANSION
061489 P 19 066237 P 21
EXPOSURE, BACKGROUND
064768 P 20 064889 P 20
EXPOSURE, SKIN
064725 P 20
FABRICATION
062663 P 19
FAILURE, ADMINISTRATIVE CONTROL
010200 P 3 010561 P 3 013446 P 4 015084 P 5
017118 P 5
FAILURE, CLADDING
063294 P 19
FAILURE, COMPONENT
030208 P 7
FAILURE, DESIGN ERROR
015084 P 5 038741 P 10
FAILURE, EQUIPMENT
015083 P 5 041165 P 12 042745 P 14 058166 P 18
FAILURE, FUEL ELEMENT
023868 P 6
FAILURE, INSTRUMENT
036295 P 8 039078 P 10 040005 P 12 041924 P 13
FAILURE, OPERATOR ERROR
009302 P 3 014080 P 4 026087 P 6 039079 P 10
040005 P 12 058166 P 18 081882 P 24
FAILURE, PIPE
006456 P 2
FAILURE, SCRAM MECHANISM
039045 P 10
FAILURE, TUBING
039045 P 10 043147 P 14 043172 P 14
FERMI (LMFBR)
043985 P 16
FIELD EXPERIMENT
075362 P 23
FILM
033310 P 8
FISSION GAS RELEASE
030778 P 7 047843 P 16 061489 P 19 066237 P 21
068766 P 21
FISSION PRODUCT ACTIVITY, GROSS
099746 P 25
FISSION PRODUCT RELEASE
006242 P 2 013458 P 4 038276 P 9 039217 P 11
039231 P 11 052407 P 17 055992 P 18 068766 P 21
082815 P 24 094095 P 25
FISSION PRODUCT TRANSPORT
072076 P 22
FISSION PRODUCT, IODINE
082815 P 24 099746 P 25
FISSION PRODUCT, VOLATILE
037466 P 8
FLAW
061489 P 19 066237 P 21
FLOW BLOCKAGE
030208 P 7
FOOD CHAIN
075295 P 23
FOOD INTAKE
051297 P 17
FRANCE
031445 P 7 082815 P 24
FUEL BURNUP
027838 P 6 036295 P 8 039230 P 11 040005 P 12
061489 P 19 066237 P 21 072076 P 22
FUEL ELEMENTS
039079 P 10 062663 P 19
FUEL HANDLING
006242 P 2 039079 P 10
FUEL HANDLING MACHINE
039079 P 10
FUEL INTEGRITY
043571 P 15
FUEL REPROCESSING
058861 P 18 061410 P 19 073286 P 22 080212 P 24
FUEL ROD
061489 P 19 066237 P 21
FUEL STORAGE
006242 P 2
GAMMA
040701 P 12
GAMMA EMITTER
038276 P 9 039217 P 11 039231 P 11 064889 P 20
GAS
002551 P 1 003200 P 1 033070 P 8 043306 P 15
055112 P 17 064889 P 20 077129 P 23 080212 P 24
GEOLOGY
007122 P 2 043090 P 14
GERMANIUM
041924 P 13
GERMANY
043843 P 15 043845 P 15 082815 P 24
GLOVE BOX
015084 P 5 026087 P 6
GRAPHITE
062663 P 19
GROSS BETA
007122 P 2 027860 P 6 063294 P 19
GROSS GAMMA
027860 P 6 063294 P 19
GROUND WATER
007122 P 2 051305 P 17
GROUND WATER, NUCLIDE OCCURRENCE
007122 P 2 043090 P 14
GROUND WATER, TRACER
007122 P 2
GUIDE
043090 P 14
HAZARD, RELATIVE
002551 P 1 006242 P 2 033070 P 8 055992 P 18
HAZARDS ANALYSIS
014734 P 4 027977 P 7
HEALTH PHYSICS TRAINING
003269 P 1
HEAT EXCHANGERS
039045 P 10 062663 P 19
HEAT SINK
042745 P 14
HEAVY WATER
033310 P 8 040005 P 12 043847 P 15
HELIUM
041979 P 13 062663 P 19 080977 P 24
HIGH
033070 P 8
HIGH RADIATION
031445 P 7
HOT SPOT
010860 P 3
HUMBOLDT BAY (BWR)

043985 P 16 048572 P 16
HYDROGEN
037933 P 9 080704 P 24 099295 P 25
HYDROLOGY
043090 P 14
IN PILE EXPERIMENT
080977 P 24
INCIDENT
015081 P 4 015084 P 5 017118 P 5
INCIDENT, EQUIPMENT
006456 P 2 015083 P 5 039231 P 11
INCIDENT, EXPOSURE
006242 P 2
INCIDENT, HUMAN ERROR
039079 P 10 039231 P 11
INCIDENT, NONREACTOR
009025 P 3 010561 P 3
INDIAN POINT 1 (PWR)
038741 P 10 043985 P 16 048572 P 16 075040 P 23
INDUSTRIAL SAFETY
043306 P 15
INDUSTRY, NUCLEAR
048572 P 16
INGESTION
037466 P 8
INHALATION
015081 P 4 015083 P 5 026087 P 6 027977 P 7
037466 P 8 043306 P 15
INSTRUMENT CALIBRATION
063294 P 19
INSTRUMENT, ABNORMAL INDICATION
023868 P 6 030208 P 7 036295 P 8
INSTRUMENT, FLOW
036295 P 8 058166 P 18
INSTRUMENT, IN CORE
027838 P 6
INSTRUMENT, LIQUID LEVEL
006456 P 2 030208 P 7 036295 P 8
INSTRUMENT, POWER RANGE
041924 P 13
INSTRUMENTS, MISC.
061410 P 19
IODINE
006242 P 2 061410 P 19 063294 P 19 075295 P 23
077129 P 23 082815 P 24
IRRADIATION TESTING
040005 P 12
ITALY
082815 P 24
JACOBS
094095 P 25
KRYPTON
031445 P 7 043172 P 14 043989 P 16 055992 P 18
061410 P 19 065953 P 21 077129 P 23
LABORATORY EXPERIMENT
075362 P 23
LACROSSE (BWR)
038081 P 9 043985 P 16 058166 P 18
LAKE
069850 P 21
LEAK
039078 P 10 039079 P 10 039080 P 11 039230 P 11
040005 P 12 041165 P 12 041959 P 13 043172 P 14
047843 P 16 058166 P 18
LEAK RATE
043845 P 15
LEGISLATION
064725 P 20
LIQUID
003200 P 1 064889 P 20
LITHIUM
047843 P 16
MAIN COOLING SYSTEM
014734 P 4 036295 P 8 037466 P 8 039078 P 10
039079 P 10 040005 P 12
MAINTENANCE AND REPAIR
003200 P 1 027838 P 6 030778 P 7 062663 P 19
MAN
006242 P 2 027860 P 6 027977 P 7 064725 P 20
064768 P 20
MANGANESE
051297 P 17 069850 P 21 075362 P 23
MATERIAL
033310 P 8
MATURE
064768 P 20
MEASUREMENT
033310 P 8 058861 P 18 061410 P 19
METEOROLOGY
061410 P 19
MILK
064768 P 20
MODIFICATION
003200 P 1
MOLECULAR SIEVE
075295 P 23
MONITOR
006242 P 2
MONITOR, AIR
023868 P 6 038081 P 9 065252 P 20 080212 P 24
MONITOR, AREA
043090 P 14 073286 P 22
MONITOR, ENVIRONMENTAL
031445 P 7 061410 P 19 064768 P 20 065252 P 20
MONITOR, GAS
065252 P 20 077129 P 23 080212 P 24
MONITOR, GENERAL PRACTICE
004276 P 1
MONITOR, LIQUID
007122 P 2 065252 P 20
MONITOR, PERSONNEL
006242 P 2 027860 P 6 031445 P 7
MONITOR, SAMPLING
080212 P 24
MONITOR, STACK
065252 P 20 073286 P 22
MONITORING PROGRAM, ENVIRONMENTAL
058861 P 18
MONITORING SYSTEM, RADIATION
016929 P 5 027977 P 7
MPBB
064768 P 20
MPC
015083 P 5 055028 P 17 077129 P 23
MPD
006242 P 2
N-POWER FORECAST
065953 P 21
N-POWER, SAFETY OF
043989 P 16
NBS
041979 P 13
NEPTUNIUM
051297 P 17
NETHERLANDS
082815 P 24
NEUTRON
033070 P 8 069850 P 21
NFS
058861 P 18
NITROGEN
038081 P 9
NOBLE GAS
043985 P 16 075295 P 23 094095 P 25
NORWAY
006456 P 2 040005 P 12
NRC REGULATORY GUIDE
077129 P 23
NUCLEAR DETONATION
002551 P 1 055112 P 17
OFF GAS
016929 P 5
OFF SITE
002551 P 1
OPERATING EXPERIENCE
003200 P 1 038276 P 9 039079 P 10 039080 P 11
039217 P 11 039231 P 11 040005 P 12 041923 P 12
061924 P 13 041927 P 13 042745 P 14 043571 P 15
048572 P 16 057294 P 18 058166 P 18 064889 P 20
080704 P 24 081882 P 24 099746 P 25
OPERATING EXPERIENCE SUMMARY
004276 P 1 006456 P 2 055028 P 17 080704 P 24
OPERATING LICENSE PROCESS
043847 P 15
OUT OF PILE EXPERIMENT
006456 P 2
OXIDE
064725 P 20 064768 P 20 080977 P 24
PARAMETER
047843 P 16
PARTICLE
064889 P 20
PARTITION COEFFICIENT
030208 P 7
PATHFINDER (ISR)
043985 P 16
PEACH BOTTOM 1 (HTGR)
043985 P 16 048572 P 16
PERSONNEL EXPOSURE, RADIATION
006242 P 2 009022 P 2 009025 P 3 009302 P 3
010561 P 3 011919 P 3 013446 P 4 014080 P 4
015081 P 4 015083 P 5 015084 P 5 017335 P 5

026087 P 6 033310 P 8 037466 P 8 038740 P 9
039079 P 10 040701 P 12 043147 P 14 055112 P 17
064725 P 20 064768 P 20
PERSONNEL PROTECTIVE DEVICE
003269 P 1 033310 P 8
PESTICIDE
069850 P 21
PHYSIOLOGY/METABOLISM
064725 P 20 064768 P 20 069850 P 21
PIPES AND PIPE FITTINGS
039080 P 11
PLANT
051297 P 17 051305 P 17 052407 P 17
PLANT PROTECTIVE SYSTEM
006242 P 2
PLANT, MOSS/FERN
075362 P 23
PLASTICS
033310 P 8
PLOWSHARE
002551 P 1 055112 P 17
PLUTONIUM
031445 P 7
PM 1 (PWR)
014734 P 4 037933 P 9
PM 3A (PWR)
014734 P 4 037933 P 9
POISON, SOLUBLE
010860 P 3 047843 P 16
POLONIUM
031445 P 7
POPULATION EXPOSURE
055028 P 17 055992 P 18 061410 P 19 064768 P 20
080212 P 24
POWER PLANT, NUCLEAR
055992 P 18 077129 P 23 094095 P 25
PRECIPITATION
052042 P 17
PRESSURE RELIEF
039080 P 11
PROCEDURES AND MANUALS
043845 P 15
PRODUCTION
065472 P 21
PROPONENT
043989 P 16
RADIATION EFFECT
002551 P 1 037466 P 8 055992 P 18
RADIATION EXPOSURE
055992 P 18
RADIATION IN PERSPECTIVE
065953 P 21
RADIATION MONITORS
065252 P 20
RADIATION SAFETY AND CONTROL
003269 P 1 006242 P 2 006456 P 2 013446 P 4
017118 P 5 027860 P 6 027977 P 7 030778 P 7
031445 P 7 039079 P 10 043571 P 15 055992 P 18
RADIATION SOURCE, INTERNAL
099746 P 25
RADIOACTIVITY RELEASE
003200 P 1 033070 P 8 038081 P 9 038740 P 9
038741 P 10 039230 P 11 040005 P 12 043845 P 15
043985 P 16 043989 P 16 047843 P 16 048572 P 16
055028 P 17 055992 P 18 058861 P 18 064889 P 20
068766 P 21 069957 P 22 073286 P 22 075040 P 23
080212 P 24 081882 P 24 082815 P 24
RADIOBIOLOGY
002551 P 1 021995 P 6
RADIOISOTOPE
026087 P 6 033310 P 8 051297 P 17 051305 P 17
RADIOLYTIC GAS
077129 P 23
RADIONUCLIDE TRANSFER
075362 P 23
RADIONUCLIDE UPTAKE
064725 P 20 064768 P 20 065953 P 21 069850 P 21
075295 P 23 075362 P 23
RADIONUCLIDE, INDUCED
080977 P 24
RATE
052042 P 17
REACTIVITY, EXCESS
036295 P 8
REACTOR
043985 P 16 052042 P 17
REACTOR COOLANT
037466 P 8 047843 P 16 099746 P 25
REACTOR DYNAMICS
043843 P 15
REACTOR PHYSICS
062663 P 19 081882 P 24
REACTOR POWER
043989 P 16
REACTOR SAFETY SYSTEM
041979 P 13
REACTOR STABILITY
043843 P 15
REACTOR, BWR
006456 P 2 016929 P 5 038081 P 9 040005 P 12
048572 P 16 058166 P 18 065472 P 21 068766 P 21
082815 P 24
REACTOR, GCR
048572 P 16 062663 P 19 082815 P 24
REACTOR, GRAPHITE MODERATED
062663 P 19
REACTOR, HTGR
048572 P 16 062663 P 19 068766 P 21
REACTOR, HWR
003269 P 1 004361 P 1 006456 P 2 021995 P 6
023868 P 6 027977 P 7 040005 P 12
REACTOR, INTERACTING
043843 P 15 043845 P 15 043847 P 15
REACTOR, MILITARY
014734 P 4 037933 P 9 080704 P 24
REACTOR, POOL TYPE
043843 P 15 043845 P 15 043847 P 15
REACTOR, POWER
030778 P 7 037466 P 8 038741 P 10 043985 P 16
048572 P 16 064889 P 20 069957 P 22 082815 P 24
REACTOR, PRESSURE TUBE
023868 P 6
REACTOR, PWR
003200 P 1 010860 P 3 014734 P 4 023868 P 6
027838 P 6 030208 P 7 036295 P 8 037933 P 9
038121 P 9 038276 P 9 038740 P 9 038741 P 10
039045 P 10 039078 P 10 039079 P 10 039080 P 11
039217 P 11 039230 P 11 039231 P 11 040701 P 12
041165 P 12 041923 P 12 041924 P 13 041927 P 13
041959 P 13 041962 P 13 042745 P 14 043147 P 14
043172 P 14 047843 P 16 048572 P 16 063294 P 19
065953 P 21 068766 P 21 075040 P 23 081882 P 24
082815 P 24 099746 P 25
REACTOR, RESEARCH
004276 P 1 041979 P 13 043843 P 15 043845 P 15
043847 P 15
REFUELING
039079 P 10 039080 P 11 081882 P 24
REGULATION
077129 P 23
REGULATION, AEC
043985 P 16 058861 P 18
RELEASE RATE
075295 P 23 099746 P 25
REMOTE MANIPULATING AND VIEWING
038741 P 10
REPORT, OPERATIONS
003200 P 1 010860 P 3 023868 P 6 027838 P 6
030208 P 7 038121 P 9 038276 P 9 039078 P 10
039079 P 10 039080 P 11 039217 P 11 039230 P 11
039231 P 11 040005 P 12 040701 P 12 041165 P 12
041923 P 12 041924 P 13 041927 P 13 041959 P 13
041962 P 13 041979 P 13 042745 P 14 043147 P 14
043172 P 14 058166 P 18 075040 P 23 081882 P 24
REPORT, OPERATIONS ANALYSIS
016929 P 5
REPORT, OPERATIONS SUMMARY
038740 P 9 038741 P 10 048572 P 16 062663 P 19
063294 P 19
RESIN
040046 P 12
RESOURCE, NATURAL
055112 P 17
RIVER
051297 P 17 051305 P 17 052407 P 17 069850 P 21
RIVER, OTTAWA
069850 P 21
RUTHENIUM
051297 P 17 058861 P 18
SAFETY ANALYSIS
043571 P 15 043843 P 15 043845 P 15
SAFETY EVALUATION
033310 P 8
SAMPLING
040046 P 12 041979 P 13 043571 P 15 061410 P 19
073286 P 22
SAN ONOFRE 1 (PWR)
003200 P 1 038740 P 9 042745 P 14 043985 P 16
047843 P 16
SAVANNAH RIVER PLANT
043090 P 14 051297 P 17 051305 P 17 052407 P 17
064768 P 20 065252 P 20

SAXTON (PWR)
038121 P 9 043985 P 16
SCANDIUM
069850 P 21
SCRAM, REAL
006456 P 2 039078 P 10 040005 P 12 041924 P 13
058166 P 18
SCRAM, SPURIOUS
030208 P 7 058166 P 18
SEAL
038121 P 9
SEDIMENT
058861 P 18 075362 P 23
SHUTDOWN MARGIN
043845 P 15
SITING, REACTOR
043989 P 16
SOIL
041979 P 13
SORPTION
027977 P 7
SPECTROMETRY
077129 P 23
SPOKESMAN, AEC
043985 P 16 043989 P 16 055992 P 18
STACK
039078 P 10 039080 P 11 052042 P 17 061410 P 19
074952 P 22 080212 P 24
STEAM
030208 P 7
STEAM GENERATOR
030208 P 7 036295 P 8 039078 P 10 039079 P 10
039230 P 11 041165 P 12 043147 P 14 043172 P 14
STEEL, STAINLESS
047843 P 16 099295 P 25
STIMULATION
055112 P 17
STRONTIUM
043090 P 14 051297 P 17 058861 P 18 069850 P 21
SURFACE FILM DEPOSIT
061489 P 19 066237 P 21
SURFACE WATER, NUCLIDE OCCURRENCE
069850 P 21
SURVEILLANCE PROGRAM
016929 P 5 038081 P 9 043090 P 14
SURVEY, ENVIRONMENT
069850 P 21
SURVEY, RADIATION
043571 P 15
SYSTEM DESCRIPTION
043571 P 15
TECHNICAL SPECIFICATIONS
006456 P 2
TELEVISION
043306 P 15
TEMPERATURE REACTIVITY EFFECT
038741 P 10
TEST, LEAK RATE
027838 P 6
TESTING
002551 P 1 043571 P 15 081882 P 24
THERMAL MECHANICAL EFFECT
027838 P 6
THERMAL POLLUTION
043989 P 16 075295 P 23
TRACER, RADIOACTIVE
043090 P 14 069850 P 21
TRAINING
038121 P 9 038740 P 9
TRANSPORT
051297 P 17 051305 P 17 052042 P 17
TSUNAMI
042745 P 14
TURBINE
030208 P 7
UNITED KINGDOM
004276 P 1 006242 P 2 062663 P 19
VACUUM RELIEF
033070 P 8
VALVES
030208 P 7 039080 P 11 042745 P 14
VENTILATION SYSTEM
015081 P 4 015084 P 5 026087 P 6
VIBRATION ANALYSIS
042745 P 14
WASTE DISPOSAL
007122 P 2 009022 P 2 037466 P 8 037933 P 9
051305 P 17 063294 P 19
WASTE DISPOSAL, ATMOSPHERIC
039045 P 10 065953 P 21
WASTE DISPOSAL, GAS
039080 P 11 040701 P 12 041923 P 12 041924 P 13
041927 P 13 041959 P 13 041962 P 13 041979 P 13
042745 P 14 043147 P 14 043172 P 14 055028 P 17
063294 P 19 068766 P 21 069957 P 22 075040 P 23
082815 P 24
WASTE DISPOSAL, LIQUID
014734 P 4 036295 P 8 039045 P 10 039080 P 11
039230 P 11 040701 P 12 041923 P 12 041924 P 13
041927 P 13 041959 P 13 041962 P 13 041979 P 13
042745 P 14 043147 P 14 043172 P 14 055028 P 17
058861 P 18 063294 P 19 068766 P 21 069957 P 22
075040 P 23 082815 P 24
WASTE DISPOSAL, RIVER
038741 P 10 065953 P 21 075362 P 23
WASTE DISPOSAL, SOLID
041924 P 13
WASTE DISPOSAL, TERRESTRIAL
043090 P 14
WASTE HANDLING
043847 P 15
WASTE MANAGEMENT
048572 P 16 058861 P 18 063294 P 19 069957 P 22
074952 P 22 094095 P 25
WASTE TREATMENT
074952 P 22 075295 P 23 099746 P 25
WATER
055992 P 18 064768 P 20
WATER POLLUTION
043989 P 16
WATER VAPOR
080212 P 24
WATER, DRINKING
055028 P 17
WESTINGHOUSE
099746 P 25
XENON
023868 P 6 077129 P 23
YANKEE ROWE (PWR)
010860 P 3 027838 P 6 039078 P 10 039079 P 10
039080 P 11 039230 P 11 041165 P 12 041923 P 12
041924 P 13 041927 P 13 041959 P 13 043147 P 14
043985 P 16 081882 P 24
ZIRCALOY
061489 P 19 066237 P 21 072076 P 22 099295 P 25
ZIRCONIUM
051297 P 17 057294 P 18

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

ADAIR B
017335 P 5
ALBENESIUS EL
064768 P 20
ANSPAUGH LR
002551 P 1
ASHLEY C
051297 P 17
AUSTIN JH
099295 P 25
BAKKEN OK
006456 P 2
BAL G
031445 P 7
BARNES RH
014734 P 4
BARRY PJ
075295 P 23
BARTON CJ
055112 P 17
BEKUZAROV O
004361 P 1
BIRO J
057294 P 18
BOGGS RF
033070 P 8
BOWMAN CR
055112 P 17
BROWN DJ
007122 P 2
BUCHANAN PS
033070 P 8
BUSH WR
021995 P 6 027860 P 6 064725 P 20
BUTLER GC
052042 P 17
CANTILLON G
075362 P 23
CHEN EW
055112 P 17
CHISSLER RI
048572 P 16
COCHRAN JA
061410 P 19 073286 P 22 080212 P 24
COOK JE
006242 P 2
COOLEY RC
027977 P 7
COWPER G
011919 P 3
DOBRILOVIC L
004361 P 1
ELLEMAN TS
099295 P 25
FEHER I
057294 P 18
FIRING JA
006456 P 2
FLEW EM
006242 P 2
GAMERTSFELDER CC
055028 P 17
GARDINER RL
006242 P 2
GILBERT RS
065472 P 21
GRIFFIN WR
073286 P 22 080212 P 24
GROOT-WESSELDIJK A
043306 P 15
GROSSMAN LN
072076 P 22
HADZISEHOVIC H
004361 P 1
HEGLAND JO
072076 P 22
HOLLIDAY JN
074952 P 22
HORTON JH
052407 P 17
HOWARD JO
030778 P 7
HUDSPETH EL
033070 P 8
JACKSON RF
004276 P 1
JAMES BT
006242 P 2
JAMNE E
006456 P 2
JANSSEN U
069957 P 22
KARP W
009022 P 2
KATOH J
033310 P 8
KELLY MJ
055112 P 17
KILLIAN CB
009302 P 3 013446 P 4
KIRCHMANN R
075362 P 23
KNIGHT GB
011919 P 3 017335 P 5
KNUDSEN KD
006456 P 2
KUNZ CR
077129 P 23
LARSON CE
043989 P 16
LEONARD JH
047843 P 16
LOGSDON JE
048572 P 16
MAGNO PJ
061410 P 19
MARKO AM
075295 P 23
MARTER WL
065252 P 20
MARTIN A
006242 P 2
MATICVUKMIROVIC Z
004361 P 1
MATUSZEK JM
077129 P 23
MAWSON CA
069850 P 21
MEGERTH FH
061489 P 19 066237 P 21
MEYER AS
055112 P 17
MINNICK LE
010860 P 3
MORECRAFT WT
003269 P 1
MORGAN IL
033070 P 8
MOUNTAIN JE
047843 P 16
NELLIS DO
033070 P 8
NUSSBAUM E
004414 P 2
OATES WH
094095 P 25
OHUCHI M
033310 P 8
OPHEL IL
075295 P 23
OVREEIDE M
006456 P 2
PAPERIELLO CJ
077129 P 23
PATTERSON CM
065252 P 20
PEROTIN JP
031445 P 7
PEURA EW
037933 P 9
PEURA EWA
080704 P 24
PUECHL KH
009025 P 3
RAY JW
014734 P 4 037466 P 8
REICHERT SC
043090 P 14 051305 P 17
REINING WC
064768 P 20

RIBNIKAR SV
004361 P 1
ROBINSON WL
002551 P 1
ROWE PC
011919 P 3
SAGAN LA
055992 P 18
SHLEIEN B
061410 P 19
SMITH DG
061410 P 19
SMITH JM
065472 P 21
STOEVER D
080977 P 24
THIE JA
043571 P 15
THOMPSON TJ
043985 P 16
TROIANELLO FJ
073286 P 22 080212 P 24
TSAI CM
040046 P 12
VAUGH HA
010561 P 3
VERGHESE K
099295 P 25
WASCHER RE
030778 P 7
WENG PS
040046 P 12
WILSON R
075295 P 23
WOOLLEN WB
006242 P 2
WOOTON RO
014734 P 4
WRIGHT JH
065953 P 21
WULLUM T
006456 P 2

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN THE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE. * INDICATES END OF TITLE.)

#HEALTH PHYSICS CONTROL OF	A.E.R.E. RESEARCH REACTORS*	006242 P 2
#TRITIUM CONTAMINATION IN PARTICLE	ACCELERATOR OPERATION*	033070 P 8
OF ATMOSPHERIC CONTAMINATION IN LABORATORIES OF HIGH	ACTIVITY* #DETECTION	031445 P 7
#EXPERIENCE WITH DILUTION RATE FACTORS FROM THE	AECL REACTOR STACK.*	052042 P 17
#INVESTIGATION OF ZR-T	AEROSOL*	057294 P 18
#SEMINAR ON THE PROTECTION	AGAINST THE DANGERS OF TRITIUM*	013458 P 4
FUEL REPROCESSING PLANT* #AN INVESTIGATION OF	AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR	061410 P 19
REPROCESSING PLANT* #OBSERVATION OF	AIRBORNE TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL	080212 P 24
#	ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1965*	011919 P 3
#	ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1966*	017335 P 5
#	ANALYSIS OF RADIATION EXPOSURES IN 1967*	027860 P 6
#HBWR QUARTERLY PROGRESS REPORT,	APRIL-JUNE 1969*	040005 P 12
#CONTROLLING TRITIUM HAZARDS	AROUND HEAVY WATER MODERATED REACTORS*	027977 P 7
THE SAFETY REPORT SUBMITTED TO #SAFETY REPORT FOR THE CORE	ARRANGEMENT WITH TWO FISSIONING REGIONS - SUPPLEMENT TO	043843 P 15
#STATEMENT ON THE SELECTION OF	AS LOW AS PRACTICABLE DESIGN OBJECTIVE*	055028 P 17
#STATEMENT ON THE SELECTION OF AS LOW	AS PRACTICABLE DESIGN OBJECTIVE*	055028 P 17
ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* #SOME	ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE	075295 P 23
IN THE (EUROPEAN) COMMUNITY-DISCHARGE DATA RADIOLOGICAL	ASPECTS* #RADIOACTIVE EFFLUENTS FROM NUCLEAR POWER STATION	082815 P 24
RULISON*' #	ASSESSMENT OF POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT	002551 P 1
#TRITIUM HAZARDS	ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR*	003269 P 1
NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE	ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS*AT BROOKHAVEN	064889 P 20
#DETECTION OF	ATMOSPHERIC CONTAMINATION IN LABORATORIES OF HIGH ACTIVITY*	031445 P 7
SUPPLEMENT TO THE SAFFTY REPORT SUBMITTED TO THE LICENSING	AUTHORITY IN APRIL 1966 REGARDING THE RESEARCH AND	043843 P 15
#LACBWR PROVISION OPERATING	AUTHORIZATION DPRA-5. CAVITY MONITORING AND LEAK DETECTION*	038081 P 9
RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN	BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL	064889 P 20
PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM	BEHAVIOR IN A NATURAL GAS PROCESSING PLANT* OF CONSUMER	055112 P 17
EFFLUENTS FROM PWR NUCLEAR POWER PLANTS* #	BEHAVIOR IN RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN	075362 P 23
SINTERED BEO COMPACTS* #DETERMINATION OF THE RELEASE	BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED	080977 P 24
OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED	BEO COMPACTS* #DETERMINATION OF THE RELEASE BEHAVIOR	080977 P 24
#ASSESSMENT OF POTENTIAL	BIOLOGICAL HAZARDS FROM PROJECT RULISON*	002551 P 1
LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 -	BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL	069850 P 21
#TRITIUM EXPERIENCE IN	BOILING WATER REACTORS*	065472 P 21
AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH	BRANCH (P. 29-41)* JULY 1 TO SEPT. 30, 1971 - BIOLOGY	069850 P 21
AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT	BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH	064889 P 20
ON THE SAFETY OF THE RESEARCH AND MEASUREMENT REACTOR,	BRUNSWICK* #EXPERT OPINION	043865 P 15
MATERIAL REGARDING THE RESEARCH AND MEASUREMENT REACTOR	BRUNSWICK* #MISCELLANEOUS LICENSING	043847 P 15
#DETERMINATION OF THE TRITIUM	BUILD-UP IN A HEAVY WATER MODERATED REACTOR*	004361 P 1
AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN	CANADA* #SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY	075295 P 23
#LACBWR PROVISION OPERATING AUTHORIZATION DPRA-5.	CAVITY MONITORING AND LEAK DETECTION*	038081 P 9
#REVIEW OF	CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)*	064725 P 20
#REVIEW OF	CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER*	021995 P 6
TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - #	CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1	069850 P 21
NATIONAL #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED	CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN.	064889 P 20
#	CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES*	077129 P 23
REPROCESSING PLANT* #	CHARACTERIZATION OF TRITIUM STACK EFFLUENT FROM A FUEL	073286 P 22
#OPERATING EXPERIENCE WITH HBWR ON ITS SECOND FUEL	CHARGE*	006456 P 2
INVESTIGATIONS JANUARY-DECEMBER, 1964* #	CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL	007122 P 2
#INTERNAL EXPOSURE OF	CHEMIST TO TRITIUM*	026087 P 6
#JOHNS HOPKINS UNIVERSITY	CITED FOR NON COMPLIANCE*	017118 P 5
REPORT II, MAY - JULY 1970* #ZIRCALOY -	CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS	061489 P 19
REPORT 13, NOV. 1970 TO MAR. 1971* #ZIRCALOY-	CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS	066237 P 21
POLYMERIC FILMS, AND SAFETY EVALUATION OF PROTECTIVE	CLOTHING AND GLOVES MADE OF POLYMERIC FILMS* WATER THROUGH	033310 P 8
EFFLUENTS FROM NUCLEAR POWER STATION IN THE (EUROPEAN)	COMMUNITY-DISCHARGE DATA RADIOLOGICAL ASPECTS*#RADIOACTIVE	082815 P 24
OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO	COMPACTS* #DETERMINATION OF THE RELEASE BEHAVIOR	080977 P 24
RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME	COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER	064889 P 20
#JOHNS HOPKINS UNIVERSITY CITED FOR NON	COMPLIANCE*	017118 P 5
#A PRELIMINARY STUDY OF TRITIUM	CONCENTRATION IN TSING HUA REACTOR COOLANT*	040046 P 12
#RADIATION	CONSIDERATIONS IN NUCLEAR POWER PLANTS*	030778 P 7
TRITIUM BEHAVIOR IN A NATURAL #THEORETICAL EVALUATION OF	CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT.	055112 P 17
#TRITIUM	CONTAMINATION AT THEODORE R. SCHWALM, INC.*	010200 P 3
#DETECTION OF ATMOSPHERIC	CONTAMINATION IN LABORATORIES OF HIGH ACTIVITY*	031445 P 7
#TRITIUM	CONTAMINATION IN PARTICLE ACCELERATOR OPERATION*	033070 P 8
#HEALTH PHYSICS	CONTROL OF A.E.R.E. RESEARCH REACTORS*	006242 P 2
PLANT* #	CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER	064768 P 20
REACTORS* #	CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED	027977 P 7
STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR	COOLANT* #A PRELIMINARY	040046 P 12
TO THE SAFETY REPORT SUBMITTED TO #SAFETY REPORT FOR THE	CORE ARRANGEMENT WITH TWO FISSIONING REGIONS - SUPPLEMENT	043843 P 15
#TRITIUM EXPOSURE AT U.S. RADIUM	CORP. JAN. 11, 1967*	015084 P 5
#TRITIUM EXPOSURE AT US RADIUM	CORP., DEC. 13, 1966*	015083 P 5
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR	CORPORATION*	014080 P 4

#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966* 009302 P 3
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966* 009025 P 3
#TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966* 010561 P 3
#TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966* 013446 P 4
#SELECTED CVTR OPERATING EXPERIENCE* 023868 P 6

#SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM* 013458 P 4
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 25
NUCLEAR POWER STATION IN THE (EUROPEAN) COMMUNITY-DISCHARGE DATA RADIOLOGICAL ASPECTS* #RADIOACTIVE EFFLUENTS FROM 082815 P 24
#ELK RIVER REACTOR SYSTEM MONITORING DATA* 016929 P 5
#ELK RIVER REACTOR SYSTEM MONITORING DATA* 043571 P 15
#TRITIUM EXPOSURE AT US RADIUM CORP., DEC. 13, 1966* 015083 P 5
#HADDAM NECK PLANT OPERATION REPORT FOR MONTH OF DEC. 1969* 040701 P 12
EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY- DECEMBER, 1964* #CHEMICAL 007122 P 2
#STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE* 055028 P 17
HIGH ACTIVITY* # DETECTION OF ATMOSPHERIC CONTAMINATION IN LABORATORIES OF 031445 P 7
OPERATING AUTHORIZATION DPRA-5. CAVITY MONITORING AND LEAK DETECTION* #LACBWR PROVISION 038081 P 9
TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO COMPACTS* # DETERMINATION OF THE RELEASE BEHAVIOR OF HELIUM AND 080977 P 24
MODERATED REACTOR* # DETERMINATION OF THE TRITIUM BUILD-UP IN A HEAVY WATER 004361 P 1
DIFFUSION OF RADIOACTIVE GASES THROUGH FILMS* 006414 P 2
#SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-STAINLESS STEEL AND ZIRCALOY-2* 099295 P 25
#EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL REACTOR STACK.* 052042 P 17
FROM NUCLEAR POWER STATION IN THE (EUROPEAN) COMMUNITY- DISCHARGE DATA RADIOLOGICAL ASPECTS*#RADIOACTIVE EFFLUENTS 082815 P 24
#OBSERVATION OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING PLANT* 080212 P 24
FACILITIES.* #RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER 048572 P 16
IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES.* #RADIONUCLIDES 051305 P 17
IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* #RADIONUCLIDES 043090 P 14
#CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY-DECEMBER, 1964* 007122 P 2
#TRITIUM DISTRIBUTION IN HIGH POWER ZIRCALOY FUEL ELEMENTS* 072076 P 22
JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (P. 29-41)* 069850 P 21
#LACBWR PROVISION OPERATING AUTHORIZATION DPRA-5. CAVITY MONITORING AND LEAK DETECTION* 038081 P 9
#OECD HIGH-TEMPERATURE REACTOR PROJECT DRAGON, 11TH ANNUAL REPORT 1969-1970* 062663 P 19
RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970* #REPORT ON 068766 P 21

RADIOACTIVITY. SEMIANNUAL REPORT JULY THROUGH DECEMBER # EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL 051297 P 17
#THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS* 043989 P 16
#THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS* 043985 P 16
AND ZIRCALOY-2* #SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-STAINLESS STEEL 099295 P 25
#CHARACTERIZATION OF TRITIUM STACK EFFLUENT FROM A FUEL REPROCESSING PLANT* 073296 P 22
#AN INVESTIGATION OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL REPROCESSING PLANT* 061410 P 19
RADIATION LEVELS AT BROOKHAVEN #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND 064889 P 20
#REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT* 074952 P 22
#REPORT ON RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970* 068766 P 21
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 18
COMMUNITY-DISCHARGE DATA RADIOLOGICAL ASPECTS* #RADIOACTIVE EFFLUENTS FROM NUCLEAR POWER STATION IN THE (EUROPEAN) 082815 P 24
#BEHAVIOR IN RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR POWER PLANTS* 075362 P 23
DECEMBER, 1964* #CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY- 007122 P 2
#THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS* 043985 P 16
#THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS* 043989 P 16
#TRITIUM DISTRIBUTION IN HIGH POWER ZIRCALOY FUEL ELEMENTS* 072076 P 22
ELK RIVER REACTOR SYSTEM MONITORING DATA* 043571 P 15
ELK RIVER REACTOR SYSTEM MONITORING DATA* 016929 P 5
#NUCLEAR POWER PLANT EMISSIONS* 069957 P 22
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION* 014080 P 4
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966* 009302 P 3
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966* 009025 P 3
#TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966* 013446 P 4
#RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES.* 048572 P 16
ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* #SOME 075295 P 23
#MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT* 065252 P 20
#THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS* 043985 P 16
#THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS* 043989 P 16
ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS* 065953 P 21
THROUGH DECEMBER #EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JULY 051297 P 17
1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (P. 29-41)* REPORT, JULY 069850 P 21
#RADIOACTIVE EFFLUENTS FROM NUCLEAR POWER STATION IN THE (EUROPEAN) COMMUNITY-DISCHARGE DATA RADIOLOGICAL ASPECTS* 082815 P 24
FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, 055112 P 17
#TECHNICAL EVALUATION OF PM-1 NUCLEAR POWER PLANT* 037933 P 9
TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE OF 033310 P 8
PROGRAMS* #TECHNICAL EVALUATION OF THE PM-1 NUCLEAR POWER PLANT AND RELATED 080704 P 24
JULY 1970* #ZIRCALOY - CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT II, MAY - 061489 P 19
1970 TO MAR. 1971* #ZIRCALOY-CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT 13, NOV. 066237 P 21
#REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT* 074952 P 22
#TRITIUM EXPERIENCE IN BOILING WATER REACTORS* 065472 P 21
RESEARCH REACTORS* # EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX 004276 P 1
REACTOR STACK.* # EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL 052042 P 17
#OPERATING EXPERIENCE WITH HBWR ON ITS SECOND FUEL CHARGE* 006456 P 2
* # EXPERIENCE WITH THE USE OF RADIOACTIVE HYDROGEN IN INDUSTRY 043306 P 15
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 20
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER* 021995 P 6
#SELECTED HADDAM NECK OPERATING EXPERIENCE* 030208 P 7
#SELECTED CVTR OPERATING EXPERIENCE* 023868 P 6

```
                                    #SELECTED OPERATING  EXPERIENCE*                                                041923 P 12
                                    #SELECTED OPERATING  EXPERIENCE*                                                041927 P 13
                          #SELECTED HADDAM NECK OPERATING  EXPERIENCE*                                              036295 P  8
                                    #SELECTED OPERATING  EXPERIENCES*                                               039230 P 11
MEASUREMENT REACTOR, BRUNSWICK*                        #  EXPERT OPINION ON THE SAFETY OF THE RESEARCH AND          043845 P 15
                                          #TRITIUM  EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION*                  014080 P  4
1966*                                     #TRITIUM  EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16,     009302 P  3
1966*                                     #TRITIUM  EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24,     009025 P  3
                                          #TRITIUM  EXPOSURE AT TRACERLAB, JANUARY 10, 1966*                      009022 P  2
                                          #TRITIUM  EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966*           010561 P  3
                                          #TRITIUM  EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967*                  015084 P  5
                                          #TRITIUM  EXPOSURE AT US RADIUM CORP., DEC. 13, 1966*                   015083 P  5
                                         #INTERNAL  EXPOSURE OF CHEMIST TO TRITIUM*                               026087 P  6
POPULATION*                             #RADIATION  EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE            094095 P 25
                                          #TRITIUM  EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966* 013446 P  4
                                   #HUMAN RADIATION  EXPOSURES FROM NUCLEAR POWER REACTORS*                       055992 P 18
                          #ANALYSIS OF EXTERNAL RADIATION  EXPOSURES IN 1965*                                      011919 P  3
                          #ANALYSIS OF EXTERNAL RADIATION  EXPOSURES IN 1966*                                      017335 P  5
                                #ANALYSIS OF RADIATION  EXPOSURES IN 1967*                                         027860 P  6
                                       #ANALYSIS OF  EXTERNAL RADIATION EXPOSURES IN 1965*                         011919 P  3
                                       #ANALYSIS OF  EXTERNAL RADIATION EXPOSURES IN 1966*                         017335 P  5


    WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER  FACILITIES.*                          #RADIOACTIVE  048572 P 16
  IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL  FACILITIES.*                        #RADIONUCLIDES  051305 P 17
              #CHARACTERIZATION OF RADIOGASES FROM NUCLEAR  FACILITIES*                                           077129 P 23
  IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL  FACILITIES*                        #RADIONUCLIDES  043090 P 14
                          #EXPERIENCE WITH DILUTION RATE  FACTORS FROM THE AECL REACTOR STACK.*                    052042 P 17
                  #JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE,  FEB. 20, 1967*                                       015081 P  4
                       #DIFFUSION OF RADIOACTIVE GASES THROUGH  FILMS*                                             004414 P  2
        OF PROTECTIVE CLOTHING AND GLOVES MADE OF POLYMERIC  FILMS*WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION  033310 P  8
 PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC  FILMS, AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND  033310 P  8
     EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY,  FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING  055112 P 17
                                                         #  FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.*    052407 P 17
SUBMITTED  #SAFETY REPORT FOR THE CORE ARRANGEMENT WITH THO  FISSIONING REGIONS - SUPPLEMENT TO THE SAFETY REPORT    043843 P 15
          #EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-  FLUX RESEARCH REACTORS*                                004276 P  1
 APRIL 1966 REGARDING THE RESEARCH AND MEASUREMENT REACTOR (  FMRB)*      REPORT SUBMITTED TO THE LICENSING AUTHORITY IN  043843 P 15
                #OPERATING EXPERIENCE WITH PBWR ON ITS SECOND  FUEL CHARGE*                                          006456 P  2
                 #TRITIUM DISTRIBUTION IN HIGH POWER ZIRCALOY  FUEL ELEMENTS*                                        072076 P 22
          #CHARACTERIZATION OF TRITIUM STACK EFFLUENT FROM A  FUEL REPROCESSING PLANT*                               073286 P 22
        OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A NUCLEAR  FUEL REPROCESSING PLANT*                     #OBSERVATION  080212 P [illegible]
 OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR  FUEL REPROCESSING PLANT*                  #AN INVESTIGATION  061410 P 19
MAY - JULY 1970*                        #ZIRCALOY - CLAD UO2  FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT II,  061489 P 19
NOV. 1970 TO MAR. 1971*                   #ZIRCALOY-CLAD UO2  FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT 13,  066237 P 21


     GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL  GAS PROCESSING PLANT*    OF CONSUMER PRODUCTS FROM PROJECT  055112 P 17
  #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT  GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS  055112 P 17
                                #DIFFUSION OF RADIOACTIVE  GASES THROUGH FILMS*                                      004414 P  2
                                #MONITORING OF TRITIUM IN  GASES, LIQUIDS, AND IN THE ENVIRONMENT*                   065252 P 20
1969*                                  #SAN ONOFRE NUCLEAR  GENERATING STATION OPERATION REPORT FOR THE MONTH OF JUNE  038740 P  9
                                #INVESTIGATION OF TRITIUM  GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS*        014734 P  4
    FILMS, AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND  GLOVES MADE OF POLYMERIC FILMS*    WATER THROUGH POLYMERIC  033310 P  8
FACILITIES*                             #RADIONUCLIDES IN  GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL    043090 P 14
FACILITIES.*                            #RADIONUCLIDES IN  GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL    051305 P 17


                                                         #  HADDAM NECK MONTHLY OPERATION REPORT FOR JAN., 1970*     041962 P 13
                                                         #  HADDAM NECK MONTHLY OPERATION REPORT FOR SEPTEMBER 1969* 039045 P 10
                                          #SELECTED  HADDAM NECK OPERATING EXPERIENCE*                               036295 P  8
                                          #SELECTED  HADDAM NECK OPERATING EXPERIENCE*                               030208 P  7
                                                         #  HADDAM NECK OPERATION REPORT FOR FEBRUARY 1970*          043172 P 14
                                                         #  HADDAM NECK PLANT OPERATION REPORT FOR MONTH OF DEC. 1969* 040701 P 12
                                #CONTROLLING TRITIUM  HAZARDS AROUND HEAVY WATER MODERATED REACTORS*                 027977 P  7
                                          #TRITIUM  HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR*         003269 P  1
                                #CONTROL OF TRITIUM HEALTH  HAZARDS AT THE SAVANNAH RIVER PLANT*                     064768 P 20
                          #ASSESSMENT OF POTENTIAL BIOLOGICAL  HAZARDS FROM PROJECT RULISON*                         002551 P  1
                                #OPERATING EXPERIENCE WITH  HBWR ON ITS SECOND FUEL CHARGE*                          006456 P  2
                                                         #  HBWR QUARTERLY PROGRESS REPORT, APRIL-JUNE 1969*         040005 P 12
                                #CONTROL OF TRITIUM  HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT*                     064768 P 20
                                                         #  HEALTH PHYSICS CONTROL OF A.E.R.E. RESEARCH REACTORS*    006242 P  2
    PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND  HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (  069850 P 21
*                                                #THE  HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS 043985 P 16
*                                                #THE  HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC POWER PLANTS 043989 P 16
        #SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND  HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA*  075295 P 23
          #REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED  HEAVY WATER (T6865)*                                     064725 P 20
                          #TRITIUM HAZARDS ASSOCIATED WITH A  HEAVY WATER MODERATED REACTOR*                         003269 P  1
                #DETERMINATION OF THE TRITIUM BUILD-UP IN A  HEAVY WATER MODERATED REACTOR*                          004361 P  1
                          #CONTROLLING TRITIUM HAZARDS AROUND  HEAVY WATER MODERATED REACTORS*                       027977 P  7
OF        #MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED  HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION  033310 P  8
          #REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED  HEAVY WATER*                                             021995 P  6
COMPACTS*          #DETERMINATION OF THE RELEASE BEHAVIOR OF  HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO  080977 P 24
```

#DETECTION OF ATMOSPHERIC CONTAMINATION IN LABORATORIES OF HIGH ACTIVITY* 031445 P 7
#TRITIUM DISTRIBUTION IN HIGH POWER ZIRCALOY FUEL ELEMENTS* 072076 P 22
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* 004276 P 1
REPORT 1969-1970* #OECD HIGH-TEMPERATURE REACTOR PROJECT DRAGON, 11TH ANNUAL 062663 P 19
#JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 5
#JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967* 015081 P 4
#A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT* 040046 P 12
HUMAN RADIATION EXPOSURES FROM NUCLEAR POWER REACTORS* 055992 P 19
#EXPERIENCE WITH THE USE OF RADIOACTIVE HYDROGEN IN INDUSTRY* 043306 P 15

UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT II, MAY - JULY 1970* #ZIRCALOY - CLAD 061489 P 19
#TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.* 010200 P 3
31-66* # INDIAN POINT SEMI-ANNUAL OPERATIONS REPORT FOR 8-1-65 TO 1- 038741 P 10
#SEMIANNUAL RADIOACTIVITY RELEASES FROM INDIAN POINT 1* 075040 P 23
#EXPERIENCE WITH THE USE OF RADIOACTIVE HYDROGEN IN INDUSTRY* 043306 P 15
#SELECTED ITEMS OF INTEREST* 058166 P 18
#SELECTED ITEMS OF INTEREST* 039079 P 10
#SELECTED ITEMS OF INTEREST* 039078 P 10
#SELECTED ITEMS OF INTEREST* 041924 P 13
#SELECTED ITEMS OF INTEREST* 039080 P 11
#SELECTED ITEMS OF INTEREST* 003200 P 1
INTERNAL EXPOSURE OF CHEMIST TO TRITIUM* 026087 P 6
OPERATING NUCLEAR FUEL REPROCESSING PLANT* #AN INVESTIGATION OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN 061410 P 19
NUCLEAR POWER PLANTS* # INVESTIGATION OF TRITIUM GENERATION AND RELEASE IN PM 014734 P 4
INVESTIGATION OF ZR-T AEROSOL* 057794 P 18
#CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY-DECEMBER, 1964* 007122 P 2
OF THE RELEASE BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON- IRRADIATED SINTERED BEO COMPACTS* #DETERMINATION 080977 P 24
#SELECTED ITEMS OF INTEREST* 003200 P 1
#SELECTED ITEMS OF INTEREST* 041924 P 13
#SELECTED ITEMS OF INTEREST* 058166 P 18
#SELECTED ITEMS OF INTEREST* 039078 P 10
#SELECTED ITEMS OF INTEREST* 039080 P 11
#SELECTED ITEMS OF INTEREST* 039079 P 10
#OPERATING EXPERIENCE WITH HBWR ON ITS SECOND FUEL CHARGE* 006456 P 2

#TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967* 015084 P 5
#HADDAM NECK MONTHLY OPERATION REPORT FOR JAN., 1970* 041962 P 13
CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY-DECEMBER, 1964* # 007122 P 2
JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 5
JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967* 015081 P 4
#YANKEE OPERATION REPORT NO. 66, FOR THE MONTH OF JUNE, 1966* 010860 P 3

#DETECTION OF ATMOSPHERIC CONTAMINATION IN LABORATORIES OF HIGH ACTIVITY* 031445 P 7
BIOLOGY AND HEALTH PHYSICS DIVISION - #CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 - 069850 P 21
IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH 064889 P 20
MONITORING AND LEAK DETECTION* # LACBWR PROVISION OPERATING AUTHORIZATION DPRA-5. CAVITY 038081 P 9
OPERATING AUTHORIZATION DPRA-5. CAVITY MONITORING AND LEAK DETECTION* #LACBWR PROVISION 038081 P 9
RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME 064889 P 20
REGIONS - SUPPLEMENT TO THE SAFETY REPORT SUBMITTED TO THE LICENSING AUTHORITY IN APRIL 1966 REGARDING THE RESEARCH 043843 P 15
REACTOR BRUNSWICK* #MISCELLANEOUS LICENSING MATERIAL REGARDING THE RESEARCH AND MEASUREMENT 043847 P 15
LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 18
#MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT* 065252 P 20
#STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE* 055028 P 17

AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE OF POLYMERIC FILMS* WATER THROUGH POLYMERIC FILMS, 033310 P 8
PROGRAM. QUARTERLY PROGRESS REPORT 13, NOV. 1970 TO MAR. 1971* #ZIRCALOY-CLAD UO2 FUEL ROD EVALUATION 066237 P 21
BRUNSWICK* #MISCELLANEOUS LICENSING MATERIAL REGARDING THE RESEARCH AND MEASUREMENT REACTOR 043847 P 15
AUTHORITY IN APRIL 1966 REGARDING THE RESEARCH AND MEASUREMENT REACTOR (FMRB)* SUBMITTED TO THE LICENSING 043843 P 15
MISCELLANEOUS LICENSING MATERIAL REGARDING THE RESEARCH AND MEASUREMENT REACTOR BRUNSWICK* # 043847 P 15
#EXPERT OPINION ON THE SAFETY OF THE RESEARCH AND MEASUREMENT REACTOR, BRUNSWICK* 043845 P 15
WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF # MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED HEAVY 033310 P 8
AND MEASUREMENT REACTOR BRUNSWICK* # MISCELLANEOUS LICENSING MATERIAL REGARDING THE RESEARCH 043847 P 15
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR* 003269 P 1
#DETERMINATION OF THE TRITIUM BUILD-UP IN A HEAVY WATER MODERATED REACTOR* 004361 P 1
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 7
#LACBWR PROVISION OPERATING AUTHORIZATION DPRA-5. CAVITY MONITORING AND LEAK DETECTION* 038081 P 9
#ELK RIVER REACTOR SYSTEM MONITORING DATA* 016929 P 5
#ELK RIVER REACTOR SYSTEM MONITORING DATA* 043571 P 15
ENVIRONMENT* # MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE 065252 P 20
#HADDAM NECK PLANT OPERATION REPORT FOR MONTH OF DEC. 1969* 040701 P 12
#OPERATION REPORT NO. 69-2 FOR THE MONTH OF FEBRUARY 1969* 038276 P 9
YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 110 - FOR MONTH OF FEBRUARY 1970* # 043147 P 14
ONOFRE NUCLEAR GENERATING STATION OPERATION REPORT FOR THE MONTH OF JUNE 1969* #SAN 038740 P 9
#YANKEE OPERATION REPORT NO. 66, FOR THE MONTH OF JUNE, 1966* 010860 P 3
#OPERATION REPORT NO. 69-5 FOR THE MONTH OF MAY 1969* 039231 P 11
#OPERATION REPORT 69-10 FOR THE MONTH OF OCTOBER 1969* 039217 P 11

CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE 064889 P 20
FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT* OF CONSUMER PRODUCTS 055112 P 17
#OPERATIONS REPORT FROM NBS REACTOR FOR OCTOBER-DECEMBER 1969* 041979 P 13
#HADDAM NECK MONTHLY OPERATION REPORT FOR JAN., 1970* 041962 P 13
#HADDAM NECK MONTHLY OPERATION REPORT FOR SEPTEMBER 1969* 039045 P 10
#SELECTED HADDAM NECK OPERATING EXPERIENCE* 030208 P 7
#SELECTED HADDAM NECK OPERATING EXPERIENCE* 036295 P 8
#HADDAM NECK OPERATION REPORT FOR FEBRUARY 1970* 043172 P 14
#HADDAM NECK PLANT OPERATION REPORT FOR MONTH OF DEC. 1969* 040701 P 12
OF THE RELEASE BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO COMPACTS* #DETERMINATION 080977 P 24
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION* 014080 P 4
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966* 009302 P 3
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966* 009025 P 3
#TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966* 013446 P 4
#JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 5
FUEL ROD EVALUATION PROGRAM, QUARTERLY PROGRESS REPORT 13, NOV. 1970 TO MAR. 1971* #ZIRCALOY-CLAD UO2 066237 P 21
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION* 014080 P 4
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966* 009302 P 3
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966* 009025 P 3
#TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966* 013446 P 4
#CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES* 077129 P 23
#OBSERVATION OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING PLANT* 080212 P 24
OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL REPROCESSING PLANT* #AN INVESTIGATION 061410 P 19
OF JUNE 1969* #SAN ONOFRE NUCLEAR GENERATING STATION OPERATION REPORT FOR THE MONTH 038740 P 9
1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - #CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30, 069850 P 21
#RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES.* 048572 P 16
#TECHNICAL EVALUATION OF THE PM-1 NUCLEAR POWER PLANT AND RELATED PROGRAMS* 080704 P 24
NUCLEAR POWER PLANT EMISSIONS* 069957 P 22
#TECHNICAL EVALUATION OF PM-1 NUCLEAR POWER PLANT* 037933 P 9
#INVESTIGATION OF TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS* 014734 P 4
#RADIATION CONSIDERATIONS IN NUCLEAR POWER PLANTS* 030778 P 7
OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR POWER PLANTS* #BEHAVIOR IN RIVERS 075362 P 23
LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS*LEVELS AT BROOKHAVEN NATIONAL 064889 P 20
#RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION* 094095 P 25
#HUMAN RADIATION EXPOSURES FROM NUCLEAR POWER REACTORS* 055992 P 18
DISCHARGE DATA RADIOLOGICAL #RADIOACTIVE EFFLUENTS FROM NUCLEAR POWER STATION IN THE (EUROPEAN) COMMUNITY- 082815 P 24
#YANKEE NUCLEAR POWER STATION OPERATING REPORT FOR DECEMBER 1969* 041165 P 12
OF FEBRUARY 1970* #YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 110 - FOR MONTH 043147 P 14
1971* #YANKEE NUCLEAR POWER STATION, OPERATION REPORT NO. 124, FOR APRIL 063294 P 19
RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* #SOME ASPECTS OF THE 075295 P 23
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 18

#STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE* 055028 P 17
NUCLEAR FUEL REPROCESSING PLANT* # OBSERVATION OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A 080212 P 24
#OPERATIONS REPORT FROM NBS REACTOR FOR OCTOBER-DECEMBER 1969* 041979 P 13
REPORT 1969-1970* # OECD HIGH-TEMPERATURE REACTOR PROJECT DRAGON, 11TH ANNUAL 062663 P 19
#SEMI ANNUAL OPERATING REPORT FOR SAN ONOFRE FOR JULY TO DECEMBER 1969* 042745 P 14
MONTH OF JUNE 1969* #SAN ONOFRE NUCLEAR GENERATING STATION OPERATION REPORT FOR THE 038740 P 9
CETECTION* #LACBWR PROVISION OPERATING AUTHORIZATION DPRA-5. CAVITY MONITORING AND LEAK 038081 P 9
OPERATING EXPERIENCE WITH HBWR ON ITS SECOND FUEL CHARGE* 006456 P 2
#SELECTED CVTR OPERATING EXPERIENCE* 023868 P 6
#SELECTED HADDAM NECK OPERATING EXPERIENCE* 030208 P 7
#SELECTED HADDAM NECK OPERATING EXPERIENCE* 036295 P 8
#SELECTED OPERATING EXPERIENCE* 041923 P 12
#SELECTED OPERATING EXPERIENCE* 041927 P 13
#SELECTED OPERATING EXPERIENCES* 039230 P 11
#AN INVESTIGATION OF,AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL REPROCESSING PLANT* 061410 P 19
#YANKEE NUCLEAR POWER STATION OPERATING REPORT FOR DECEMBER 1969* 041165 P 12
#SEMI ANNUAL OPERATING REPORT FOR SAN ONOFRE FOR JULY TO DECEMBER 1969* 042745 P 14
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* 004276 P 1
#YANKEE ROWE OPERATION REPORT FOR APRIL 1973* 081882 P 24
#HADDAM NECK OPERATION REPORT FOR FEBRUARY 1970* 043172 P 14
#HADDAM NECK MONTHLY OPERATION REPORT FOR JAN., 1970* 041962 P 13
#HADDAM NECK PLANT OPERATION REPORT FOR MONTH OF DEC. 1969* 040701 P 12
#HADDAM NECK MONTHLY OPERATION REPORT FOR SEPTEMBER 1969* 039045 P 10
#SAN ONOFRE NUCLEAR GENERATING STATION OPERATION REPORT FOR THE MONTH OF JUNE 1969* 038740 P 9
#YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 110 - FOR MONTH OF FEBRUARY 1970* 043147 P 14
#YANKEE NUCLEAR POWER STATION, OPERATION REPORT NO. 124, FOR APRIL 1971* 063294 P 19
#YANKEE OPERATION REPORT NO. 66, FOR THE MONTH OF JUNE, 1966* 010860 P 3
OPERATION REPORT NO. 69-2 FOR THE MONTH OF FEBRUARY 1969* 038276 P 9
OPERATION REPORT NO. 69-5 FOR THE MONTH OF MAY 1969* 039231 P 11
OPERATION REPORT 69-10 FOR THE MONTH OF OCTOBER 1969* 039217 P 11
#YANKEE OPERATION REPORT 91 - JULY 1968* 027838 P 6
#TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION* 033070 P 8
OPERATIONS REPORT FOR AUGUST 1969* 038121 P 9
#MONTHLY OPERATIONS REPORT FOR JANUARY 1970 FOR YANKEE* 041959 P 13
#INDIAN POINT SEMI-ANNUAL OPERATIONS REPORT FOR 8-1-65 TO 1-31-66* 038741 P 10
1969* # OPERATIONS REPORT FROM NBS REACTOR FOR OCTOBER-DECEMBER 041979 P 13
REACTOR, BRUNSWICK* #EXPERT OPINION ON THE SAFETY OF THE RESEARCH AND MEASUREMENT 043845 P 15
#RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION* 094095 P 25

HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (P. 29-41)* REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND 069850 P 21

#TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION* 033070 P 8
FILMS, AND SAFETY EVALUATION OF #MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC 033310 P 9
#HEALTH PHYSICS CONTROL OF A.E.R.E. RESEARCH REACTORS* 006242 P 2
REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (P. 29-41) 069850 P 21
#REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT* 074952 P 22
#TECHNICAL EVALUATION OF THE PM-1 NUCLEAR POWER PLANT AND RELATED PROGRAMS* 080704 P 24
#NUCLEAR POWER PLANT EMISSIONS* 069957 P 22
JULY THROUGH DECEMBER 1963.* #EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT 051297 P 17
#HADDAM NECK PLANT OPERATION REPORT FOR MONTH OF DEC. 1969* 040701 P 12
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES.* 051305 P 17
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* 043090 P 14
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 20
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 18
#TECHNICAL EVALUATION OF PM-1 NUCLEAR POWER PLANT* 037933 P 9
REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT* # 074952 P 22
OF TRITIUM STACK EFFLUENT FROM A FUEL REPROCESSING PLANT* #CHARACTERIZATION 073286 P 22
TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING PLANT* #OBSERVATION OF AIRBORNE 080212 P 24
EFFLUENT FROM AN OPERATING NUCLEAR FUEL REPROCESSING PLANT* #AN INVESTIGATION OF AIRBORNE RADIOACTIVE 061410 P 19
FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT* OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, 055112 P 17
#FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.* 052407 P 17
#THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC PLANTS* 043989 P 16
#THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC PLANTS* 043985 P 16
#RADIATION CONSIDERATIONS IN NUCLEAR POWER PLANTS* 030778 P 7
OF TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS* #INVESTIGATION 014734 P 4
AND RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR POWER PLANTS* #BEHAVIOR IN RIVERS OF RADIOCOBALT 075362 P 23
WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS*BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS 064889 P 20
#INVESTIGATION OF TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS* 014734 P 4
#TECHNICAL EVALUATION OF THE PM-1 NUCLEAR POWER PLANT AND RELATED PROGRAMS* 080704 P 24
#TECHNICAL EVALUATION OF PM-1 NUCLEAR POWER PLANT* 037933 P 9
#INDIAN POINT SEMI-ANNUAL OPERATIONS REPORT FOR 8-1-65 TO 1-31-66* 038741 P 10
#SEMIANNUAL RADIOACTIVITY RELEASES FROM INDIAN POINT 1* 075040 P 23
SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE OF POLYMERIC FILMS* HEAVY WATER THROUGH POLYMERIC FILMS, AND 033310 P 9
OF THE PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF PROTECTIVE 033310 P 8
EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION* #RADIATION 094095 P 25
#ASSESSMENT OF POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT RULISON* 002551 P 1
WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES.* #RADIOACTIVE 048572 P 16
#TECHNICAL EVALUATION OF THE PM-1 NUCLEAR POWER PLANT AND RELATED PROGRAMS* 080704 P 24
#NUCLEAR POWER PLANT EMISSIONS* 069957 P 22
#TECHNICAL EVALUATION OF PM-1 NUCLEAR POWER PLANT* 037933 P 9
#RADIATION CONSIDERATIONS IN NUCLEAR POWER PLANTS* 030778 P 7
#THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC PLANTS* 043985 P 16
#THE HEARING ON ENVIRONMENTAL EFFECTS FROM ELECTRIC PLANTS* 043989 P 16
OF TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS* #INVESTIGATION 014734 P 4
AND RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR POWER PLANTS* #BEHAVIOR IN RIVERS OF RADIOCOBALT 075362 P 23
AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS* AT BROOKHAVEN NATIONAL LABORATORY 064889 P 20
#RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION* 094095 P 25
#REPORT ON RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970* 068766 P 21
#HUMAN RADIATION EXPOSURES FROM NUCLEAR POWER REACTORS* 055992 P 18
#TRITIUM IN POWER REACTORS* 037466 P 8
RADIOLOGICAL ASPECTS* #RADIOACTIVE EFFLUENTS FROM NUCLEAR POWER STATION IN THE (EUROPEAN) COMMUNITY-DISCHARGE DATA 082815 P 24
#YANKEE NUCLEAR POWER STATION OPERATING REPORT FOR DECEMBER 1969* 041165 P 12
FEBRUARY 1970* #YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 110 - FOR MONTH OF 043147 P 14
#YANKEE NUCLEAR POWER STATION, OPERATION REPORT NO. 124, FOR APRIL 1971* 063294 P 19
#TRITIUM DISTRIBUTION IN HIGH POWER ZIRCALOY FUEL ELEMENTS* 072076 P 22
#STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE* 055028 P 17
REACTOR COOLANT* #A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA 040046 P 17
#TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR* 047843 P 16
#ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS* 065953 P 21
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 25
GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT* OF CONSUMER PRODUCTS FROM PROJECT 055112 P 17
#FISSION PRODUCT TRITIUM AT THE SAVANNAH RIVER PLANT.* 052407 P 17
#TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR* 047843 P 16
BEHAVIOR IN A NATURAL #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM 055112 P 17
#ZIRCALOY - CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT II, MAY - JULY 1970* 061489 P 19
1971* #ZIRCALOY-CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT 13, NOV. 1970 TO MAR. 066237 P 21
EVALUATION OF THE PM-1 NUCLEAR POWER PLANT AND RELATED PROGRAMS* #TECHNICAL 080704 P 24
#OECD HIGH-TEMPERATURE REACTOR PROJECT DRAGON, 11TH ANNUAL REPORT 1969-1970* 062663 P 19
NATURAL #THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A 055112 P 17
#ASSESSMENT OF POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT RULISON* 002551 P 1
#SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM* 013458 P 4
WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE OF POLYMERIC FILMS* 033310 P 8
MONITORING AND LEAK DETECTION* #LACBWR PROVISION OPERATING AUTHORIZATION DPRA-5, CAVITY 038081 P 9
RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR POWER PLANTS* #BEHAVIOR IN 075362 P 23

#TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.* 010200 P 3
RADIATION CONSIDERATIONS IN NUCLEAR POWER PLANTS* 030778 P 7
THE POPULATION* # RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND 094095 P 25
#HUMAN RADIATION EXPOSURES FROM NUCLEAR POWER REACTORS* 055992 P 18
#ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1965* 011919 P 3
#ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1966* 017335 P 5
#ANALYSIS OF RADIATION EXPOSURES IN 1967* 027860 P 6
#ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS* 065953 P 21
OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND 064889 P 20
REPROCESSING PLANT* #AN INVESTIGATION OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL 061410 P 19
EUROPEAN) COMMUNITY-DISCHARGE DATA RADIOLOGICAL ASPECTS* # RADIOACTIVE EFFLUENTS FROM NUCLEAR POWER STATION IN THE (082815 P 24

#DIFFUSION OF
#EXPERIFNCE WITH THE USE OF
NUCLEAR POWER FACILITIES.* #
REACTORS IN CANADA* #SOME ASPECTS CF THE RELEASES OF
#REPORT ON RELEASE OF
#SEMIANNUAL
1963.* #EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL
NUCLEAR POWER PLANTS* #BEHAVIOR IN RIVERS OF
#CHARACTERIZATION OF
POWER STATION IN THE (EUROPEAN) COMMUNITY-DISCHARGE DATA
#BEHAVIOR IN RIVERS OF RADIOCOBALT AND
WASTE DISPOSAL FACILITIES.* #
WASTE DISPOSAL FACILITIES* #
#TRITIUM EXPOSURE AT U.S.
#TRITIUM EXPOSURE AT US
#TRITIUM EXPOSURE AT U. S.
#EXPERIENCE WITH DILUTION
SAFETY FVALUATION OF #MEASUREMENTS OF THE PERMEATION
IN APRIL 1966 REGARDING THE RESEARCH AND MEASUREMENT
LICENSING MATERIAL REGARDING THE RESEARCH AND MEASUREMENT
#A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN TSING HUA
#OPFRATIONS REPCRT FROM NBS
SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER
#OECC HIGH-TEMPERATURE
#EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL
#ELK RIVER
#ELK RIVFR
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED
#TRITIUM PRODUCTION IN A PRESSURIZED WATER
OF THE TRITIUM BUILD-UP IN A HEAVY WATER MODERATED
OPINION ON THE SAFETY OF THE RESEARCH AND MEASUREMENT
#RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER
OF RADIOACTIVITY AND HEAT TO THF ENVIRONMENT FROM NUCLEAR
#REPORT ON RELEASE OF RADIOACTIVITY FROM POWER
#HUMAN RADIATION EXPOSURES FROM NUCLEAR POWER
#TRITIUM EXPERIENCE IN BOILING WATER
#ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER
#HEALTH PHYSICS CONTROL OF A.E.R.E. RESEARCH
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED
#TRITIUM IN POWER
CF OPERATION ANC USE OF THE U.K. HIGH-FLUX RESEARCH
BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL #A
PINELLAS PLANT* #
REPORT SUBMITTED TO THE LICENSING AUTHORITY IN APRIL 1966
#MISCELLANEOUS LICENSING MATERIAL
#SAFETY REPORT FOR THE CORE ARRANGEMENT WITH TWO FISSIONING
BROOKHAVEN #A RECAPITULATION OF EFFLUENT RELEASES AND
#TECHNICAL EVALUATION OF THE PM-1 NUCLEAR POWER PLANT AND
IRRADIATED SINTERED BEO COMPACTS* #DETERMINATION OF THE
#INVESTIGATION OF TRITIUM GENERATION AND
DURING 1970* #REPORT ON
#JOHNS HOPKINS UNIVERSITY TRITIUM
LEVELS AT BROOKHAVEN NATIONAL #A RECAPITULATION OF EFFLUENT
#SEMIANNUAL RADIOACTIVITY
NUCLEAR REACTORS IN CANADA* #SCME ASPECTS OF THE
OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL
#HBWR QUARTERLY PROGRESS
PHYSICS DIVISION #CHALK RIVER NUCLEAR LABORATORIES PROGRESS
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR
#CHARACTERIZATION OF TRITIUM STACK FFFLUENT FROM A FUEL
OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL
RADIOACTIVE FFFLUENT FROM AN OPERATING NUCLEAR FUEL
TO THE LICENSING AUTHORITY IN APRIL 1966 REGARDING THE
#MISCELLANFOUS LICENSING MATERIAL REGARDING THE
#EXPERT OPINION ON THE SAFETY OF THE
1971 - BIOLOGY AND HEALTH PHYSICS DIVISICN - ENVIRONMENTAL
#HFALTH PHYSICS CCNTROL OF A.E.R.E.
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX
WATER (T6865)* #
*
#PEVIEW OF CHALK
#REVIEW OF CHALK
SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION #CHALK
REPORT JULY THROUGH DECEMBER 1963.* #EFFECT OF THE SAVANNAH
#RADIONUCLIDES IN GRCUNDWATER AT THE SAVANNAH
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH
#FISSION PRODUCT TRITIUM AT THE SAVANNAH
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH
#ELK
#ELK
PWR NUCLEAR POWER PLANTS* #BEHAVIOR IN
JULY 1970* #ZIRCALCY - CLAD UO2 FUEL
1970 TO MAR. 1971* #ZIRCALOY-CLAD UO2 FUEL
#YANKEE
#ASSESSMENT OF POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT

RADIOACTIVE GASES THROUGH FILMS* 004414 P 2
RADIOACTIVE HYDROGEN IN INDUSTRY* 043306 P 15
RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM 048572 P 16
RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR 075295 P 23
RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970* 068766 P 21
RADIOACTIVITY RELEASES FROM INDIAN POINT 1* 075040 P 23
RADIOACTIVITY. SEMIANNUAL REPORT JULY THROUGH DECEMBER 051297 P 17
RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM PWR 075362 P 23
RADIOGASES FROM NUCLEAR FACILITIES* 077129 P 23
RADIOLOGICAL ASPECTS* #RADIOACTIVE EFFLUENTS FROM NUCLEAR 082815 P 24
RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR POWER PLANTS* 075362 P 23
RADIONUCLIDES IN GROUNCWATER AT THE SAVANNAH RIVER PLANT 051305 P 17
RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT 043090 P 14
RADIUM CORP. JAN. 11, 1967* 015084 P 5
RADIUM CORP., DEC. 13, 1966* 015083 P 5
RADIUM CORPORATION, JUNE 2, 1966* 010561 P 3
RATE FACTORS FROM THE AECL REACTOR STACK.* 052042 P 17
RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND 033310 P 8
REACTOR (FMRB)*REPORT SUBMITTED TO THE LICENSING AUTHORITY 043843 P 15
REACTOR BRUNSWICK* #MISCELLANEOUS 043847 P 15
REACTOR COOLANT* 040046 P 12
REACTOR FOR OCTOBER-DECEMBER 1969* 041979 P 13
REACTOR PLANTS* AT BROOKHAVEN NATIONAL LABORATORY AND 064889 P 20
REACTOR PROJECT DRAGON, 11TH ANNUAL REPORT 1969-1970* 062663 P 19
REACTOR STACK.* 052042 P 17
REACTOR SYSTEM MONITORING DATA* 043571 P 15
REACTOR SYSTEM MONITORING DATA* 016929 P 5
REACTOR* 003269 P 1
REACTOR* 047843 P 16
REACTOR* #DETERMINATION 004361 P 1
REACTOR, BRUNSWICK* #EXPERT 043845 P 15
REACTORS AND THF POPULATION* 094095 P 25
REACTORS IN CANADA* #SOME ASPECTS OF THE RELEASES 075295 P 23
REACTORS IN EFFLUENTS CURING 1970* 068766 P 21
REACTORS* 055992 P 18
REACTORS* 065472 P 21
REACTORS* 065953 P 21
REACTORS* 099746 P 25
REACTORS* 006242 P 2
REACTORS* 027977 P 7
REACTORS* 037466 P 8
REACTORS* #EXPERIENCE 004276 P 1
RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN 064889 P 20
REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT 074952 P 22
REGARDING THE RESEARCH AND MEASUREMENT REACTOR (FMRB)* 043843 P 15
REGARDING THE RESEARCH AND MEASUREMENT REACTOR BRUNSWICK* 043847 P 15
REGIONS - SUPPLEMENT TO THE SAFETY REPORT SUBMITTED TO THE 043843 P 15
RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT 064889 P 20
RELATED PROGRAMS* 080704 P 24
RELEASE BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON- 080977 P 24
RELEASE IN PM NUCLEAR POWER PLANTS* 014734 P 4
RELEASE OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS 068766 P 21
RELEASE. FEB. 20, 1967* 015081 P 4
RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION 064889 P 20
RELEASES FROM INDIAN PCINT 1* 075040 P 23
RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM 075295 P 23
REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT* 055112 P 17
REPORT, APRIL-JUNE 1969* 040005 P 12
REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH 069850 P 21
REPROCESSING PLANT* 058861 P 18
REPROCESSING PLANT* 073286 P 27
REPROCESSING PLANT* #OBSERVATION 080212 P 24
REPROCESSING PLANT* #AN INVESTIGATION OF AIRBORNE 061410 P 19
RESEARCH AND MEASUREMENT REACTOR (FMRB)* REPORT SUBMITTED 043843 P 15
RESEARCH AND MEASUREMENT REACTOR BRUNSWICK* 043847 P 15
RESEARCH AND MEASUREMENT REACTOR, BRUNSWICK* 043845 P 15
RESEARCH BRANCH (P. 29-41)* REPORT, JULY 1 TO SEPT. 30, 069850 P 21
RESEARCH REACTORS* 006242 P 2
RESEARCH REACTORS* 004276 P 1
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY 064725 P 20
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER 021995 P 6
RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 20
RIVER EXPERIENCE WITH TRITIATED HEAVY WATER* 021995 P 6
RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO 069850 P 21
RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL 051297 P 17
RIVER PLANT WASTE DISPCSAL FACILITIES.* 051305 P 17
RIVER PLANT WASTE DISPOSAL FACILITIES* 043090 P 14
RIVER PLANT.* 052407 P 17
RIVER PLANT* 064768 P 20
RIVER REACTOR SYSTEM MONITORING DATA* 043571 P 15
RIVER REACTOR SYSTEM MONITORING DATA* 016929 P 5
RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM 075362 P 23
ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT II, MAY - 061489 P 19
ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT 13, NOV. 066237 P 21
ROWE OPERATION REPORT FOR APRIL 1973* 081882 P 24
RULISON* 002551 P 1

#TRITIUM EXPOSURE AT U.	S. RADIUM CORPORATION, JUNE 2, 1966*	010561 P 3
RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND	SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE	033310 P 8
#EXPERT OPINION ON THE	SAFETY OF THE RESEARCH AND MEASUREMENT REACTOR, BRUNSWICK*	043845 P 15
REGIONS - SUPPLEMENT TO THE SAFETY REPORT SUBMITTED TO THE #	SAFETY REPORT FOR THE CORE ARRANGEMENT WITH TWO FISSIONING	043843 P 15
ARRANGEMENT WITH TWO FISSIONING REGIONS - SUPPLEMENT TO THE	SAFETY REPORT SUBMITTED TO THE LICENSING AUTHORITY IN	043843 P 15
#SEMI ANNUAL OPERATING REPORT FOR	SAN ONOFRE FOR JULY TO DECEMBER 1969*	042745 P 14
THE MONTH OF JUNE 1969* #	SAN ONOFRE NUCLEAR GENERATING STATION OPERATION REPORT FOR	038740 P 9
SEMIANNUAL REPORT JULY THROUGH DECEMBER 1963.#EFFECT OF THE	SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY.	051297 P 17
#RADIONUCLIDES IN GROUNDWATER AT THE	SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES.*	051305 P 17
#RADIONUCLIDES IN GROUNDWATER AT THE	SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES*	043090 P 14
#FISSION PRODUCT TRITIUM AT THE	SAVANNAH RIVER PLANT.*	052407 P 17
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE	SAVANNAH RIVER PLANT*	064768 P 20
#TRITIUM CONTAMINATION AT THEODORE R.	SCHWALM, INC.*	010200 P 3
#OPERATING EXPERIENCE WITH HWR ON ITS	SECOND FUEL CHARGE*	006456 P 2
#	SELECTED CVTR OPERATING EXPERIENCE*	023868 P 6
#	SELECTED HADDAM NECK OPERATING EXPERIENCE*	036295 P 8
#	SELECTED HADDAM NECK OPERATING EXPERIENCE*	030208 P 7
#	SELECTED ITEMS OF INTEREST*	041924 P 13
#	SELECTED ITEMS OF INTEREST*	039078 P 10
#	SELECTED ITEMS OF INTEREST*	003200 P 1
#	SELECTED ITEMS OF INTEREST*	039079 P 10
#	SELECTED ITEMS OF INTEREST*	039080 P 11
#	SELECTED ITEMS OF INTEREST*	058166 P 18
#	SELECTED OPERATING EXPERIENCE*	041927 P 13
#	SELECTED OPERATING EXPERIENCE*	041923 P 12
#	SELECTED OPERATING EXPERIENCES*	039230 P 11
#STATEMENT ON THE	SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE*	055028 P 17
DECEMBER 1969* #	SEMI ANNUAL OPERATING REPORT FOR SAN ONOFRE FOR JULY TO	042745 P 14
#INDIAN POINT	SEMI-ANNUAL OPERATIONS REPORT FOR 8-1-65 TO 1-31-66*	038741 P 10
#	SEMIANNUAL RADIOACTIVITY RELEASES FROM INDIAN POINT 1*	075040 P 23
OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY.	SEMIANNUAL REPORT JULY THROUGH DECEMBER 1963.* #EFFECT	051297 P 17
#	SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM*	013458 P 4
CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO	SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION -	069850 P 21
BEHAVIOR OF HELIUM AND TRITIUM FROM NEUTRON-IRRADIATED	SINTERED BEO COMPACTS* #DETERMINATION OF THE RELEASE	080977 P 24
THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* #	SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO	075295 P 23
RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND	SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER	064889 P 20
REACTORS* #	SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER	099746 P 25
#CHARACTERIZATION OF TRITIUM	STACK EFFLUENT FROM A FUEL REPROCESSING PLANT*	073286 P 22
#REDUCTION OF TRITIUM IN EXHAUST	STACK EFFLUENTS AT PINELLAS PLANT*	074952 P 22
EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL REACTOR	STACK.* #	052042 P 17
#SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-	STAINLESS STEEL AND ZIRCALOY-2*	099295 P 25
OBJECTIVE* #	STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN	055028 P 17
RADIOLOGICAL #RADIOACTIVE EFFLUENTS FROM NUCLEAR POWER	STATION IN THE (EUROPEAN) COMMUNITY-DISCHARGE DATA	082815 P 24
#YANKEE NUCLEAR POWER	STATION OPERATING REPORT FOR DECEMBER 1969*	041165 P 12
#SAN ONOFRE NUCLEAR GENERATING	STATION OPERATION REPORT FOR THE MONTH OF JUNE 1969*	038740 P 9
1970* #YANKEE NUCLEAR POWER	STATION OPERATION REPORT NO. 110 - FOR MONTH OF FEBRUARY	043147 P 14
#YANKEE NUCLEAR POWER	STATION, OPERATION REPORT NO. 124, FOR APRIL 1971*	063294 P 19
EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-STAINLESS	STEEL AND ZIRCALOY-2* #SURFACE	099295 P 25
* #A PRELIMINARY	STUDY OF TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT	040046 P 12
TWO FISSIONING REGIONS - SUPPLEMENT TO THE SAFETY REPORT	SUBMITTED TO THE LICENSING AUTHORITY IN APRIL 1966	043843 P 15
FOR THE CORE ARRANGEMENT WITH TWO FISSIONING REGIONS -	SUPPLEMENT TO THE SAFETY REPORT SUBMITTED TO THE LICENSING	043843 P 15
STAINLESS STEEL AND ZIRCALOY-2* #	SURFACE EFFECTS ON THE DIFFUSION OF TRITIUM IN 304-	099295 P 25
#ELK RIVER REACTOR	SYSTEM MONITORING DATA*	016929 P 5
#ELK RIVER REACTOR	SYSTEM MONITORING DATA*	043571 P 15

1964* #CHEMICAL EFFLUENTS	TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY-DECEMBER,	007122 P 2
1969-1970* #OECD HIGH-	TEMPERATURE REACTOR PROJECT DRAGON, 11TH ANNUAL REPORT	062663 P 19
#SOURCE	TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS*	099746 P 25
#TRITIUM CONTAMINATION AT	THEODORE R. SCHWALM, INC.*	010200 P 3
GASBUGGY, FINAL REPORT. TRITIUM BEHAVIOR IN A NATURAL GAS #	THEORETICAL EVALUATION OF CONSUMER PRODUCTS FROM PROJECT	055112 P 17
AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH	THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS* LEVELS	064889 P 20
ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JULY	THROUGH DECEMBER 1963.*#EFFECT OF THE SAVANNAH RIVER PLANT	051297 P 17
#DIFFUSION OF RADIOACTIVE GASES	THROUGH FILMS*	004414 P 2
OF THE PERMEATION RATE OF TRITIATED HEAVY WATER	THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF	033310 P 8
#TRITIUM EXPOSURE AT	TRACERLAB, JANUARY 10, 1966*	009022 P 2
#REVIEW OF CHALK RIVER EXPERIENCE WITH	TRITIATED HEAVY WATER (T68651)*	064725 P 20
EVALUATION OF #MEASUREMENTS OF THE PERMEATION RATE OF	TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY	033310 P 8
#REVIEW OF CHALK RIVER EXPERIENCE WITH	TRITIATED HEAVY WATER*	021995 P 6
#FISSION PRODUCT	TRITIUM AT THE SAVANNAH RIVER PLANT.*	052407 P 17
OF CONSUMER PRODUCTS FROM PROJECT GASBUGGY, FINAL REPORT.	TRITIUM BEHAVIOR IN A NATURAL GAS PROCESSING PLANT*	055112 P 17
#DETERMINATION OF THE	TRITIUM BUILD-UP IN A HEAVY WATER MODERATED REACTOR*	004361 P 1
#A PRELIMINARY STUDY OF	TRITIUM CONCENTRATION IN TSING HUA REACTOR COOLANT*	040046 P 12
#	TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.*	010200 P 3
#	TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION*	033070 P 8
#	TRITIUM DISTRIBUTION IN HIGH POWER ZIRCALOY FUEL ELEMENTS*	072076 P 22
#	TRITIUM EXPERIENCE IN BOILING WATER REACTORS*	065472 P 21
#	TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION*	014080 P 4
FEBRUARY 16, 1966* #	TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION,	009302 P 3
FEBRUARY 24, 1966* #	TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION,	009025 P 3
#	TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966*	009022 P 2
#	TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966*	010561 P 3
#	TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967*	015084 P 5
#	TRITIUM EXPOSURE AT US RADIUM CORP., DEC. 13, 1966*	015083 P 5
OCTOBER 1966* #	TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION,	013446 P 4
#DETERMINATION OF THE RELEASE BEHAVIOR OF HELIUM AND	TRITIUM FROM NEUTRON-IRRADIATED SINTERED BEO COMPACTS*	080977 P 24

#INVESTIGATION OF	TRITIUM GENERATION AND RELEASE IN PM NUCLEAR POWER PLANTS*	014734 P 4
#CONTROLLING	TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS*	027977 P 7
REACTOR* #	TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED	003269 P 1
#CONTROL OF	TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT*	064768 P 20
#REDUCTION OF	TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT*	074952 P 22
#MONITORING OF	TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT*	065252 P 20
#	TRITIUM IN POWER REACTORS*	037466 P 8
#SURFACE EFFECTS ON THE DIFFUSION OF	TRITIUM IN 304-STAINLESS STEEL AND ZIRCALOY-2*	099295 P 25
#	TRITIUM PRODUCTION IN A PRESSURIZED WATER REACTOR*	047843 P 16
#JOHNS HOPKINS UNIVERSITY	TRITIUM RELEASE, FEB. 20, 1967*	015081 P 4
#CHARACTERIZATION OF	TRITIUM STACK EFFLUENT FROM A FUEL REPROCESSING PLANT*	073286 P 22
PLANT* #OBSERVATION OF AIRBORNE	TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING	080212 P 24
#SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF	TRITIUM*	013458 P 4
#INTERNAL EXPOSURE OF CHEMIST TO	TRITIUM*	026087 P 6
#A PRELIMINARY STUDY OF TRITIUM CONCENTRATION IN	TSING HUA REACTOR COOLANT*	040046 P 12
SUBMITTED TO #SAFETY REPORT FOR THE CORE ARRANGEMENT WITH	TWO FISSIONING REGIONS - SUPPLEMENT TO THE SAFETY REPORT	043843 P 15
OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (	T6865)* #REVIEW	064725 P 20
#TRITIUM EXPOSURE AT	U. S. RADIUM CORPORATION, JUNE 2, 1966*	010561 P 3
#EXPERIENCE OF OPERATION AND USE OF THE	U.K. HIGH-FLUX RESEARCH REACTORS*	004276 P 1
#TRITIUM EXPOSURE AT	U.S. RADIUM CORP. JAN. 11, 1967*	015084 P 5
#JOHNS HOPKINS	UNIVERSITY CITED FOR NON COMPLIANCE*	017118 P 5
#JOHNS HOPKINS	UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967*	015081 P 4
#DETERMINATION OF THE TRITIUM BUILD-	UP IN A HEAVY WATER MODERATED REACTOR*	004361 P 1
#TRITIUM EXPOSURE AT	US RADIUM CORP., DEC. 13, 1966*	015083 P 5
#EXPERIENCE WITH THE	USE OF RADIOACTIVE HYDROGEN IN INDUSTRY*	043306 P 15
#EXPERIENCE OF OPERATION AND	USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS*	004276 P 1
13, NOV. 1970 TO MAR. 1971* #ZIRCALOY-CLAD	UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT	066237 P 21
II, MAY - JULY 1970* #ZIRCALOY - CLAD	UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT	061489 P 19
#OBSERVATION OF AIRBORNE TRITIUM	WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING PLANT*	080212 P 24
FACILITIES.* #RADIOACTIVE	WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER	048572 P 16
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT	WASTE DISPOSAL FACILITIES.*	051305 P 17
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT	WASTE DISPOSAL FACILITIES*	043090 P 14
#CHEMICAL EFFLUENTS TECHNOLOGY	WASTE DISPOSAL INVESTIGATIONS JANUARY-DECEMBER, 1964*	007122 P 2
#LIQUID	WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT*	058861 P 18
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY	WATER (T6865)*	064725 P 20
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY	WATER MODERATED REACTOR*	003269 P 1
#DETERMINATION OF THE TRITIUM BUILD-UP IN A HEAVY	WATER MODERATED REACTOR*	004361 P 1
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY	WATER MODERATED REACTORS*	027977 P 7
#TRITIUM PRODUCTION IN A PRESSURIZED	WATER REACTOR*	047843 P 16
#ENVIRONMENTAL RADIATION FROM PRESSURIZED	WATER REACTORS*	065953 P 21
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED	WATER REACTORS*	099746 P 25
#TRITIUM EXPERIENCE IN BOILING	WATER REACTORS*	065472 P 21
#MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED HEAVY	WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF	033310 P 8
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY	WATER*	021995 P 6
#SOURCE TERM DATA FOR	WESTINGHOUSE PRESSURIZED WATER REACTORS*	099746 P 25
1969* #	YANKEE NUCLEAR POWER STATION OPERATING REPORT FOR DECEMBER	041165 P 12
FOR MONTH OF FEBRUARY 1970* #	YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 110 -	043147 P 14
FOR APRIL 1971* #	YANKEE NUCLEAR POWER STATION, OPERATION REPORT NO. 124,	063294 P 19
* #	YANKEE OPERATION REPORT NO. 66, FOR THE MONTH OF JUNE, 1966	010860 P 3
#	YANKEE OPERATION REPORT 91 - JULY 1968*	027838 P 6
#	YANKEE ROWE OPERATION REPORT FOR APRIL 1973*	081882 P 24
#MONTHLY OPERATIONS REPORT FOR JANUARY 1970 FOR	YANKEE*	041959 P 13
PROGRESS REPORT II, MAY - JULY 1970* #	ZIRCALOY - CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY	061489 P 19
#TRITIUM DISTRIBUTION IN HIGH POWER	ZIRCALOY FUEL ELEMENTS*	072076 P 22
PROGRESS REPORT 13, NOV. 1970 TO MAR. 1971* #	ZIRCALOY-CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY	066237 P 21
ON THE DIFFUSION OF TRITIUM IN 304-STAINLESS STEEL AND	ZIRCALOY-2* #SURFACE EFFECTS	099295 P 25
#INVESTIGATION OF	ZR-T AEROSOL*	057294 P 19

III Handling Procedures

III - HANDLING PROCEDURES

003269
MORECRAFT WT
TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR
ATOMIC ENERGY OF CANADA, LIMITED, CHALK RIVER, ONTARIO, CANADA
4 PAGES, 2 FIGURES, 1 TABLE, 2 REFERENCES- AM. INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 24- 87-90 (1963)- AECL-1697

TO CONTROL THE HAZARDS OF TRITIUM EXPOSURES AT THE NRU REACTOR OF ATOMIC ENERGY OF CANADA LIMITED, A VARIED SAFETY PROGRAM EMPHASIZES EDUCATION, MONITORING, EXHAUST VENTILATION, PROTECTIVE CLOTHING, AND BIOCHEMICAL ANALYSES FOR TRITIUM IN THE BODY. THE ICRP STANDARD OF 5 X 10 MINUS 6 MU C/CM 3 IS USED FOR MAXIMAL PERMISSIBLE EXPOSURE. TRITIUM RELEASE IS CONTROLLED BY OPERATIONAL PROCEDURES AND VENTILATION.

CANADA + HEALTH PHYSICS TRAINING + REACTOR, HWR + *PERSONNEL PROTECTIVE DEVICE + *RADIATION SAFETY AND CONTROL

004276
JACKSON RF
EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
15 PAGES, 4 FIGURES, 1 TABLE, 7 REFERENCES- MAY 1964, A/CONF. 28/P.123- PRESENTED AT THIRD U. N. INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, AUGUST 31-SEPTEMBER 9, 1964- IAEA

THE PRINCIPAL FEATURES OF THE THREE SIMILAR U.K. HEAVY WATER HIGH FLUX RESEARCH REACTOR, DIDO AND PLUTO AT HARWELL AND THE DOUNREAY MATERIALS TESTING REACTOR ARE BRIEFLY RECALLED. BRIEF MENTION IS MADE OF THE HEALTH PHYSICS ARRANGEMENT TO DETECT AND CONTROL LEAKAGE OF RADIOACTIVE SPECIES FROM EITHER THE REACTOR OR EXPERIMENTS INTO THE ENVIRONMENT. EXPERIENCE OF TRITIUM IS PARTICULARLY DISCUSSED.

MONITOR, GENERAL PRACTICE + *REACTOR, RESEARCH + *UNITED KINGDOM + OPERATING EXPERIENCE SUMMARY

005311
SYMONDS AE
EVALUATION OF PLASTIC FILMS FOR PROTECTIVE SUITING
E. I. DU PONT DE NEMOURS AND COMPANY
18 PAGES, 8 TABLES, 6 REFERENCES- DP-528, NOVEMBER 1960- OTS

A LAMINATE OF SARAN AND POLYVINYL CHLORIDE FILM WAS FOUND TO BE THE BEST OF SEVERAL FILMS TESTED FOR USE IN SUITING FOR PROTECTION OF PERSONNEL IN ATMOSPHERES CONTAINING TRITIUM. CANDIDATE FILMS WERE EVALUATED BY MEASURING THE PERMEABILITY TO AND DIFFUSION RATES OF TRITIATED WATER VAPOR, AND BY MEASURING THE RETENTION AND EASE OF REMOVAL OF TRITIUM ACTIVITY. AN IMPROVED CELL FOR MEASURING THE PERMEABILITY OF POLYMER FILMS WAS DEVELOPED AS A MEANS OF EVALUATING THE FILMS. THE CELL UTILIZES THE IONIZING PROPERTIES OF THE RADIATION FROM TRITIUM TO DETECT THE CONCENTRATION OF TRITIATED WATER VAPOR DIFFUSION THROUGH THE TEST FILMS.

FABRICATION + *PERSONNEL PROTECTIVE DEVICE + *RADIOISOTOPE + TEST, BENCH + *FUEL REPROCESSING + *FUEL CONVERSION + FUEL ELEMENTS

009022
KARP W
TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966
TRACERLAB
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12(12)- 31 (MARCH 21, 1966)

VARIOUS TRITIUM CONTAMINATED OBJECTS WERE DOUBLE BAGGED, AND PLACED IN WASTE DRUMS TO BE CEMENTED IN. EITHER DURING THE CEMENT POURING OR PUSHING DOWN A FLOATING OBJECT, TRITIUM MUST HAVE BEEN RELEASED.

*WASTE DISPOSAL + *PERSONNEL EXPOSURE, RADIATION

009025
PUECHL KH
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966
NUCLEAR MATERIALS AND EQUIPMENT CORPORATION
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12(12)- 28 (MARCH 21, 1966)

A TRITIUM EXPOSURE MAY RESULT IN A WHOLE BODY EXPOSURE OF 5 REM, DUE TO HANDLING TRITIATED WATER DURING PRODUCTION OF AN ORGANIC COMPOUND.

*PERSONNEL EXPOSURE, RADIATION + *INCIDENT, NONREACTOR

009302
KILLIAN CB
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(15) PAGE 46, APRIL 11, 1966

009302 *CONTINUED*
A CHEMIST OPENED AN EVACUATED SYSTEM SEVERAL TIMES IN A HOOD, TO ADD MATERIAL TO TRITIATED WATER. HIS CUMULATIVE INTERNAL EXPOSURE WAS 4.26 REMS DURING A THREE-WEEK PERIOD.

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION

010200
TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.
DIVISION OF STATE AND LICENSEE RELATIONS, USAEC
2 PAGES, APRIL 14, 1966, ATOMIC ENERGY CLEARING HOUSE, 12(22), PAGES 20-21 (MAY 30, 1966)

AEC INSPECTION REVEALED THAT EMPLOYEES LEAVING TRITIUM PAINTING AREAS HAD 59,000 DIS/MIN OF REMOVABLE TRITIUM ON THEIR HANDS AND STREET SHOES. EMPLOYEES HAD MONITORED THEMSELVES WITH AN ULTRAVIOLET LIGHT (USED FOR LUMINOUS PAINT) INEFFECTIVE AGAINST TRITIUM. IN ADDITION, CONTAMINATED CLOTHES ARE REUSED WITHOUT WASHING, INADEQUATE CHANGE ROOMS EXIST, AND CONTAMINATED DIAL HOLDERS ARE PASSED INTO UNRESTRICTED AREAS. AEC INDICATES THAT OTHER PAINTERS WITH CAREFUL HOUSEKEEPING CAN OPERATE WITHIN THEIR LIMITS.

*CONTAMINATION + *FAILURE, ADMINISTRATIVE CONTROL

010561
VAUGH HA
TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966
U. S. RADIUM CORPORATION
1 PAGE, JUNE 2, 1966, ATOMIC ENERGY CLEARING HOUSE, 12(27), PAGE 29 (JULY 4, 1966)

AN INDIVIDUAL BIOASSAY AVERAGED 30 MICROCURIES OF TRITIUM PER LITER FOR 7 DAYS, DUE TO TWO CONTINGENCIES NOT FORESEEN (IMPROPER HANDLING OF LEAKING TRITIUM-FILLED GLASS TUBES, AND BEING TOO CLOSE TO A LEAKING GAS-FILLING PORT).

*PERSONNEL EXPOSURE, RADIATION + *INCIDENT, NONREACTOR + FAILURE, ADMINISTRATIVE CONTROL

011796
GRAY PL
IN-SITU REPAIRS IN THE HEAVY WATER COMPONENTS TEST REACTOR
SAVANNAH RIVER LABORATORY E. I. DU PONT DE NEMOURS AND COMPANY, AIKEN, SOUTH CAROLINA
8 PAGES, 7 FIGURES, 4 REFERENCES, NUCLEAR APPLICATIONS 2(3), PAGES 213-220, JUNE 1966

BRIEFLY DESCRIBES THE PROCEDURE USED TO REPAIR AND MODIFY A GAS BAFFLE IN THE HWCTR. THE REPAIR WAS PERFORMED BY PLACING PERSONNEL, IN A SHIELDED BASKET, WITHIN 3-1/2 FT OF THE REACTOR CORE WHILE IRRADIATED FUEL REMAINED IN THE REACTOR. RADIATION DOSES TO PERSONNEL WAS HELD AT OR BELOW 140 MR. BY PROVIDING TWO-PIECE SUITS AND A SIMPLE VENTILATION SYSTEM, PROTECTION FROM INHALATION OF TRITIUM WAS PROVIDED. THE REPAIRS WERE COMPLETED IN 20 DAYS.

FAILURE, COMPONENT + REACTOR, HWR + HWCTR (TR) + INHALATION + *MAINTENANCE AND REPAIR + REACTOR, PWR + RADIATION SAFETY AND CONTROL

014080
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION
NEW ENGLAND NUCLEAR CORPORATION
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(3) PAGES 20-21 (JANUARY 16, 1967)

(LETTER NOVEMBER 22) A CHEMIST RECEIVED 0.46 REM TRITIUM DOSE AFTER THE BREAKING OF A GLASS REACTION VESSEL BY A STIRRING BAR, WHILE INCORPORATING 175 CURIES OF TRITIUM INTO A PLASTIC.

FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION

014427
CAIRE R + SUTRA-FOURCADE Y
STUDY OF THE PERMEABILITY OF CERTAIN MATERIALS TO TRITIUM
COMMISSARIAT A LENERGIE ATOMIQUE, CENTRE DE PRODUCTION DE PLUTONIUM DE MARCOULE
CEA-R-3018 +. 20 PAGES, AUGUST 1966, IN FRENCH

THE AIM OF THIS WORK IS TO CLASSIFY CERTAIN MATERIALS INTENDED FOR USE AS A PROTECTION AGAINST GASEOUS TRITIUM AND TRITIATED WATER. THE FIRST PART DEALS WITH ACTIVE TESTS AND GIVES AN ACCOUNT OF PHENOMENA ENCOUNTERED WITH VERY SMALL QUANTITIES OF ELEMENT. THE SECOND PART OF THIS REPORT CONCERNS A SERIES OF TESTS MADE WITH HELIUM AND INACTIVE WATER. GASEOUS TRITIUM WAS USED FOR THE FIRST PART OF THE WORK WITHOUT A CARRIER, AND IT WAS NOT POSSIBLE TO HANDLE IT IN WEIGHABLE AMOUNTS. AT A CONCENTRATION OF ONE MCI/CUBIC METER, ONE HAS THEREFORE 10-7 GM/CUBIC METER OF TRITIUM. UNDER THE SAME CONDITIONS, AT NORMAL PRESSURE, A CUBIC METER OF HYDROGEN WEIGHS 900 GM. THE AMOUNTS HANDLED DURING THE ACTIVE TESTS ARE 10 TO THE 10TH TIMES LESS THAN THOSE WHICH WOULD HAVE BEEN USED IN THE CASE OF HYDROGEN AT NORMAL PRESSURE.

AVAILABILITY - MICROCARD EDITIONS, INC. (FOR SALE) ACCOUNTING AND SHIPPING DEPARTMENT, WEST SALEM, WISCONSIN 54669

PERSONNEL PROTECTIVE DEVICE

015081
JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967
JOHN HOPKINS UNIVERSITY, BALTIMORE
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGE 34, (MARCH 13, 1967)

JOHNS HOPKINS REPORTS FEB. 21, THAT 10 CURES OF TRITIUM (IN URANIUM HYDRIDE) WERE RELEASED AS A GLASS TUBE BROKE AND THE UH BURNED SPONTANEOUSLY. TWO PERSONS WERE EXPOSED TO 3 MPC AIR, URINE SPECIMENS PEAKED AT 0.1 MPC. VENTILATION SYSTEM SPREAD AIR CONTAMINATION THROUGHOUT BUILDING. INCIDENT OCCURRED AT 6 PM.

*INHALATION + *VENTILATION SYSTEM + *INCIDENT + *PERSONNEL EXPOSURE, RADIATION

015083
TRITIUM EXPOSURE AT US RADIUM CORP., DEC. 13, 1966
U.S. RADIUM CORPORATION
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGES 35-36, (MARCH 13, 1967)

U.S. RADIUM CORP. REPORTS JAN. 24 THAT AN R AND D SCIENTIST BREATHED AIR CONTAINING TRITIUM FROM A LEAKY GLASS TUBE FILL FACILITY. LATE REPORTING IS DUE TO ORIGINAL USE OF SUBMERSIBLE TRITIUM MPC (WHICH INDICATED NO OVEREXPOSURE). IF THE SOLUBLE MPC VALUE IS USED, ASSUMING OXIDATION HAD TAKEN PLACE, AN OVEREXPOSURE OCCURRED. IN ADDITION, AN ION CHAMBER INDICATED 100 TIMES HIGHER THAN AN IMPINGER SAMPLE.

*FAILURE, EQUIPMENT + INHALATION + MPC + *INCIDENT, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION

015084
TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967
U.S. RADIUM CORPORATION
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGE 36, (MARCH 13, 1967)

U.S. RADIUM CORP., JAN. 25, REPORTS THAT A DIAL PAINTER WAS EXPOSED TO 1.46 MPC, DUE TO (1) AN ACCUMULATION OF FRESHLY PAINTED DIALS NEXT TO THE MACHINE, (2) RESIDUAL CONTAMINATION OF SAMPLING-TRAIN COMPONENTS (DRY GAS METER). THE MACHINE IS COMPLETELY ENCLOSED AND KEPT AT MINUS 3 INCHES (WATER) PRESSURE, ALTHOUGH THE AIR FLOW IS BARELY PERCEPTIBLE.

*GLOVE BOX + VENTILATION SYSTEM + INCIDENT + *PERSONNEL EXPOSURE, RADIATION + FAILURE, DESIGN ERROR + FAILURE, ADMINISTRATIVE CONTROL

016308
NICHOLS DC
RADIOLOGICAL PROTECTION IN A TRITIUM SEPARATIONS FACILITY
SAVANNAH RIVER PLANT, AIKEN, S.C.
DPSPU-65-30-31 + CONF-660403-1 +. 8 PAGES, JANUARY 1966, FROM INTERNATIONAL SYMPOSIUM ON RADIOLOGICAL PROTECTION OF THE WORKER BY THE DESIGN AND CONTROL OF HIS ENVIRONMENT, BOURNEMOUTH, ENGLAND

THE SAVANNAH RIVER PLANT IS THE MAJOR CENTER OF TRITIUM PRODUCTION IN THE U.S. TRITIUM IS PRODUCED BY NEUTRON IRRADIATION OF LITHIUM IN THE REACTORS AND IS SUBSEQUENTLY SEPARATED FROM THE LITHIUM TARGET ELEMENTS. RADIOLOGICAL PROTECTION WAS ONE OF THE FOREMOST OBJECTIVES IN THE DESIGN OF THE SEPARATIONS FACILITY AND IN THE PREPARATION OF OPERATING PROCEDURES. CONSEQUENTLY, CONTROL OF RADIOLOGICAL HEALTH HAZARDS IS RELATIVELY SIMPLE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

HEAVY WATER + INHALATION + MPBB + *SAVANNAH RIVER PLANT + PERSONNEL EXPOSURE, RADIATION + *RADIOCHEMICAL PLANT SAFETY + RADIOCHEMICAL PROCESSING + *RADIOISOTOPE + RADIOLOGICAL ASSISTANCE

017118
JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE
JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(33), PAGE 25 AND 26 (AUGUST 14, 1967)

(LETTER, JUNE 6) INSPECTION AFTER A RELEASE OF 30 CURIES OF TRITIUM INTO AN UNRESTRICTED LAB ON FEBRUARY 20 REVEALED (1) TRITIUM POSSESSED, BUT NO VALID AEC LICENSE, (2,3) SURVEYS FOR AIRBORNE TRITIUM WERE INADEQUATE, (4) TWO INDIVIDUALS WERE EXPOSED TO ABOVE MPC FOR TRITIUM, (5-7) TRITIUM WAS STORED IN AN UNRESTRICTED, UNPOSTED AREA AND RECORDS NOT KEPT, (8) THE EXPOSURE IN ITEM 4 AND THE RELEASE ITSELF WERE NOT REPORTED IN WRITING. THERE APPEARS TO BE A LACK OF CENTRAL CONTROL OF PROCUREMENT AND USE OF BY-PRODUCT MATERIAL, WITH NO ONE ASSIGNED OVERALL RESPONSIBILITY TO ENSURE COMPLIANCE WITH LICENSES.

*AIRBORNE RELEASE + COMPLIANCE + *INCIDENT + RADIATION SAFETY AND CONTROL + FAILURE, ADMINISTRATIVE CONTROL

018170
SUTER F
PVC SUITS FOR PERSONAL PROTECTION AGAINST RADIOACTIVE CONTAMINATION
6 PAGES, 13 FIGURES, 2 TABLES, ATOMPRAXIS 13(4/5), PAGE 180 THRU 185, (APRIL/MAY 1967)

018170 *CONTINUED*
THE SUITS ARE USED BY OPERATORS WHO MUST BE PROTECTED AGAINST RADIOACTIVE CONTAMINATION. THE PRESSURE SUITS WITH CLEAN AIR SUPPLY ARE ESPECIALLY WORN IN PRESENCE OF TRITIUM. THE PHYSIOLOGICAL CONDITIONS EXISTING IN THE PRESSURIZED SUITS AND THEIR PERMEABILITY FOR TRITIUM HAVE BEEN STUDIED.

BIOMEDICAL + *PERSONNEL PROTECTIVE DEVICE + *RADIATION SAFETY AND CONTROL

021995
BUSH WR
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-2756 + CONF-670218-1 +. 17 PAGES, 6 FIGURES, 4 TABLES, 7 REFERENCES, JULY 1967, PRESENTED AT SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL, ALBUQUERQUE, N. MEX.

THE GROWTH OF THE TRITIUM (HTO) HAZARD IN THE NRU REACTOR BUILDING IS REVIEWED, AND THE METHODS AND EXPOSURE GUIDES INTRODUCED TO KEEP THE HAZARD UNDER CONTROL ARE OUTLINED. HTO INTAKES ARE CLASSIFIED AS REMOVAL, CAUTION, MINOR, OR NEGLIGIBLE, DEPENDING ON THE HTO CONCENTRATION IN URINE. REMOVAL EXPOSURES (20 MICROCURIES/LITER) ARE INVESTIGATED, AND A REPORT OF THE EXPOSURE INCIDENT IS DISTRIBUTED TO ALL BRANCHES. THE AVERAGE HTO DOSE RECEIVED IN 50 REMOVAL EXPOSURES IN 1966 WAS 230 MREM, RECEIVED MOSTLY FROM MINOR AND NEGLIGIBLE EXPOSURES. OUR LARGEST HTO EXPOSURE RESULTED IN A DOSE OF 4700 MREM, AND 19 OTHER SINGLE EXPOSURES HAVE EXCEEDED 500 MREM. MOST OF THESE RESULTED FROM INTAKE OF HTO VAPOUR THROUGH THE UNWETTED SKIN OF MEN WEARING AIR-SUPPLIED MASKS AND COTTON COVERALLS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

ADSORPTION + BIOMEDICAL + CANADA + *DOSE + *REACTOR, HWR + *DOSE CALCULATION, INTERNAL + CHALK RIVER + RADIOBIOLOGY

024354
COFFIN DO
SOME (SECOND) THOUGHTS ON TRITIUM CONTAMINATION
LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO
LA-DC-7996 + CONF 660621-6 +. 12 PAGES, 1966

EMPHASIZES THAT PLASTIC BAGS SHOULD NOT BE USED WHEN DEALING WITH TRITIUM LEAKAGE OR CONTAMINATION. IN A FEW HOURS A PLASTIC BAG CAN RAISE THE PERSONNEL EXPOSURE RATE FROM A CONTAMINATED OBJECT A THOUSANDFOLD.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA $3.00 COPY, $0.65 MICROFICHE

*TRANSPORTATION AND HANDLING + *CONTAMINATION + LEAK RATE

024740
OSBORNE RV
STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT CRNL
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER (ONTARIO). CHALK RIVER NUCLEAR LABS.
AECL-2699 + CONF-670218-2 +. 19 PAGES, 13 FIGURES, 7 REFERENCES, NOV. 1967, FROM SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL, ALBUQUERQUE, N. MEX.

IONIZATION CHAMBERS AND PLASTIC SCINTILLATION DETECTORS ARE USED TO MEASURE TRITIATED WATER (HTO) VAPOUR IN AIR DOWN TO 0.5 MICROCURIE/CU. METER. THEIR RESPONSES TO GAMMA BACKGROUND ARE REDUCED 98% BY SUBTRACTING THE IONIZATION CURRENT FROM A CONCENTRIC SEALED IONIZATION CHAMBER AND BY SCINTILLATION PULSE HEIGHT ANALYSIS. THE PENETRATION OF HTO THROUGH HUMAN SKIN HAS BEEN STUDIED EXPERIMENTALLY BY EXPOSING VOLUNTEERS TO HTO VAPOUR. RESPIRATORS WITH CHARCOAL FILTERS HAVE BEEN SHOWN TO HOLD UP PASSAGE OF HTO VAPOUR. AN AUTOMATIC URINALYSER ALLOWS WORKERS TO MEASURE THEIR OWN BODY BURDENS OF TRITIUM IN TWO MINUTES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

CANADA + *MONITOR, AIR + CHALK RIVER + *CONCENTRATION + MAN + RADIATION MONITORS

026087
INTERNAL EXPOSURE OF CHEMIST TO TRITIUM
NEW ENGLAND NUCLEAR CORP., ALBANY ST., BOSTON, MASS.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(25), PAGE 19, (JUNE 17, 1968)

(LETTER, MAY 8) ON APRIL 4, A JUNIOR CHEMIST WAS SYNTHESIZING AN ORGANIC COMPOUND CONTAINING TRITIUM IN A HOOD UNDER VACUUM WITH A GAS CHROMATOGRAPH. HE RECEIVED A CALCULATED INTERNAL WHOLE-BODY EXPOSURE OF 662 MREM FROM TRITIUM AND CARBON-14. EXPOSURE WAS FROM MULTIPLE CAUSES - (1) LOOSENING OF FAN BELTS, (2) PLACING HEAD IN THE HOOD, (3) POSSIBLE FATIGUE OF RUBBER TUBING AND LEAKS. A NEW FACE DESIGN FOR HOOD WILL PREVENT ENTRY OF HEAD. RUBBER TUBING WILL BE CHANGED OFTENER. CHROMATOGRAPH EXIT PORTS WILL BE DIRECTED TO THE SIDE OF HOOD RATHER THAN TO PORT.

GLOVE BOX + FAILURE, OPERATOR ERROR + *INHALATION + *VENTILATION SYSTEM + *PERSONNEL EXPOSURE, RADIATION + *RADIOISOTOPE

028560
ABERLE JA + MACDONALD AR + PORTER SW
A PROCEDURE FOR MINIMIZING PERSONNEL HAZARDS WHILE CHANGING TRITIUM TARGETS IN ACCELERATORS
ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE, DEFENSE ATOMIC SUPPORT AGENCY, BETHESDA, MARYLAND
AFRRI-TM66-5 +. 17 PAGES, 12 FIGURES, 7 REFERENCES, MAY 1966

DESCRIBES STEP-BY-STEP PROCESS UTILIZING STAINLESS-STEEL GLOVE BOX AND AN ALTERNATE USING A PLASTIC CONTAINMENT AREA. PROCEDURE IS APPLICABLE ONLY TO THE PARTICULAR TYPE OF ACCELERATOR, BUT PROCEDURE EMPHASIZES POSSIBLE HAZARDS AND THE METHODS USED TO CONTROL THEM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, $3.00 COPY, $0.65 MICROFICHE

GLOVE BOX + *PROCEDURES AND MANUALS + *RADIATION SAFETY AND CONTROL + *ACCELERATOR

033310
KATOH J + OHUCHI M
MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE OF POLYMERIC FILMS
JAPAN ATOMIC ENERGY RESEARCH INST., TOKYO
7 PAGES, HOKEN BUTSURI, 3, PAGES 288-294 (JUNE 1968) (IN JAPANESE)

IN HANDLING RADIOACTIVE MATERIALS, VARIOUS KINDS OF PROTECTIVE CLOTHING MADE OF POLYMERIC FILMS ARE USED FOR PROTECTION. THE PERMEATION RATE OF TRITIATED HEAVY WATER AND ITS VAPOR THROUGH POLYMERIC FILM, SUCH AS PVC, POLYETHYLENE, AND RUBBER WAS MEASURED BY USING AN IONIZATION CHAMBER WITH A VIBRATING REED ELECTROMETER. ON THE BASIS OF THE RESULTS OBTAINED, INTERNAL EXPOSURE OF THE PERSON WEARING THE PROTECTIVE CLOTHING IS EVALUATED AND DISCUSSED.

CHAMBER, ION + *HEAVY WATER + *MEASUREMENT + *PERSONNEL PROTECTIVE DEVICE + *CONTAMINATION + MATERIAL + PERSONNEL EXPOSURE, RADIATION + RADIOISOTOPE + *FILM + *SAFETY EVALUATION + *PLASTICS

040036
BILLARD F + CHARAMATHIEU A + MOREL P
PERMEABILITY OF FABRICS IN CONTACT WITH TRITIUM AND TRITIATED WATER
COMMISSARIAT A L/ENERGIE ATOMIQUE, FONTENAY-AUX-ROSES (FRANCE)
CEA-CONF-1168 + CONF-681013-9 +. 29 PAGES, 1968, FROM 1ST EUROPEAN CONGRESS ON RADIATION PROTECTION AND EXHIBITION ON EQUIPMENT USING LOW ENERGY AND SHORT RANGE RADIATION DOSIMETRY, MENTON, FRANCE (IN FRENCH)

BY MEASUREMENT OF THE ACTIVITIES OF TRITIUM IN TWO IONIZATION CHAMBERS SEPARATED BY A MEMBRANE AND BY USE OF THE RESULTS FROM A MODIFIED BARRER METHOD, IT WAS POSSIBLE TO CLASSIFY FABRICS BY DECREASING PERMEABILITY TO TRITIUM AND TRITIATED WATER IN THE MANUFACTURE OF PROTECTIVE CLOTHING OR GLOVES FOR GLOVE BOXES AND TO SELECT THE BEST OF THE FABRICS.

*GLOVE BOX + *TESTING + TRACER, RADIOACTIVE + *ANALYTICAL TECHNIQUE + CALIBRATION

042995
SUTRA-FOURCADE Y
MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM
CEA-R-3350 + WAPD-TRANS-0102 +. 35 PAGES, DECEMBER 1967

DISCUSSES THE PROBLEMS POSED BY TRITIUM - ITS DETECTION, APPARATUS USED, PROTECTION OF PERSONNEL IN AN ATMOSPHERE CONTAMINATED WITH TRITIUM, THE DIFFUSION OF TRITIUM IN THE ATMOSPHERE, DECONTAMINATION, ETC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

DECONTAMINATION + ATMOSPHERIC DIFFUSION + ATMOSPHERIC POLLUTION + CONTAMINATION + PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + RADIATION MONITORS

044916
REDUCTION OF TRITIUM CONCENTRATION RELEASED TO UNRESTRICTED AREAS
THEODORE R. SCHWALM, INC.
2 PAGES, LETTER - THEODORE 4. SCHWALM, INC. TO DIVISION OF COMPLIANCE (AEC) - MARCH 19, 1970

1969 AVERAGE CONCENTRATION RELEASED TO UNRESTRICTED AREAS WAS 0.81 X 10(-6TH) MICROCURIE/CC WHICH IS 4 TIMES MPC (AIR). RUNNING STACK FAN CONTINUOUSLY NOW TO GET AN ADDITIONAL DILUTION FACTOR OF 4.2. VARIOUS MEASUREMENTS ARE BEING MADE TO STUDY THE DIFFUSION OF TRITIUM AFTER IT LEAVES THE STACK. A MODIFICATION TO THE STACK IS PROPOSED TO INCREASE DILUTION FACTOR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + CONCENTRATION, MAXIMUM + DIFFUSION + BYPRODUCT MATERIAL + *VENTILATION SYSTEM + STACK + AIR

044916 *CONTINUED*
+ WASTE DISPOSAL, GAS + EQUIPMENT DESIGN + *OPERATING EXPERIENCE + *OFF SITE

061931
BUTLER HM + HAYWOOD FF
RADIATION SAFETY PRACTICES - OPERATION HENRE
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CEX-65.05 +. 34 PAGES, APRIL 1970

DURING 1967 AN EXPERIMENT WAS CONDUCTED AT THE NEVADA TEST SITE USING A HIGH-YIELD-NEUTRON GENERATOR SUPPORTED AT SEVERAL ELEVATIONS ON A 1527-FT STEEL TOWER. NUMEROUS PERSONNEL RADIATION HAZARDS WERE ASSOCIATED WITH THE ROUTINE OPERATION OF THIS GENERATOR, AND SPECIALIZED EQUIPMENT AND PROCEDURES WERE REQUIRED. THE MOST NOTABLE HAZARD RESULTED FROM HANDLING TARGETS FOR THE GENERATOR, EACH OF WHICH CONTAINED 1500 TO 2000 CI OF 3H. HANDLING WAS REQUIRED FOR TARGET FABRICATION, PACKING AND SHIPPING, MOUNTING ONTO GENERATOR, REMOVAL AND TRANSFER TO STORAGE, AND DISPOSAL OF WASTES. THIS REPORT INCLUDES AREA MONITORING AND BIO-SAMPLING TECHNIQUES, INTERNAL-DOSE ESTIMATION, AND SPECIFIC PROCEDURES FOR LIMITING PERSONNEL EXPOSURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HAZARD, RELATIVE + *TESTING + TRANSPORTATION AND HANDLING + *WASTE DISPOSAL + WASTE STORAGE + SAMPLING + DOSE CALCULATION, INTERNAL + *NEVADA TEST SITE + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + MONITOR, AREA

064725
BUSH WR
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER NUCLEAR LABORATORY, CANADA
AECL-2756 +. 17 PAGES, 6 FIGURES, 3 TABLES, 7 REFERENCES, 1967

MOST OF THE EXPOSURES RESULTED FROM INTAKE OF HTO VAPOUR THROUGH THE UNWETTED SKIN OF MEN WEARING AIR-SUPPLIED MASKS AND COTTON OVERALLS, WHERE DTO IS EXPOSED TO THE AIR IN VICINITY OF THE NRU REACTOR WHICH IS WATER-COOLED, D2O MODERATED. AVERAGE HTO ABOVE THE REACTOR WAS 0.17 (MPC)A IN 1964-5, A STANDARD MAN RECEIVING 850 MREM/YR FROM SUCH A CONCN, 40 HR/WK, BUT SINCE REAL MEN ABSORB HTO ONLY HALF AS FAST (NSIC NO. 561591), AND WORK 30 HR/WK, THEY SHOULD HAVE RECEIVED 320, BUT ACTUALLY GOT 120 MREM/YR, IN AREAS AVERAGING LESS THAN OVER THE REACTOR, 5000 MREM/YR BEING THE LIMIT SET BY CANADIAN LAW. AVERAGE DOSES TO NRU OPERATING PERSONNEL IN 1966 WERE 700 MREM FROM HTO + 1.2 R FROM GAMMA RAYS, AVERAGE HTO DOSE RECEIVED BY 50 MEN REMOVED FROM EXPOSURE AREAS BEING 230 MREM. MEN ARE REMOVED FROM FURTHER HTO EXPOSURE IF THEIR URINE CONTAINS 20 MICROCURIES PER LITER OR MORE AND KEPT AWAY UNTIL URINE LEVEL DROPS TO 6 UCI/L (USUALLY 3 WKS). MEN WITH 7 TO 10 UCI/L ARE CLASSIFIED AS HAVING MINOR HTO CONTAM. AIR-SUPPLIED MASKS WORN IF ANTICIPATED DAILY EXPOSURE EXCEEDS 8(MPC)A HOURS, BUT NOT ALWAYS WHEN HTO CONCN WAS ONLY 2 OR 3 PICOCURIES PER LITER OF D2O. ROUGHLY EQUAL AMTS OF HTO ARE ABSORBED THROUGH SKIN AND LUNGS, 16(MPC)A-HOURS PERMISSIBLE WITH MASKS.

CANADA + CODES AND STANDARDS + OXIDE + DOSE CALCULATION, INTERNAL + PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *EXCRETION, URINE + EXPOSURE, SKIN + MAN + LEGISLATION

065205
COWAN FP
POLICY AND PRACTICE FOR ACCELERATOR RADIATION SAFETY
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
10 PAGES, NUCLEAR SAFETY, 10(6), PAGE 483-491, (DECEMBER 1969)

AS ACCELERATORS GET INTO GEV RANGE (GREATER THAN 1000 MEV), PROBLEMS OF DOSIMETRY AND PERSONNEL PROTECTION BECOME MORE DIFFICULT. STRICT PERSONNEL-CONTROL MEASURES HAVE BEEN ESTABLISHED FOR VAULTS AND EXPERIMENTAL AREAS FOR ACCELERATORS AROUND THE COUNTRY. PROBLEMS OF AIR AND DUST ACTIVATION, EXTERNAL BEAMS, TRITIUM, AND TARGET HANDLING ARE ALSO ENCOUNTERED. ALTHOUGH THERE SHOULD BE NO COMPROMISE WITH SAFETY, PROTECTIVE ARRANGEMENTS SHOULD BE SCALED TO DEGREE OF HAZARD AND LOCAL CIRCUMSTANCES. ARTICLE IDENTIFIES HOW GOOD RESULTS ARE BASED ON APPLICATION OF TECHNICAL ABILITY AND GOOD COMMON SENSE IN PLANNING, CONSTRUCTION, AND OPERATION.

CONTAINMENT DESIGN + MONITOR, PERSONNEL + PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + *SAFETY PRINCIPLES AND PHILOSOPHY + EQUIPMENT DESIGN + *ACCELERATOR + SAFETY PROGRAM + MONITORING SYSTEM, RADIATION + CONSTRUCTION

075763
SCAGGS RA
SAFETY SUMMARY REPORT - LP-12 TRITIUM CONTAINER (PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS)
DU PONT DE NEMOURS (E.I.) AND CO.
DPSPU-72-124-2 +. 43 PAGES, FIGURES, TABLES, REFERENCES, MAY 1972

ELEMENTAL TRITIUM IS SHIPPED AT LOW PRESSURE IN AN INSULATED CONTAINER IN COMPLIANCE WITH REGULATIONS SET FORTH IN DEPARTMENT OF TRANSPORTATION, TITLE 49, PARTS 173-178. THE PACKAGE IS NOT A RADIOLOGICAL HAZARD UNDER NORMAL OR HYPOTHETICAL ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

075763 *CONTINUED*
FIRE + *SHIPPING CONTAINER + TESTING + *IMPACT SHOCK + SYSTEM DESCRIPTION + *REGULATION, FEDERAL + INSULATION

075872
ROGERS RF + SCAGGS RA
SAFETY SUMMARY REPORT - LP-50 TRITIUM CONTAINER - PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS. FINAL REPORT
DU PONT DE NEMOURS (E.I.) AND CO., SOUTH CAROLINA
DPSPU-72-124-1 +. 48 PAGES, FIGURES, TABLES, REFERENCES, MAY 1972

ELEMENTAL TRITIUM IS SHIPPED AT LOW PRESSURE IN AN INSULATED CONTAINER IN COMPLIANCE WITH AEC MANUAL CHAPTER 0529 (AECM 0529), SAFETY STANDARDS FOR THE PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS. THE PACKAGE IS NOT A RADIOLOGICAL HAZARD UNDER NORMAL OR HYPOTHETICAL ACCIDENT CONDITIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFETY REVIEW + *SHIPPING CONTAINER

075963
HANNAHS BJ + KERSHNER CJ
BIBLIOGRAPHY ON HANDLING CONTROL AND MONITORING OF TRITIUM (DEC. 1968-JAN. 1972)
MOUND LABORATORY, OHIO
LML-1946 +. 44 PAGES, SEPTEMBER 5, 1972

AN ANNOTATED BIBLIOGRAPHY PREPARED TO PROVIDE A SOURCE OF INFORMATION ON RECENT LITERATURE ON SUBJECTS RELATING TO THE CONTROL, MONITORING, AND HANDLING OF TRITIUM. PARTICULAR EMPHASIS WAS PLACED ON LITERATURE THAT RELATES TO THE TRITIUM HANDLING AND CONTROL NEEDS OF THE DIVISION OF MILITARY APPLICATIONS/USAEC. THE PERIOD COVERED BY THIS BIBLIOGRAPHY EXTENDS FROM 1968 TO JANUARY 31, 1972, AND INCLUDES BOTH JOURNAL AND REPORT LITERATURE. KEYWORD AND AUTHOR INDEXES ARE PROVIDED AND A SPECIAL SUBJECT-GROUPING FORMAT FOLLOWED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIBLIOGRAPHY + TRANSPORTATION AND HANDLING + *MONITOR + RADIATION SAFETY AND CONTROL + MILITARY CONSIDERATION + AGENCY, AEC

075918
FRANZEN LF
DESIGN AND PRODUCT IMPROVEMENT FOR NUCLEAR POWER PLANTS WITH VIEW TO ENVIRONMENT PROTECTION
INSTITUT FUR REAKTORSICHERHEIT DER TECHNISCHEN, GERMANY
6 PAGES, 2 FIGURES, 21 REFERENCES, KERNTECHNIK, 14(10), PP. 466-471 (OCTOBER 1972)

BRIEF DISCUSSION OF THE DEVELOPMENT OF NEW PROCEDURES TO FACILITATE REDUCTION OF KRYPTON 85 RELEASES BY SEPARATION AND STORAGE.

KRYPTON + RADIOACTIVITY RELEASE + *ENVIRONMENT + FISSION PRODUCT RETENTION + *FUEL REPROCESSING + *POWER PLANT, NUCLEAR

077462
WATSON JS
A SUMMARY OF TRITIUM HANDLING PROBLEMS IN FUSION REACTORS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4022 +. 21 PAGES, 2 FIGURES, 7 REFERENCES, NOVEMBER 1972

THE PROBLEMS IN HANDLING TRITIUM IN THERMONUCLEAR REACTORS ARE REVIEWED AND ASSESSED. THE MOST DIFFICULT PROBLEMS APPEAR TO BE ASSOCIATED WITH RECOVERY OF TRITIUM FORMED OR BRED IN THE BLANKET OF D-T REACTORS. THE NEED TO CONTROL THE RATE OF TRITIUM LEAKAGE TO THE STEAM SYSTEMS AND THUS TO THE ENVIRONMENT IMPOSES SEVERE LIMITATIONS ON ALLOWABLE TRITIUM CONCENTRATIONS AND PRESSURES IN BOTH THE BLANKET AND SECONDARY COOLANT FLUIDS. POSSIBLE TRITIUM RECOVERY PROCESSES ARE REVIEWED AND EVALUATED USING THE FRAGMENTARY DATA CURRENTLY AVAILABLE. THE MOST PROMISING PROCESSES FOR RECOVERY FROM LITHIUM OR MOLTEN FLUORIDE BLANKET FLUIDS OR FROM POTASSIUM OR HELIUM COOLANTS ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COOLANT PURIFICATION SYSTEM + CONTAINMENT LEAKAGE CONTROL + LEAK RATE + LEAK + PERMSELECTIVE MEMBRANE + REACTOR, THERMONUCLEAR

078272
STEINBERG R + ALGER DL
A NEW PUMPING SYSTEM FOR A 150-KILOVOLT NEUTRON GENERATOR TO REDUCE THE PRESENT TRITIUM HAZARD
NATIONAL AERONAUTICS AND SPACE ADMIN., LEWIS RESEARCH CENTER
BRH/DEP 73-2 +. 40 PAGES, FIGURES, OCTOBER 1972

A NEW VACUUM PACKAGE INCORPORATING A TITANIUM BULK SUBLIMATOR/ION PUMP COMBINATION WAS DESIGNED, BUILT, AND EVALUATED ON A TYPICAL 150-KILOVOLT NEUTRON GENERATOR. THE SUBLIMATOR/ION-PUMP SYSTEM HAS THE FOLLOWING OPEATING ADVANTAGES - (1) OVER 95% OF THE TRITIUM RELEASED FROM THE TARGET

078272 *CONTINUED*
DURING DEUTERON BOMBARDMENT IS PERMANENTLY BURIED: (2) A RAPID PUMPDOWN TIME IS OBTAINED ROUTINELY: (3) THE NEW VACUUM SYSTEM IS ABLE TO HANDLE LARGE ACTIVE GAS LOADS: (4) NEUTRON-GENERATOR OPERATING PRESSURE MAY BE REGULATED BETWEEN 10(EXP -7) AND 10(EXP -5) TORR; AND (5) THE INTERMITTENT SUBLIMATION PERMITS OPTIMUM USE OF AVAILABLE TITANIUM, THUS INCREASING PUMP LIFE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ION EXCHANGE + NEUTRON + SYSTEM DESCRIPTION + IRRADIATION FACILITY + EQUIPMENT DEVELOPMENT + PUMPS

078445
SCAGGS RA
SAFETY SUMMARY REPORT - TRITIATED HEAVY WATER SHIPMENTS UNDER SPECIAL CONDITIONS (PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS)
E.I. DU PONT DE NEMOURS AND CO., AIKEN, SOUTH CAROLINA
DPSPU-71-124-2 +. 18 PAGES, FEBRUARY 1971

DRUMS OF TRITIATED HEAVY WATER ARE SHIPPED IN REFRIGERATED RAILWAY CARS IN A MANNER THAT PROTECTS PUBLIC HEALTH AND SAFETY. BECAUSE DROP AND THERMAL TESTS ON THE RAILWAY CAR ARE IMPRACTICAL, EACH SHIPMENT IS ACCOMPANIED BY AT LEAST TWO DESIGNATED ESCORTS WHOSE FUNCTION IS TO PROVIDE ADMINISTRATIVE CONTROLS AND TO ASSIST AUTHORITIES IN THE EVENT OF FIRE, ACCIDENT, LEAKAGE, OR UNUSUAL DELAY INVOLVING THE SHIPMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ADMINISTRATIVE CONTROL + FIRE + *HEAVY WATER + *SHIPPING CONTAINER + ACCIDENT, TRANSPORTATION + *LEAK

079235
WERNER RW + CARLSON GA + LEE JD, ET. AL
PROGRESS REPORT NO. 1 ON THE DESIGN CONSIDERATIONS FOR A LOW POWER EXPERIMENTAL MIRROR FUSION REACTOR
LAWRENCE LIVERMORE RADIATION LABORATORY
UCRL-74054 + CONF-721111-13 +. 94 PAGES, PAPER PRESENTED AT INTERNATIONAL MEETING ON THE TECHNOLOGY OF CONTROLLED THERMONUCLEAR FUSION EXPERIMENTS AND THE ENGINEERING ASPECTS OF FUSION REACTORS, HELD IN AUSTIN, TEXAS ON NOVEMBER 20, 1972

THE DESIGN OF A 200-MWE MIRROR FUSION REACTOR IS DISCUSSED. THE ORDERLY DEVELOPMENT OF A CONSISTENT SET OF PLASMA PARAMETERS FORMS THE BASIS FOR DESIGN. THIS FIRST REPORT OF A SERIES PLACES MAJOR EMPHASIS ON DEVELOPING THE INTERACTION PARAMETERS BETWEEN SYSTEM ELEMENTS AND COMPONENTS. ITEMS DISCUSSED INCLUDE BLANKET THERMAL-HYDRAULIC DESIGN, TRITIUM RECOVERY, NEUTRONICS, CONSIDERATIONS IN EXPANDER AND COLLECTOR DESIGN AND NEUTRON STREAMING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HYDRAULIC ANALYSIS + THERMAL ANALYSIS + THERMAL MECHANICAL EFFECT + *DESIGN STUDY + NEUTRON + *REACTOR, THERMONUCLEAR + EQUIPMENT DEVELOPMENT

082135
SAVORNIN J
PROTECTIVE EQUIPMENT FOR PERSONNEL WORKING IN CONTAMINATED ENVIRONMENTS
FRENCH PATENT 2,112,034 +. 7 PAGES, JUNE 16, 1972

RADIOPROTECTIVE EQUIPMENT FOR PERSONNEL WORKING IN A TRITIATED ENVIRONMENT IS DESCRIBED. THIS EQUIPMENT INCLUDES A PROTECTIVE SUIT MADE OF A VINYL MATERIAL PROVIDED WITH A MEANS FOR ITS VENTILATION. THIS VENTILATION IS ACCOMPLISHED WITH A SINGLE TUBE WHICH SERVES FOR THE AIR INLET INTO THE SUIT AND THE SUBSEQUENT EXTRACTION OF THE EXPIRED AIR (USING AN ASPIRATOR). THE BACK OF THE SUIT IS PROVIDED WITH A ZIPPER CLOSING A SLIT WHICH EXTENDS FROM ONE ELBOW TO THE OTHER. THE EQUIPMENT IS ALSO PROVIDED WITH SEAMS OF VINYL MATERIAL WELDED TO THE SUIT WHICH EXTEND ALONG THE ENTIRE LENGTH OF THE SLIT AND/OR EACH JOINT, THIS SEAM BEING OF SUCH A SIZE AS TO ENABLE IT TO BE PARTIALLY COVERED. THESE SEAMS ARE WELDED TOGETHER TO FORM LEAKTIGHT JOINTS. (IN FRENCH)

AVAILABILITY - FOREIGN PATENTS MAY BE OBTAINED IN PHOTOCOPY FROM THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

FRANCE + *PERSONNEL PROTECTIVE DEVICE + *VENTILATION SYSTEM + *CONTAMINATION + PATENT + PERSONNEL PROTECTIVE CLOTHING

082225
MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY
U.S. ATOMIC ENERGY COMMISSION, TECHNICAL INFORMATION CENTER
TID-3337 +. 100 PAGES, MAY 1973

A SELECTED BIBLIOGRAPHY OF 351 REFERENCES ON TRITIUM. THE REFERENCES WERE RETRIEVED FROM NSA DATA BASE BY COMPUTER SEARCH AND INDEXING. REFERENCES ARE ARRANGED IN A SOMEWHAT CHRONOLOGICAL ORDER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIBLIOGRAPHY + *WASTE DISPOSAL + MONITOR + RADIATION SAFETY AND CONTROL

082792
UNRUH CM
RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD PRACTICES
BATTELLE PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
BNWL-SA-3390 +. 56 PAGES, JULY 1970

REPORTS A MANUAL OF GOOD PRACTICES WHICH PROVIDES RADIATION PROTECTION GUIDANCE FOR WORKING WITH TRITIUM AND TRITIUM COMPOUNDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CODES AND STANDARDS + *GUIDE + *PROCEDURES AND MANUALS + REGULATION + *RADIATION SAFETY AND CONTROL

082793
SILVER WJ + CHEW MH
HEALTH PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE
LAWRENCE LIVERMORE RADIATION LABORATORY, CALIFORNIA
UCRL-71327 + CONF-690103-11 +. 23 PAGES, FIGURES, JANUARY 15, 1969

BUILDING 331 PROVIDES A FACILITY FOR CHEMISTRY DEPARTMENT PERSONNEL AT LAWRENCE RADIATION LABORATORY TO PERFORM EXPERIMENTAL WORK WITH VARIOUS RADIOACTIVE LIGHT ISOTOPES AND GASES. AN IMPORTANT RADIOACTIVE ISOTOPE HANDLED IN THIS FACILITY IS TRITIUM. THE FACILITY IS DESIGNED TO SAFELY HANDLE UP TO A MEGACURIE OF TRITIUM. THIS PAPER DEALS PRIMARILY WITH THE FEATURES AND CONTROLS INCORPORATED THAT PERMIT LRL PERSONNEL TO SAFELY HANDLE THESE LARGE QUANTITIES OF TRITIUM. THE BUILDING STAFF INCLUDES TWELVE SENIOR RESEARCHERS, FIVE EXPERIMENTAL TECHNICIANS, SIX MECHANICAL/ELECTRONIC TECHNICIANS, AND ONE RADIATION SAFETY TECHNICIAN. ADDITIONAL RADIATION SAFETY SUPPORT IS PROVIDED BY HEALTH PHYSICS ASSIGNED BY THE HAZARDS CONTROL DEPARTMENT TO SUPPORT THE CHEMISTRY DEPARTMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HEALTH PHYSICS TRAINING + HAZARD, RELATIVE + *LRL + *RADIATION SAFETY AND CONTROL + *RADIOLOGICAL ASSISTANCE

089425
MUSGRAVE BC
TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES
ALLIED CHEMICAL, NATIONAL REACTOR TESTING STATION
ICP-1041 +. 19 PAGES, 3 TABLES, 4 FIGURES, 8 REFERENCES, JANUARY 1974

TRITIUM WHICH IS PRODUCED FROM TERNARY FISSION IN NUCLEAR REACTORS WILL BE DILUTED AND DISPERSED THROUGHOUT THE AQUEOUS STREAMS IN THE FUEL REPROCESSING PLANTS. THE RANGES OF TRITIUM CONCENTRATIONS EXPECTED IN THE REPROCESSING PLANT STREAMS FOR DIFFERENT REACTOR TYPES ARE EXAMINED. THE REQUIREMENTS FOR TRITIUM CONTROL THROUGH RECYCLE AND ISOTOPE SEPARATION ARE DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT + FISSION GAS RELEASE + REACTOR, MOLTEN SALT + OCEAN AND SEA + SURFACE WATER + *WASTE DISPOSAL + WASTE MANAGEMENT + REACTOR, LWR + FUEL REPROCESSING + REACTOR, HTGR + REACTOR, LMFBR + JACOBS

094798
RHINEHAMMER TB + LAMBERGER PH
TRITIUM CONTROL TECHNOLOGY
MOUND LABORATORY, MIAMISBURG, OHIO
WASH-1269 +. 530 PAGES, FIGURES, DECEMBER 1973

THE PURPOSE OF THIS REPORT IS TO ASSEMBLE IN AN UNCLASSIFIED COMPENDIUM PERTINENT AEC CONTRACTOR AND PRIVATE INDUSTRY OPERATING EXPERIENCE WITH TRITIUM CONTAINMENT AND HANDLING, MONITORING, TRAPPING AND REMOVAL, AND STORAGE AND DISPOSAL SYSTEMS. THIS REPORT EMPHASIZES THE CAPABILITIES AND LIMITATIONS OF EXISTING TECHNOLOGY AND OPERATING TRITIUM CONTROL SYSTEMS AND DOES NOT DISCUSS CURRENT OR PROPOSED RESEARCH AND DEVELOPMENT PROGRAMS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

WASTE HANDLING + WASTE STORAGE + WASTE DISPOSAL, GAS + MONITORING SYSTEM, RADIATION + OPERATING EXPERIENCE + JACOBS

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH HAS KEYED TO IT.

ACCELERATOR
028560 P 5 065205 P 6
ACCIDENT, TRANSPORTATION
078445 P 8
ADMINISTRATIVE CONTROL
078445 P 8
ADSORPTION
021995 P 4
AGENCY, AEC
075963 P 7
AIR
044916 P 5
AIRBORNE RELEASE
017118 P 3 044916 P 5
ANALYTICAL TECHNIQUE
040036 P 5
ANIMAL, VERTEBRATE
064725 P 6
ATMOSPHERIC DIFFUSION
042995 P 5
ATMOSPHERIC POLLUTION
042995 P 5
BIBLIOGRAPHY
075963 P 7 082225 P 8
BIOMEDICAL
018170 P 3 021995 P 4
BYPRODUCT MATERIAL
044916 P 5
CALIBRATION
040036 P 5
CANADA
003269 P 1 021995 P 4 024740 P 4 064725 P 6
CHALK RIVER
021995 P 4 024740 P 4
CHAMBER, ION
033310 P 5
CODES AND STANDARDS
064725 P 6 082792 P 9
COMPLIANCE
017118 P 3
CONCENTRATION
024740 P 4
CONCENTRATION, MAXIMUM
044916 P 5
CONSTRUCTION
065205 P 6
CONTAINMENT DESIGN
065205 P 6
CONTAINMENT LEAKAGE CONTROL
077462 P 7
CONTAMINATION
010200 P 2 024354 P 4 033310 P 5 042995 P 5
082135 P 8
COOLANT PURIFICATION SYSTEM
077462 P 7
DECONTAMINATION
042995 P 5
DESIGN STUDY
079235 P 8
DIFFUSION
044916 P 5
DOSE
021995 P 4
DOSE CALCULATION, INTERNAL
021995 P 4 061931 P 6 064725 P 6
EFFLUENT
089425 P 9
ENVIRONMENT
075918 P 7
EQUIPMENT DESIGN
044916 P 5 065205 P 6
EQUIPMENT DEVELOPMENT
078272 P 7 079235 P 8
EXCRETION, URINE
064725 P 6
EXPOSURE, SKIN
064725 P 6
FABRICATION
005311 P 1
FAILURE, ADMINISTRATIVE CONTROL
010200 P 2 010561 P 2 015084 P 3 017118 P 3
FAILURE, COMPONENT
011796 P 2
FAILURE, DESIGN ERROR
015084 P 3
FAILURE, EQUIPMENT
015083 P 3
FAILURE, OPERATOR ERROR
009302 P 1 014080 P 2 026087 P 4
FILM
033310 P 5
FIRE
075763 P 6 078445 P 8
FISSION GAS RELEASE
089425 P 9
FISSION PRODUCT RETENTION
075918 P 7
FRANCE
082135 P 8
FUEL CONVERSION
005311 P 1
FUEL ELEMENTS
005311 P 1
FUEL REPROCESSING
005311 P 1 075918 P 7 089425 P 9
GLOVE BOX
015084 P 3 026087 P 4 028560 P 5 040036 P 5
GUIDE
082792 P 9
HAZARD, RELATIVE
061931 P 6 082793 P 9
HEALTH PHYSICS TRAINING
003269 P 1 082793 P 9
HEAVY WATER
016308 P 3 033310 P 5 078445 P 8
HWCTR (TR)
011796 P 2
HYDRAULIC ANALYSIS
079235 P 8
IMPACT SHOCK
075763 P 6
INCIDENT
015081 P 3 015084 P 3 017118 P 3
INCIDENT, EQUIPMENT
015083 P 3
INCIDENT, NONREACTOR
009025 P 1 010561 P 2
INHALATION
011796 P 2 015081 P 3 015083 P 3 016308 P 3
026087 P 4
INSULATION
075763 P 6
ION EXCHANGE
078272 P 7
IRRADIATION FACILITY
078272 P 7
JACOBS
089425 P 9 094798 P 9
KRYPTON
075918 P 7
LEAK
077462 P 7 078445 P 8
LEAK RATE
024354 P 4 077462 P 7
LEGISLATION
064725 P 6
LRL
082792 P 9
MAINTENANCE AND REPAIR
011796 P 2
MAN
024740 P 4 064725 P 6
MATERIAL
033310 P 5
MEASUREMENT
033310 P 5
MILITARY CONSIDERATION
075963 P 7
MONITOR
075963 P 7 082225 P 8
MONITOR, AIR
024740 P 4
MONITOR, AREA
061931 P 6

MONITOR, GENERAL PRACTICE
004276 P 1
MONITOR, PERSONNEL
065205 P 6
MONITORING SYSTEM, RADIATION
065205 P 6 094798 P 9
MPBB
016308 P 3
MPC
015083 P 3
NEUTRON
078272 P 7 079235 P 8
NEVADA TEST SITE
061931 P 6
OCEAN AND SEA
089425 P 9
OFF SITE
044916 P 5
OPERATING EXPERIENCE
044916 P 5 094798 P 9
OPERATING EXPERIENCE SUMMARY
004276 P 1
OXIDE
064725 P 6
PATENT
082135 P 8
PERMSELECTIVE MEMBRANE
077462 P 7
PERSONNEL EXPOSURE, RADIATION
009022 P 1 009025 P 1 009302 P 1 010561 P 2
014080 P 2 015081 P 3 015083 P 3 015084 P 3
016308 P 3 026087 P 4 033310 P 5 042995 P 5
061931 P 6 064725 P 6 065205 P 6
PERSONNEL PROTECTIVE CLOTHING
082135 P 8
PERSONNEL PROTECTIVE DEVICE
003269 P 1 005311 P 1 014427 P 2 018170 P 3
033310 P 5 082135 P 8
PHYSIOLOGY/METABOLISM
064725 P 6
PLASTICS
033310 P 5
POWER PLANT, NUCLEAR
075918 P 7
PROCEDURES AND MANUALS
028560 P 5 082792 P 9
PUMPS
078272 P 7
RADIATION MONITORS
024740 P 4 042995 P 5
RADIATION SAFETY AND CONTROL
003269 P 1 011796 P 2 017118 P 3 018170 P 3
028560 P 5 042995 P 5 061931 P 6 065205 P 6
075963 P 7 082225 P 8 082792 P 9 082793 P 9
RADIOACTIVITY RELEASE
075918 P 7
RADIOBIOLOGY
021995 P 4
RADIOCHEMICAL PLANT SAFETY
016308 P 3
RADIOCHEMICAL PROCESSING
016308 P 3
RADIOISOTOPE
005311 P 1 016308 P 3 026087 P 4 033310 P 5
RADIOLOGICAL ASSISTANCE
016308 P 3 082793 P 9
RADIONUCLIDE UPTAKE
064725 P 6
REACTOR, HTGR
089425 P 9
REACTOR, HWR
003269 P 1 011796 P 2 021995 P 4
REACTOR, LMFBR
089425 P 9
REACTOR, LWR
089425 P 9
REACTOR, MOLTEN SALT
089425 P 9
REACTOR, PWR
011796 P 2
REACTOR, RESEARCH
004276 P 1
REACTOR, THERMONUCLEAR
077462 P 7 079235 P 8
REGULATION
082792 P 9
REGULATION, FEDERAL
075763 P 6
SAFETY EVALUATION
033310 P 5
SAFETY PRINCIPLES AND PHILOSOPHY
065205 P 6
SAFETY PROGRAM
065205 P 6
SAFETY REVIEW
075872 P 7
SAMPLING
061931 P 6
SAVANNAH RIVER PLANT
016308 P 3
SHIPPING CONTAINER
075763 P 6 075872 P 7 078445 P 8
STACK
044916 P 5
SURFACE WATER
089425 P 9
SYSTEM DESCRIPTION
075763 P 6 078272 P 7
TEST, BENCH
005311 P 1
TESTING
040036 P 5 061931 P 6 075763 P 6
THERMAL ANALYSIS
079235 P 8
THERMAL MECHANICAL EFFECT
079235 P 8
TRACER, RADIOACTIVE
040036 P 5
TRANSPORTATION AND HANDLING
024354 P 4 061931 P 6 075963 P 7
UNITED KINGDOM
004276 P 1
VENTILATION SYSTEM
015081 P 3 015084 P 3 026087 P 4 044916 P 5
082135 P 8
WASTE DISPOSAL
009022 P 1 061931 P 6 082225 P 8 089425 P 9
WASTE DISPOSAL, GAS
044916 P 5 094798 P 9
WASTE HANDLING
094798 P 9
WASTE MANAGEMENT
089425 P 9
WASTE STORAGE
061931 P 6 094798 P 9

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

ABERLE JA
028560 P 5
ALGER DL
078272 P 7
BILLARD F
040036 P 5
BUSH WR
021995 P 4 064725 P 6
BUTLER HM
061931 P 6
CAIRE R
014427 P 2
CARLSON GA
079235 P 8
CHARAMATHIEU A
040036 P 5
CHEW MH
082793 P 9
COFFIN DO
024354 P 4
COWAN FP
065205 P 6
FRANZEN LF
075918 P 7
GRAY PL
011796 P 2
HANNAHS RJ
075963 P 7
HAYWOOD FF
061931 P 6
JACKSON RF
004276 P 1
KARP W
009022 P 1
KATOH J
033310 P 5
KERSHNER CJ
075963 P 7
KILLIAN CR
009302 P 1
LAMBERGER PH
094798 P 9
LEE JD, FT. AL
079235 P 8
MACDONALD AR
028560 P 5
MORECRAFT WT
003269 P 1
MOREL P
040036 P 5
MUSGRAVE BC
089425 P 9
NICHOLS DC
016308 P 3
OHUCHI M
033310 P 5
OSBORNE RV
024740 P 4
PORTER SW
028560 P 5
PUECHL KH
009025 P 1
RHINEHAMMER TB
094798 P 9
ROGERS RF
075872 P 7
SAVORNIN J
082135 P 8
SCAGGS RA
075763 P 6 075872 P 7 078445 P 8
SILVER WJ
082793 P 9
STEINBERG R
078272 P 7
SUTER F
018170 P 3
SUTRA-FOURCADE Y
014427 P 2 042995 P 5
SYMONDS AF
005311 P 1
UNRUH CM
082792 P 9
VAUGH HA
010561 P 2
WATSON JS
077462 P 7
WERNER RW
079235 P 8

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN THE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE. * INDICATES END OF TITLE.)

#POLICY AND PRACTICE FOR	ACCELERATOR RADIATION SAFETY*	065205 P	6
PERSONNEL HAZARDS WHILE CHANGING TRITIUM TARGETS IN	ACCELERATORS* #A PROCEDURE FOR MINIMIZING	028560 P	5
#PVC SUITS FOR PERSONAL PROTECTION	AGAINST RADIOACTIVE CONTAMINATION*	018170 P	3
#MEANS OF DETECTING AND PROTECTING	AGAINST TRITIUM*	042995 P	5
REDUCTION OF TRITIUM CONCENTRATION RELEASED TO UNRESTRICTED	AREAS* #	044916 P	5
LABORATORY, LIVERMORE* #HEALTH PHYSICS	ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION	082793 P	9
#TRITIUM HAZARDS	ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR*	003269 P	1
(DEC. 1968-JAN. 1972)* #	BIBLIOGRAPHY ON HANDLING CONTROL AND MONITORING OF TRITIUM	075963 P	7
#MONITORING, CONTROL, AND DISPOSAL OF TRITIUM, A SELECTED	BIBLIOGRAPHY*	082225 P	8
#STUDY OF THE PERMEABILITY OF	CERTAIN MATERIALS TO TRITIUM*	014427 P	2
#REVIEW OF	CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)*	064725 P	6
#REVIEW OF	CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER*	021995 P	4
#A PROCEDURE FOR MINIMIZING PERSONNEL HAZARDS WHILE	CHANGING TRITIUM TARGETS IN ACCELERATORS*	028560 P	5
#INTERNAL EXPOSURE OF	CHEMIST TO TRITIUM*	026087 P	4
#JOHNS HOPKINS UNIVERSITY	CITED FOR NON COMPLIANCE*	017118 P	3
POLYMERIC FILMS, AND SAFETY EVALUATION OF PROTECTIVE	CLOTHING AND GLOVES MADE OF POLYMERIC FILMS* WATER THROUGH	033310 P	5
#JOHNS HOPKINS UNIVERSITY CITED FOR NON	COMPLIANCE*	017118 P	3
#IN-SITU REPAIRS IN THE HEAVY WATER	COMPONENTS TEST REACTOR*	011796 P	2
#REDUCTION OF TRITIUM	CONCENTRATION RELEASED TO UNRESTRICTED AREAS*	044916 P	5
REPORT - TRITIATED HEAVY WATER SHIPMENTS UNDER SPECIAL	CONDITIONS (PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS)	078445 P	8
REACTOR* #PROGRESS REPORT NO. 1 ON THE DESIGN	CONSIDERATIONS FOR A LOW POWER EXPERIMENTAL MIRROR FUSION	079235 P	8
#PERMEABILITY OF FABRICS IN	CONTACT WITH TRITIUM AND TRITIATED WATER*	040036 P	5
#SAFETY SUMMARY REPORT - LP-12 TRITIUM	CONTAINER (PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS)*	075763 P	6
MATERIALS, FINAL #SAFETY SUMMARY REPORT - LP-50 TRITIUM	CONTAINER - PACKAGING OF RADIOACTIVE AND FISSILE	075872 P	7
#PROTECTIVE EQUIPMENT FOR PERSONNEL WORKING IN	CONTAMINATED ENVIRONMENTS*	082135 P	8
#TRITIUM	CONTAMINATION AT THEODORE R. SCHWALM, INC.*	010200 P	2
#SOME (SECOND) THOUGHTS ON TRITIUM	CONTAMINATION*	024354 P	4
#PVC SUITS FOR PERSONAL PROTECTION AGAINST RADIOACTIVE	CONTAMINATION*	018170 P	3
#BIBLIOGRAPHY ON HANDLING	CONTROL AND MONITORING OF TRITIUM (DEC. 1968-JAN. 1972)*	075963 P	7
#HEALTH PHYSICS ASPECTS OF TRITIUM	CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE*	082793 P	9
DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR	CONTROL STRATEGIES* #TRITIUM	089425 P	9
#TRITIUM	CONTROL TECHNOLOGY*	094798 P	9
#MONITORING,	CONTROL, AND DISPOSAL OF TRITIUM, A SELECTED BIBLIOGRAPHY*	082225 P	8
#TRITIUM EXPOSURE AT U.S. RADIUM	CORP. JAN. 11, 1967*	015084 P	3
#TRITIUM EXPOSURE AT US RADIUM	CORP., DEC. 13, 1966*	015083 P	3
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR	CORPORATION*	014080 P	2
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR	CORPORATION, FEBRUARY 16, 1966*	009302 P	1
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR	CORPORATION, FEBRUARY 24, 1966*	009025 P	1
#TRITIUM EXPOSURE AT U. S. RADIUM	CORPORATION, JUNE 2, 1966*	010561 P	2
#STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT	CRNL*	024740 P	4
#TRITIUM EXPOSURE AT US RADIUM CORP.,	DEC. 13, 1966*	015083 P	3
BIBLIOGRAPHY ON HANDLING CONTROL AND MONITORING OF TRITIUM (	DEC. 1968-JAN. 1972)* #	075963 P	7
WITH VIEW TO ENVIRONMENT PROTECTION* #	DESIGN AND PRODUCT IMPROVEMENT FOR NUCLEAR POWER PLANTS	075918 P	7
FUSION REACTOR* #PROGRESS REPORT NO. 1 ON THE	DESIGN CONSIDERATIONS FOR A LOW POWER EXPERIMENTAL MIRROR	079235 P	8
#MEANS OF	DETECTING AND PROTECTING AGAINST TRITIUM*	042995 P	5
#MONITORING, CONTROL, AND	DISPOSAL OF TRITIUM, A SELECTED BIBLIOGRAPHY*	082225 P	8
FOR CONTROL STRATEGIES* #TRITIUM	DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS	089425 P	9
#TRITIUM EXPOSURE AT NEW	ENGLAND NUCLEAR CORPORATION*	014080 P	2
#TRITIUM EXPOSURE AT NEW	ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966*	009302 P	1
#TRITIUM EXPOSURE AT NEW	ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966*	009025 P	1
PRODUCT IMPROVEMENT FOR NUCLEAR POWER PLANTS WITH VIEW TO	ENVIRONMENT PROTECTION* #DESIGN AND	075918 P	7
#PROTECTIVE EQUIPMENT FOR PERSONNEL WORKING IN CONTAMINATED	ENVIRONMENTS*	082135 P	8
ENVIRONMENTS* #PROTECTIVE	EQUIPMENT FOR PERSONNEL WORKING IN CONTAMINATED	082135 P	8
#	EVALUATION OF PLASTIC FILMS FOR PROTECTIVE SUITING*	005311 P	1
TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY	EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE OF	033310 P	5
RESEARCH REACTORS* #	EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX	004276 P	1
#REVIEW OF CHALK RIVER	EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)*	064725 P	6
#REVIEW OF CHALK RIVER	EXPERIENCE WITH TRITIATED HEAVY WATER*	021995 P	4
REPORT NO. 1 ON THE DESIGN CONSIDERATIONS FOR A LOW POWER	EXPERIMENTAL MIRROR FUSION REACTOR* #PROGRESS	079235 P	8
#TRITIUM	EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION*	014080 P	2
1966* #TRITIUM	EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16,	009302 P	1
1966* #TRITIUM	EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24,	009025 P	1

#TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966* 009022 P 1
#TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966* 010561 P 2
#TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967* 015084 P 3
#TRITIUM EXPOSURE AT US RADIUM CORP., DEC. 13, 1966* 015083 P 3
#INTERNAL EXPOSURE OF CHEMIST TO TRITIUM* 026087 P 4

#PERMEABILITY OF FABRICS IN CONTACT WITH TRITIUM AND TRITIATED WATER* 040036 P 5
#RADIOLOGICAL PROTECTION IN A TRITIUM SEPARATIONS FACILITY* 016308 P 3
#JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967* 015081 P 3
#EVALUATION OF PLASTIC FILMS FOR PROTECTIVE SUITING* 005311 P 1
OF PROTECTIVE CLOTHING AND GLOVES MADE OF POLYMERIC FILMS*WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION 033310 P 5
PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND 033310 P 5
CONTAINER - PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS. FINAL REPORT* #SAFETY SUMMARY REPORT - LP-50 TRITIUM 075872 P 7
- LP-50 TRITIUM CONTAINER - PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS. FINAL REPORT* #SAFETY SUMMARY REPORT 075872 P 7
- LP-12 TRITIUM CONTAINER (PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS)* #SAFETY SUMMARY REPORT 075763 P 6
UNDER SPECIAL CONDITIONS (PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS)* - TRITIATED HEAVY WATER SHIPMENTS 078445 P 8
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* 004276 P 1
DESIGN CONSIDERATIONS FOR A LOW POWER EXPERIMENTAL MIRROR FUSION REACTOR* #PROGRESS REPORT NO. 1 ON THE 079235 P 8
#A SUMMARY OF TRITIUM HANDLING PROBLEMS IN FUSION REACTORS* 077462 P 7

#A NEW PUMPING SYSTEM FOR A 150-KILOVOLT NEUTRON GENERATOR TO REDUCE THE PRESENT TRITIUM HAZARD* 078272 P 7
FILMS, AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE OF POLYMERIC FILMS* WATER THROUGH POLYMERIC 033310 P 5
#RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD PRACTICES* 082792 P 9

1972)* #BIBLIOGRAPHY ON HANDLING CONTROL AND MONITORING OF TRITIUM (DEC. 1968-JAN. 075963 P 7
#A SUMMARY OF TRITIUM HANDLING PROBLEMS IN FUSION REACTORS* 077462 P 7
KILOVOLT NEUTRON GENERATOR TO REDUCE THE PRESENT TRITIUM HAZARD* #A NEW PUMPING SYSTEM FOR A 150- 078272 P 7
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR* 003269 P 1
#A PROCEDURE FOR MINIMIZING PERSONNEL HAZARDS WHILE CHANGING TRITIUM TARGETS IN ACCELERATORS* 028560 P 5
RADIATION LABORATORY, LIVERMORE* # HEALTH PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE 082793 P 9
#STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT CRNL* 024740 P 4
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 6
#IN-SITU REPAIRS IN THE HEAVY WATER COMPONENTS TEST REACTOR* 011796 P 2
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR* 003269 P 1
OF RADIOACTIVE AND #SAFETY SUMMARY REPORT - TRITIATED HEAVY WATER SHIPMENTS UNDER SPECIAL CONDITIONS (PACKAGING 078445 P 8
OF #MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION 033310 P 5
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER* 021995 P 4
#RADIATION SAFETY PRACTICES - OPERATION HENRE* 061931 P 6
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* 004276 P 1
#JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 3
#JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967* 015081 P 3

ENVIRONMENT PROTECTION* #DESIGN AND PRODUCT IMPROVEMENT FOR NUCLEAR POWER PLANTS WITH VIEW TO 075918 P 7
IN-SITU REPAIRS IN THE HEAVY WATER COMPONENTS TEST REACTOR* 011796 P 2
#TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.* 010200 P 2
#TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES* 089425 P 9
INTERNAL EXPOSURE OF CHEMIST TO TRITIUM* 026087 P 4

#TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967* 015084 P 3
ON HANDLING CONTROL AND MONITORING OF TRITIUM (DEC. 1968- JAN. 1972)* #BIBLIOGRAPHY 075963 P 7
JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 3
JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967* 015081 P 3

HAZARD* #A NEW PUMPING SYSTEM FOR A 150- KILOVOLT NEUTRON GENERATOR TO REDUCE THE PRESENT TRITIUM 078272 P 7

ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE* #HEALTH PHYSICS 082793 P 9
#HEALTH PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE* 082793 P 9
OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE* #HEALTH PHYSICS ASPECTS 082793 P 9
#PROGRESS REPORT NO. 1 ON THE DESIGN CONSIDERATIONS FOR A LOW POWER EXPERIMENTAL MIRROR FUSION REACTOR* 079235 P 8
FISSILE MATERIALS)* #SAFETY SUMMARY REPORT - LP-12 TRITIUM CONTAINER (PACKAGING OF RADIOACTIVE AND 075763 P 6
FISSILE MATERIALS. FINAL REPORT* #SAFETY SUMMARY REPORT - LP-50 TRITIUM CONTAINER - PACKAGING OF RADIOACTIVE AND 075872 P 7

AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE OF POLYMERIC FILMS* WATER THROUGH POLYMERIC FILMS, 033310 P 5
#RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD PRACTICES* 082792 P 9

#STUDY OF THE PERMEABILITY OF CERTAIN	MATERIALS TO TRITIUM*	014427 P 2
50 TRITIUM CONTAINER - PACKAGING OF RADIOACTIVE AND FISSILE	MATERIALS. FINAL REPORT* #SAFETY SUMMARY REPORT - LP-	075872 P 7
12 TRITIUM CONTAINER (PACKAGING OF RADIOACTIVE AND FISSILE	MATERIALS)* #SAFETY SUMMARY REPORT - LP-	075763 P 6
SPECIAL CONDITIONS (PACKAGING OF RADIOACTIVE AND FISSILE	MATERIALS)* REPORT - TRITIATED HEAVY WATER SHIPMENTS UNDER	078445 P 8
#	MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM*	042995 P 5
WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF #	MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED HEAVY	033310 P 5
TARGETS IN ACCELERATORS* #A PROCEDURE FOR	MINIMIZING PERSONNEL HAZARDS WHILE CHANGING TRITIUM	028560 P 5
1 ON THE DESIGN CONSIDERATIONS FOR A LOW POWER EXPERIMENTAL	MIRROR FUSION REACTOR* #PROGRESS REPORT NO.	079235 P 8
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER	MODERATED REACTOR*	003269 P 1
#BIBLIOGRAPHY ON HANDLING CONTROL AND	MONITORING OF TRITIUM (DEC. 1968-JAN. 1972)*	075963 P 7
BIBLIOGRAPHY* #	MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED	082225 P 8
#A NEW PUMPING SYSTEM FOR A 150-KILOVOLT	NEUTRON GENERATOR TO REDUCE THE PRESENT TRITIUM HAZARD*	078272 P 7
#TRITIUM EXPOSURE AT	NEW ENGLAND NUCLEAR CORPORATION*	014080 P 2
#TRITIUM EXPOSURE AT	NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966*	009302 P 1
#TRITIUM EXPOSURE AT	NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966*	009025 P 1
REDUCE THE PRESENT TRITIUM HAZARD* #A	NEW PUMPING SYSTEM FOR A 150-KILOVOLT NEUTRON GENERATOR TO	078272 P 7
#JOHNS HOPKINS UNIVERSITY CITED FOR	NON COMPLIANCE*	017118 P 3
#TRITIUM EXPOSURE AT NEW ENGLAND	NUCLEAR CORPORATION*	014080 P 2
#TRITIUM EXPOSURE AT NEW ENGLAND	NUCLEAR CORPORATION, FEBRUARY 16, 1966*	009302 P 1
#TRITIUM EXPOSURE AT NEW ENGLAND	NUCLEAR CORPORATION, FEBRUARY 24, 1966*	009025 P 1
#TRITIUM DISTRIBUTION IN THE	NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES*	089425 P 9
#DESIGN AND PRODUCT IMPROVEMENT FOR	NUCLEAR POWER PLANTS WITH VIEW TO ENVIRONMENT PROTECTION*	075918 P 7
#EXPERIENCE OF	OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS*	004276 P 1
#RADIATION SAFETY PRACTICES -	OPERATION HENRE*	061931 P 6
REPORT* #SAFETY SUMMARY REPORT - LP-50 TRITIUM CONTAINER -	PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS. FINAL	075872 P 7
#SAFETY SUMMARY REPORT - LP-12 TRITIUM CONTAINER (	PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS)*	075763 P 6
- TRITIATED HEAVY WATER SHIPMENTS UNDER SPECIAL CONDITIONS (	PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS)* REPORT	078445 P 8
#STUDY OF THE	PERMEABILITY OF CERTAIN MATERIALS TO TRITIUM*	014427 P 2
TRITIATED WATER* #	PERMEABILITY OF FABRICS IN CONTACT WITH TRITIUM AND	040036 P 5
FILMS, AND SAFETY EVALUATION OF #MEASUREMENTS OF THE	PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC	033310 P 5
#PVC SUITS FOR	PERSONAL PROTECTION AGAINST RADIOACTIVE CONTAMINATION*	018170 P 3
ACCELERATORS* #A PROCEDURE FOR MINIMIZING	PERSONNEL HAZARDS WHILE CHANGING TRITIUM TARGETS IN	028560 P 5
#PROTECTIVE EQUIPMENT FOR	PERSONNEL WORKING IN CONTAMINATED ENVIRONMENTS*	082135 P 8
RADIATION LABORATORY, LIVERMORE* #HEALTH	PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE	082793 P 9
#STUDIES AND TECHNIQUES IN TRITIUM HEALTH	PHYSICS AT CRNL*	024740 P 4
#DESIGN AND PRODUCT IMPROVEMENT FOR NUCLEAR POWER	PLANTS WITH VIEW TO ENVIRONMENT PROTECTION*	075918 P 7
#EVALUATION OF	PLASTIC FILMS FOR PROTECTIVE SUITING*	005311 P 1
#	POLICY AND PRACTICE FOR ACCELERATOR RADIATION SAFETY*	065205 P 6
SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE OF	POLYMERIC FILMS* HEAVY WATER THROUGH POLYMERIC FILMS, AND	033310 P 5
OF THE PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH	POLYMERIC FILMS, AND SAFETY EVALUATION OF PROTECTIVE	033310 P 5
REPORT NO. 1 ON THE DESIGN CONSIDERATIONS FOR A LOW	POWER EXPERIMENTAL MIRROR FUSION REACTOR* #PROGRESS	079235 P 8
#DESIGN AND PRODUCT IMPROVEMENT FOR NUCLEAR	POWER PLANTS WITH VIEW TO ENVIRONMENT PROTECTION*	075918 P 7
#POLICY AND	PRACTICE FOR ACCELERATOR RADIATION SAFETY*	065205 P 6
#RADIATION SAFETY	PRACTICES - OPERATION HENRE*	061931 P 6
#RADIATION PROTECTION	PRACTICES FOR TRITIUM. A MANUAL OF GOOD PRACTICES*	082792 P 9
PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD	PRACTICES* #RADIATION	082792 P 9
SYSTEM FOR A 150-KILOVOLT NEUTRON GENERATOR TO REDUCE THE	PRESENT TRITIUM HAZARD* #A NEW PUMPING	078272 P 7
#A SUMMARY OF TRITIUM HANDLING	PROBLEMS IN FUSION REACTORS*	077462 P 7
TRITIUM TARGETS IN ACCELERATORS* #A	PROCEDURE FOR MINIMIZING PERSONNEL HAZARDS WHILE CHANGING	028560 P 5
#DESIGN AND	PRODUCT IMPROVEMENT FOR NUCLEAR POWER PLANTS WITH VIEW TO	075918 P 7
ENVIRONMENT PROTECTION*		
#MEANS OF DETECTING AND	PROTECTING AGAINST TRITIUM*	042995 P 5
#PVC SUITS FOR PERSONAL	PROTECTION AGAINST RADIOACTIVE CONTAMINATION*	018170 P 3
#RADIOLOGICAL	PROTECTION IN A TRITIUM SEPARATIONS FACILITY*	016308 P 3
#RADIATION	PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD	082792 P 9
PRACTICES*		
FOR NUCLEAR POWER PLANTS WITH VIEW TO ENVIRONMENT	PROTECTION* #DESIGN AND PRODUCT IMPROVEMENT	075918 P 7
WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF	PROTECTIVE CLOTHING AND GLOVES MADE OF POLYMERIC FILMS*	033310 P 5
#	PROTECTIVE EQUIPMENT FOR PERSONNEL WORKING IN CONTAMINATED	082135 P 8
ENVIRONMENTS*		
#EVALUATION OF PLASTIC FILMS FOR	PROTECTIVE SUITING*	005311 P 1
REDUCE THE PRESENT TRITIUM HAZARD* #A NEW	PUMPING SYSTEM FOR A 150-KILOVOLT NEUTRON GENERATOR TO	078272 P 7
#	PVC SUITS FOR PERSONAL PROTECTION AGAINST RADIOACTIVE	018170 P 3
CONTAMINATION*		
#TRITIUM CONTAMINATION AT THEODORE	R. SCHWALM, INC.*	010200 P 2
#HEALTH PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE	RADIATION LABORATORY, LIVERMORE*	082793 P 9
#	RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF	082792 P 9
GOOD PRACTICES*		
#	RADIATION SAFETY PRACTICES - OPERATION HENRE*	061931 P 6
#POLICY AND PRACTICE FOR ACCELERATOR	RADIATION SAFETY*	065205 P 6
SUMMARY REPORT - LP-50 TRITIUM CONTAINER - PACKAGING OF	RADIOACTIVE AND FISSILE MATERIALS. FINAL REPORT* #SAFETY	075872 P 7
SUMMARY REPORT - LP-12 TRITIUM CONTAINER (PACKAGING OF	RADIOACTIVE AND FISSILE MATERIALS)* #SAFETY	075763 P 6
WATER SHIPMENTS UNDER SPECIAL CONDITIONS (PACKAGING OF	RADIOACTIVE AND FISSILE MATERIALS)* - TRITIATED HEAVY	078445 P 8
#PVC SUITS FOR PERSONAL PROTECTION AGAINST	RADIOACTIVE CONTAMINATION*	018170 P 3
#	RADIOLOGICAL PROTECTION IN A TRITIUM SEPARATIONS FACILITY*	016308 P 3
#TRITIUM EXPOSURE AT U.S.	RADIUM CORP. JAN. 11, 1967*	015084 P 3
#TRITIUM EXPOSURE AT US	RADIUM CORP., DEC. 13, 1966*	015083 P 3

#TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966* 010561 P 2
SAFETY EVALUATION OF #MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND 033310 P 5
#IN-SITU REPAIRS IN THE HEAVY WATER COMPONENTS TEST REACTOR* 011796 P 2
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR* 003269 P 1
CONSIDERATIONS FOR A LOW POWER EXPERIMENTAL MIRROR FUSION REACTOR* #PROGRESS REPORT NO. 1 ON THE DESIGN 079235 P 8
#A SUMMARY OF TRITIUM HANDLING PROBLEMS IN FUSION REACTORS* 077462 P 7
OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* #EXPERIENCE 004276 P 1
NEW PUMPING SYSTEM FOR A 150-KILOVOLT NEUTRON GENERATOR TO REDUCE THE PRESENT TRITIUM HAZARD* #A 078272 P 7
UNRESTRICTED AREAS* # REDUCTION OF TRITIUM CONCENTRATION RELEASED TO 044916 P 5
#JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967* 015081 P 3
#REDUCTION OF TRITIUM CONCENTRATION RELEASED TO UNRESTRICTED AREAS* 044916 P 5
#IN-SITU REPAIRS IN THE HEAVY WATER COMPONENTS TEST REACTOR* 011796 P 2
#TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES* 089425 P 9
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* 004276 P 1
WATER (T6865)* # REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY 064725 P 6
* # REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER 021995 P 4
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 6
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER* 021995 P 4

#TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966* 010561 P 2
RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF PROTECTIVE CLOTHING AND GLOVES MADE 033310 P 5
#RADIATION SAFETY PRACTICES - OPERATION HENRE* 061931 P 6
OF RADIOACTIVE AND FISSILE MATERIALS)* # SAFETY SUMMARY REPORT - LP-12 TRITIUM CONTAINER (PACKAGING 075763 P 6
PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS, FINAL # SAFETY SUMMARY REPORT - LP-50 TRITIUM CONTAINER - 075872 P 7
UNDER SPECIAL CONDITIONS (PACKAGING OF RADIOACTIVE AND # SAFETY SUMMARY REPORT - TRITIATED HEAVY WATER SHIPMENTS 078445 P 8
#POLICY AND PRACTICE FOR ACCELERATOR RADIATION SAFETY* 065205 P 6
#TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.* 010200 P 2
#MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A (SECOND) THOUGHTS ON TRITIUM CONTAMINATION* 024354 P 4
#RADIOLOGICAL PROTECTION IN A TRITIUM SELECTED BIBLIOGRAPHY* 082225 P 8
RADIOACTIVE #SAFETY SUMMARY REPORT - TRITIATED HEAVY WATER SEPARATIONS FACILITY* 016308 P 3
#IN- SHIPMENTS UNDER SPECIAL CONDITIONS (PACKAGING OF 078445 P 8
SUMMARY REPORT - TRITIATED HEAVY WATER SHIPMENTS UNDER # SITU REPAIRS IN THE HEAVY WATER COMPONENTS TEST REACTOR* 011796 P 2
IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL # SOME (SECOND) THOUGHTS ON TRITIUM CONTAMINATION* 024354 P 4
SPECIAL CONDITIONS (PACKAGING OF RADIOACTIVE AND FISSILE 078445 P 8
STRATEGIES* #TRITIUM DISTRIBUTION 089425 P 9
STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT CRNL* 024740 P 4
#EVALUATION OF PLASTIC FILMS FOR PROTECTIVE # STUDY OF THE PERMEABILITY OF CERTAIN MATERIALS TO TRITIUM* 014427 P 2
CONTAMINATION* SUITING* 005311 P 1
#PVC SUITS FOR PERSONAL PROTECTION AGAINST RADIOACTIVE 018170 P 3
#A SUMMARY OF TRITIUM HANDLING PROBLEMS IN FUSION REACTORS* 077462 P 7
RADIOACTIVE AND FISSILE MATERIALS)* #SAFETY SUMMARY REPORT - LP-12 TRITIUM CONTAINER (PACKAGING OF 075763 P 6
RADIOACTIVE AND FISSILE MATERIALS, FINAL REPORT* #SAFETY SUMMARY REPORT - LP-50 TRITIUM CONTAINER - PACKAGING OF 075872 P 7
SPECIAL CONDITIONS (PACKAGING OF RADIOACTIVE AND #SAFETY SUMMARY REPORT - TRITIATED HEAVY WATER SHIPMENTS UNDER 078445 P 8
PRESENT TRITIUM HAZARD* #A NEW PUMPING SYSTEM FOR A 150-KILOVOLT NEUTRON GENERATOR TO REDUCE THE 078272 P 7

FOR MINIMIZING PERSONNEL HAZARDS WHILE CHANGING TRITIUM TARGETS IN ACCELERATORS* #A PROCEDURE 028560 P 5
#STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT CRNL* 024740 P 4
#TRITIUM CONTROL TECHNOLOGY* 094798 P 9
#IN-SITU REPAIRS IN THE HEAVY WATER COMPONENTS TEST REACTOR* 011796 P 2
#TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.* 010200 P 2
#SOME (SECOND) THOUGHTS ON TRITIUM CONTAMINATION* 024354 P 4
OF THE PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF 033310 P 5
#TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966* 009022 P 1
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 6
PACKAGING OF RADIOACTIVE AND #SAFETY SUMMARY REPORT - TRITIATED HEAVY WATER SHIPMENTS UNDER SPECIAL CONDITIONS (078445 P 8
EVALUATION OF #MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY 033310 P 5
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER* 021995 P 4
#PERMEABILITY OF FABRICS IN CONTACT WITH TRITIUM AND TRITIATED WATER* 040036 P 5
#BIBLIOGRAPHY ON HANDLING CONTROL AND MONITORING OF TRITIUM (DEC. 1968-JAN. 1972)* 075963 P 7
#PERMEABILITY OF FABRICS IN CONTACT WITH TRITIUM AND TRITIATED WATER* 040036 P 5
#REDUCTION OF TRITIUM CONCENTRATION RELEASED TO UNRESTRICTED AREAS* 044916 P 5
MATERIALS)* #SAFETY SUMMARY REPORT - LP-12 TRITIUM CONTAINER (PACKAGING OF RADIOACTIVE AND FISSILE 075763 P 6
MATERIALS, FINAL REPORT* #SAFETY SUMMARY REPORT - LP-50 TRITIUM CONTAINER - PACKAGING OF RADIOACTIVE AND FISSILE 075872 P 7
TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.* 010200 P 2
#SOME (SECOND) THOUGHTS ON TRITIUM CONTAMINATION* 024354 P 4
LIVERMORE* #HEALTH PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, 082793 P 9
TRITIUM CONTROL TECHNOLOGY* 094798 P 9
REQUIREMENTS FOR CONTROL STRATEGIES* # TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE 089425 P 9
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION* 014080 P 2
FEBRUARY 24, 1966* # TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, 009025 P 1
FEBRUARY 16, 1966* # TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, 009302 P 1
TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966* 009022 P 1
TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966* 010561 P 2
TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967* 015084 P 3
TRITIUM EXPOSURE AT US RADIUM CORP., DEC. 13, 1966* 015083 P 3
#A SUMMARY OF TRITIUM HANDLING PROBLEMS IN FUSION REACTORS* 077462 P 7
FOR A 150-KILOVOLT NEUTRON GENERATOR TO REDUCE THE PRESENT TRITIUM HAZARD* #A NEW PUMPING SYSTEM 078272 P 7
REACTOR* # TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED 003269 P 1
#STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT CRNL* 024740 P 4
#JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967* 015081 P 3
#RADIOLOGICAL PROTECTION IN A TRITIUM SEPARATIONS FACILITY* 016308 P 3
A PROCEDURE FOR MINIMIZING PERSONNEL HAZARDS WHILE CHANGING TRITIUM TARGETS IN ACCELERATORS* # 028560 P 5

#INTERNAL EXPOSURE OF CHEMIST TO TRITIUM* 026087 P 4
#STUDY OF THE PERMEABILITY OF CERTAIN MATERIALS TO TRITIUM* 014427 P 2
#MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM* 042995 P 5
#RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD PRACTICES* 082792 P 9
#MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY* 082275 P 8
OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* #REVIEW 064725 P 6

#TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 7, 1966* 010561 P 2
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* 004276 P 1
#TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967* 015084 P 3
#SAFETY SUMMARY REPORT - TRITIATED HEAVY WATER SHIPMENTS UNDER SPECIAL CONDITIONS (PACKAGING OF RADIOACTIVE AND 078445 P 8
#JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 3
#JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967* 015081 P 3
#REDUCTION OF TRITIUM CONCENTRATION RELEASED TO UNRESTRICTED AREAS* 044916 P 5
#TRITIUM EXPOSURE AT US RADIUM CORP., DEC. 13, 1966* 015083 P 3
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* 004276 P 1

AND PRODUCT IMPROVEMENT FOR NUCLEAR POWER PLANTS WITH VIEW TO ENVIRONMENT PROTECTION* #DESIGN 075918 P 7

#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 6
#IN-SITU REPAIRS IN THE HEAVY WATER COMPONENTS TEST REACTOR* 011796 P 2
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR* 003269 P 1
RADIOACTIVE AND #SAFETY SUMMARY REPORT - TRITIATED HEAVY WATER SHIPMENTS UNDER SPECIAL CONDITIONS (PACKAGING OF 078445 P 8
#MEASUREMENTS OF THE PERMEATION RATE OF TRITIATED HEAVY WATER THROUGH POLYMERIC FILMS, AND SAFETY EVALUATION OF 033310 P 5
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER* 021995 P 4
OF FABRICS IN CONTACT WITH TRITIUM AND TRITIATED WATER* #PERMEABILITY 040036 P 5
#A PROCEDURE FOR MINIMIZING PERSONNEL HAZARDS WHILE CHANGING TRITIUM TARGETS IN ACCELERATORS* 028560 P 5
#PROTECTIVE EQUIPMENT FOR PERSONNEL WORKING IN CONTAMINATED ENVIRONMENTS* 082135 P 8

IV Measurement and Monitoring Techniques

IV - MEASUREMENT AND MONITORING TECHNIQUES

004811
FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, ROBERT A. TAFT SANITARY ENGINEERING CENTER
33 PAGES, 23 FIGURES, 7 TABLES- 1960, SEC-TR R60-2 (A/AC.82/G/L 511) (TID-12884)- OTS

THIS REPORT ON WATER-BORNE RADIONUCLIDES RECORDS PROGRESS MADE IN FIVE SPECIFIC AREAS OF STUDY DURING THE SECOND YEAR OF THE PROJECT, COVERING THE PERIOD FROM MAY 1, 1958 TO JUNE 30, 1959. THE AREAS COVERED INCLUDE INSTRUMENTATION, TRITIUM, ESTUARINE AND MARINE WATERS, AQUATIC BIOTA, AND THE FATE OF RADIOACTIVE MATERIALS IN THE WATER ENVIRONMENT. DESCRIBED ARE SOME CHANGES MADE IN EXISTING COUNTING EQUIPMENT TO IMPROVE SENSITIVITY, PROGRESS MADE TO IMPROVE TRITIUM ANALYSES, IMPROVEMENTS IN ANALYSES OF RADIONUCLIDES IN SEA WATER, METHODS USED TO IDENTIFY RADIONUCLIDES ASSOCIATED WITH ALGAE, AND THE DEVELOPMENT OF STREAM SAMPLING DEVICES. RESULTS OF ANALYSES OF SAMPLES COLLECTED AT KAPL, SAVANNAH RIVER, AND SHIPPINGPORT ARE REPORTED.

CRUSTACEAN + CESIUM + ECOLOGY + *MONITOR, LIQUID + STRONTIUM + *SURVEY, ENVIRONMENT + *SURFACE WATER, NUCLIDE OCCURRENCE + *SURFACE WATER, SUSPENDED MATERIAL + RADIATION MONITORS

005383
PRINCE JR + WANG CH
A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA EMITTERS
OREGON STATE UNIVERSITY
17 PAGES- 1964, TID-21400- OTS

THE METHOD OF LIQUID SCINTILLATION COUNTING IN USE AT OREGON STATE UNIVERSITY FOR DETECTING AND EVALUATING SURFACE CONTAMINATION CONSISTING OF SOFT BETAS, ESPECIALLY TRITIUM, IS DESCRIBED. A SURFACE SUSPECTED OF BEING CONTAMINATED IS SWIPED WITH AN APPROPRIATE FILTER PAPER. A SECTION OF THE PAPER IS CUT OUT, MOISTENED WITH CONVENTIONAL PHOSPHOR SOLUTION, AND PLACED DIRECTLY INTO A STANDARD VIAL FOR COUNTING IN A LIQUID SCINTILLATION COUNTER. THE COUNTING EFFICIENCY FOR THIS METHOD HAS BEEN DETERMINED TO BE GREATER THAN 5% FOR TRITIUM IN THE ABSENCE OF SEVERE QUENCHING AND GREATER THAN 50% FOR CARBON-14. THIS SUGGESTS THAT THE METHOD IS ADEQUATE FOR THE DETECTION OF MILLIMICROCURIE QUANTITIES OF REMOVABLE SURFACE CONTAMINATION AND APPEARS TO BE ONE OF THE MOST CONVENIENT AND SENSITIVE TECHNIQUES FOR MONITORING TRITIUM.

*ANALYTICAL TECHNIQUE + GROSS BETA + *MONITOR, SURFACE + SOLID + RADIATION MONITORS

005771
PROCEDURES FOR DETERMINATION OF STABLE ELEMENTS AND RADIONUCLIDES IN ENVIRONMENTAL SAMPLES
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
66 PAGES, FIGURES, TABLES, REFERENCES, JANUARY 1965, PHS-PBL 999-RH-10- GPO

THIS IS A MANUAL OF METHODS USED AT THE PUBLIC HEALTH SERVICES SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY FOR THE DETERMINATION OF STABLE ELEMENTS AND RADIONUCLIDES IN ENVIRONMENTAL SAMPLES. THE PROCEDURES ARE INTENDED FOR USE IN THE PROCESSING OF RELATIVELY LARGE NUMBERS OF SAMPLES IN A MINIMUM OF TIME FOR ENVIRONMENTAL RADIOLOGICAL SURVEILLANCE. THE MANUAL IS DIVIDED INTO SECTIONS ON MILK, FOOD, BIOTA, SILT, SOIL, WATER, AND COUNTING PROCEDURES. APPENDIXES COVER PREPARATION OF REAGENTS AND TABLES OF SELECTED RADIONUCLIDE DECAY AND INGROWTH FACTORS.

BARIUM + CALCIUM + STRONTIUM + BIOTA + POTASSIUM + *ANALYTICAL TECHNIQUE + MILK + MONITOR, ENVIRONMENTAL + GROSS ALPHA + GROSS BETA + INSTRUMENT CALIBRATION + PHOSPHATE + LIQUID + SOLID + FOOD + RADIATION MONITORS

006680
MERRILL RT
AN ANALYZER FOR RADIOACTIVE GAS
THE DOW CHEMICAL COMPANY, GOLDEN, COLORADO
10 PAGES, 5 FIGURES, 4 REFERENCES- MAY 11, 1965, RFP-500- CFSTI

THE OPERATION AT ROCKY FLATS SOMETIMES RESULTS IN THE STORAGE OF TRITIUM CONTAINERS IN A PARTICULAR WORK AREA. SINCE PEOPLE INHABIT THIS AREA DAILY, IT WAS CONSIDERED NECESSARY BY THE HEALTH PHYSICS STAFF THAT AN AUTOMATIC AND CONTINUAL AIR MONITORING INSTRUMENT BE MADE AVAILABLE. THE INSTRUMENT WAS TO PROVIDE AUDIBLE AND VISUAL ALARMS IN THE EVENT A CONTAINER SHOULD ACCIDENTALLY LEAK. AN INSTRUMENT THAT CAN CONTINUOUSLY MONITOR AIR FOR TRITIUM HAS BEEN DEVELOPED. IT UTILIZES A FLOW TYPE IONIZATION CHAMBER AND A VIBRATING REED ELECTROMETER. A RESPONSE OF DOUBLE NORMAL BACKGROUND IS PRODUCED BY 9.4 X 10 MINUS 5 MUC H^3/CC AIR- THE PRESENTLY ACCEPTED MPC IS 2.0 X 10 MINUS 5 MUC H^3/CC AIR. ITS OPERATION IS COMPLETELY AUTOMATIC. THE ANALYZER IS NOW IN ROUTINE USE.

*PERSONNEL PROTECTIVE DEVICE + *RADIATION MONITORS

006958
VERHAGEN BT + SELLSCHOP JP
ENRICHMENT AND ASSAY OF NATURALLY OCCURRING TRITIUM
UNIVERSITY OF WITWATERSRAND, JOHANNESBURG
11 PAGES, 5 FIGURES, 2 TABLES, REFERENCES- 1963, PROCEEDINGS OF THE NATIONAL CONFERENCE ON NUCLEAR ENERGY HELD IN PRETORIA, SOUTH AFRICA APRIL 5-8- PAGE 109-119 OF NATIONAL CONFERENCE ON NUCLEAR ENERGY- APPLICATION OF ISOTOPES AND RADIATION

THE MAJOR PROBLEMS ASSOCIATED WITH THE MEASUREMENT OF NATURALLY OCCURRING TRITIUM ARE CONSIDERED. THE POTENCY OF ASSAY BY A COMBINATION OF THERMAL DIFFUSION ENRICHMENT AND GAS COUNTING IS ARGUED.

006958 *CONTINUED*
PARAMETERS OF AND EXPERIMENTS ON A TWO-STAGE THERMAL DIFFUSION SYSTEM ARE DESCRIBED AND RESULTS PRESENTED.

*TRACER, RADIOACTIVE + *SURFACE WATER, TRACER + ANALYTICAL TECHNIQUE + GROUND WATER, TRACER + TRACER + *RADIOCHEMICAL ANALYSIS

006997
COWPER G
THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER NUCLEAR LABORATORIES
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER
12 PAGES, 5 FIGURES, 5 REFERENCES- FEBRUARY 1965, AECL-2154 (CONF-650302-3)(SM-56/29)- PRESENTED AT I. A. E. A. SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION, VIENNA, MARCH 8-12, 1965- AECL

THE FOLLOWING CONSIDERATIONS ARE IMPORTANT IN DEALING WITH EMERGENCY HIGH EXPOSURE LEVELS. (A) RELIABILITY OF METHODS IS OF GREATER IMPORTANCE THAN ACCURACY. (B) INSTRUMENTS AND METHODS WHICH RECEIVE ONLY OCCASIONAL USE SHOULD BE AS SIMPLE AS POSSIBLE. (C) ROUTINE SERVICES SHOULD HAVE THE CAPABILITY OF ABSORBING SUDDEN INCREASES IN WORK LOAD.

DOSIMETRY + *MONITOR, EMERGENCY + MONITOR, PERSONNEL + *RADIATION PROTECTION, ORGANIZATION + *CHALK RIVER + CONTAMINATION + PERSONNEL EXPOSURE, RADIATION

007577
DUMMER JE
GENERAL HANDBOOK FOR RADIATION MONITORING
LOS ALAMOS SCIENTIFIC LABORATORY
180 PAGES, FIGURES, TABLES, 28 REFERENCES- NOVEMBER 1958, LA-1835(3D. ED.)- GPO

THE FIRST EDITION OF THE GENERAL HANDBOOK FOR RADIATION MONITORING WAS PREPARED IN 1952 AS AN ATTEMPT TO PROVIDE THE MEMBERS OF THE MONITORING GROUP AT THE LOS ALAMOS SCIENTIFIC LABORATORY WITH THE BASIC DATA WHICH IT WAS FELT SHOULD BE AVAILABLE TO THEM AT ALL TIMES. THIS, THE THIRD EDITION, HAS BEEN ALMOST ENTIRELY REWRITTEN AND ITS PUBLICATION WAS DELAYED TO PERMIT INCLUSION OF THE MOST UP-TO-DATE DATA FOR PERMISSIBLE EXPOSURES AND PERMISSIBLE BODY BURDENS. THE FORMAT REMAINS UNCHANGED, HOWEVER, AND THE HANDBOOK IS STILL DESIGNED TO SERVE THE PURPOSES OF THE LOS ALAMOS SCIENTIFIC LABORATORY. NOT ALL OF THE QUANTITIES GIVEN HAVE OFFICIAL SANCTION- THERE ARE SOME INSTANCES WHERE OFFICIAL NUMBERS DO NOT EXIST, BUT IT IS NECESSARY TO ESTABLISH SOME LEVEL WHICH CAN SERVE AS A GUIDE IN LOCAL WORK.

*ADMINISTRATIVE CONTROL + DECONTAMINATION + DOSIMETRY + MPC + MONITOR, EMERGENCY + MONITOR, GENERAL PRACTICE + MONITOR, PERSONNEL + PERSONNEL PROTECTIVE DEVICE + REGULATION + SURVEY, EMERGENCY + MPD + SAMPLING + AIR + ANALYTICAL TECHNIQUE + GROSS ALPHA + GROSS BETA + GROSS GAMMA + RADIATION UNIT + LASL + RADIATION PROTECTION, ORGANIZATION + MONITOR + PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + EXCRETION, URINE

007416
PERRY KE
CONTINUOUS SAMPLING AND MEASUREMENT OF AIRBORNE ACTIVITY. SESSION III
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WINFRITH
30 PAGES, 10 FIGURES, 1 TABLE, 18 REFERENCES- 1963, CONF-365-6- PRESENTED AT JOINT HEALTH PHYSICS COMMITTEE AND CENTRAL ELECTRICITY GENERATING BOARD SYMPOSIUM ON ENVIRONMENTAL MONITORING, BERKELEY, GLOUCESTERSHIRE, OCTOBER 3-4, 1963

THE METHODS EMPLOYED FOR ENVIRONMENTAL SAMPLING AND MEASUREMENT FOR BOTH PARTICULATE AND GASEOUS AIRBORNE CONTAMINATION ARE DESCRIBED. A BRIEF DESCRIPTION IS GIVEN OF THE INSTRUMENTS THAT ARE IN CURRENT OPERATIONAL USE FOR CONTINUOUSLY MONITORING THE AIR FOR CONTAMINATION. A SUMMARY IS MADE OF NEW INSTRUMENTS AND TECHNIQUES AT PRESENT UNDER DEVELOPMENT.

COUNTER + NOBLE GAS + PARTICLE + PLUTONIUM + INSTRUMENT, AIR SAMPLING + *MONITOR, AIR + MONITOR, SAMPLING + *SAMPLING + GROSS ALPHA + GROSS BETA + INSTRUMENT, FLOW + SPECTROMETRY, ALPHA + RADIATION MONITORS + FILTERS

007680
IYENGAR TS + SADARANGANI SH + SOMASUNDARAM S + VAZE PK
A COLD STRIP APPARATUS FOR SAMPLING TRITIUM IN AIR
ATOMIC ENERGY ESTABLISHMENT, TROMBAY, INDIA
2 PAGES, 1 TABLE, 1 REFERENCE- HEALTH PHYSICS 11(4)- 313-314 (APRIL, 1965)

A COLD STRIP APPARATUS IS DESCRIBED FOR SAMPLING TRITIUM IN AIR. THE APPARATUS IS MORE CONVENIENT TO USE THAN THE NORMAL MOISTURE TRAP.

*HUMIDITY, RELATIVE + MONITOR, AIR + *SAMPLING

007852
JACKSON S + TAYLOR NA
A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES IN URINE
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL AND ALDERMASTON

007852 *CONTINUED*
25 PAGES, 6 TABLES, 45 REFERENCES- SM-52/16, P. 169 OF STI/PUB/84 (CONF-448-13)- SYMPOSIUM ON ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN, HEIDELBERG, FEDERAL REPUBLIC OF GERMANY, MAY 11-16, 1964

IN ASSESSING THE FUNCTION AND SCOPE OF URINE ANALYSIS, THE FACTORS AFFECTING THE CHOICE OF A SUITABLE ANALYTICAL METHOD ARE DISCUSSED. THE SENSITIVITY AND PRECISION OF THE METHOD MUST BE ADEQUATE IN RELATION TO THE MAXIMUM PERMISSIBLE BODY BURDEN, THE EXCRETION RATE AND THE SAMPLING FREQUENCY- THE METHOD MUST BE SUFFICIENTLY SPECIFIC OR SELECTIVE TO ELIMINATE THE POSSIBILITY OF INTERFERENCE BY OTHER RADIONUCLIDES- AND FINALLY, THE COST MUST BE ASSESSED IN RELATION TO ALL THESE FACTORS AND ALSO TO THE SPEED AND CONVENIENCE OF THE METHOD. THE ELEMENTS WHICH ARE OF GREATEST IMPORTANCE IN THE UKAE PROGRAMMES OF URINE ANALYSIS ARE PLUTONIUM, URANIUM, TRITIUM AND FISSION PRODUCTS (NOTABLY STRONTIUM 90 AND CAESIUM-137). FROM THE AVAILABLE DATA ABOUT THEIR METABOLISMS AN APPROXIMATE URINARY EXCRETION RATE IS PROPOSED FOR EACH OF THE ABOVE RADIONUCLIDES.

CARBON + CESIUM + ECONOMICS + *MPBB + PLUTONIUM + STRONTIUM + THORIUM + UNITED KINGDOM + URANIUM + PHOSPHORUS + POLONIUM + SAMPLING + SULFUR + *ANALYTICAL TECHNIQUE + GROSS ALPHA + GROSS BETA + PROTACTINIUM + RADIUM + AMERICIUM + EXCRETION, URINE

008150
BALKWELL WR + KUBOSE DA
DETERMINATION OF THE TOTAL TRITIUM ACTIVITY ADSORBED ON THE SURFACE OF VARIOUS METALS
U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
14 PAGES, 4 FIGURES, 2 TABLES, 4 REFERENCES- AUGUST 19, 1965, USNRDL-TR-890

THE TOTAL TRITIUM ACTIVITY ADSORBED ON STRUCTURAL STEEL, GALVANIZED STEEL, BRASS AND ALUMINUM WAS FOUND TO BE LESS THAN 10 MILLICURIES OF TRITIUM PER SQUARE CENTIMETER OF SURFACE FOR EXPOSURE CONCENTRATIONS OF 0.23 MILLICURIES OF TRITIUM PER CUBIC CENTIMETER IN AIR AND AN EXPOSURE TIME OF ONE HOUR. THE TOTAL TRITIUM ACTIVITY ADSORBED ON A CARBON STEEL SURFACE IS MUCH GREATER THAN FOR THE OTHER SURFACES. AN INCREASE IN THE TOTAL TRITIUM ACTIVITY ADSORBED WITH INCREASING TRITIUM EXPOSURE CONCENTRATION WAS OBSERVED FOR ALL THE METALS STUDIED. THE NATURE OF THIS INCREASE, ASSUMING A CLEAN SURFACE, APPEARS TO DEPEND ON THE SURFACE TEXTURE OF THE MATERIAL. AT A CONSTANT EXPOSURE CONCENTRATION (0.11 MILLICURIES OF TRITIUM PER CUBIC CENTIMETER) NO SIGNIFICANT CHANGE IN THE TOTAL TRITIUM ACTIVITY ADSORBED WAS OBSERVED FOR EXPOSURE TIMES FROM 15 MIN TO 4 HR.

ADSORPTION + METAL + *ANALYTICAL TECHNIQUE

008455
ENGELKE MJ
MODEL 200 AC/DC AIR SAMPLER
LOS ALAMOS SCIENTIFIC LABORATORY
LA-3228 +. 23 PAGES, 8 FIGURES- APRIL 7, 1965- CFSTI, $2.00

THE MODEL 200 AC/DC AIR SAMPLER IS A COMPLETELY PORTABLE, COMPACT INSTRUMENT FOR THE QUALITATIVE DETECTION OF RADIOACTIVE GASES IN THE ATMOSPHERE. IT IS USED IN THIS LABORATORY PRIMARILY FOR THE DETECTION OF TRITIUM IN THE AIR IN CONCENTRATIONS GREATER THAN 50 MICRO CURIES PER CUBIC METER. THE OPERATION, MAINTENANCE, AND PERFORMANCE IN THE FIELD OF THE AIR SAMPLER ARE DESCRIBED.

MAINTENANCE AND REPAIR + *INSTRUMENT, AIR SAMPLING + *MONITOR, AIR

008568
VOGT KJ
RADIOACTIVE AIR CONTAMINATION MEASUREMENT METHODS FOR NUCLEAR REACTOR FACILITY IN GERMANY
N69-30626 + JUL-566-ST +. 25 PAGES, DECEMBER 1968 (IN GERMAN)

MEASUREMENTS SUITABLE FOR AIR MONITORING FOLLOW FROM A CONSIDERATION OF THE POTENTIAL PATH OF THE DOSE. THE MEASUREMENT OF THE INHALDED DOSE FROM RADIOACTIVE AEROSOLS, RADIOIODINE AND TRITIUM IS THE MAIN OBJECT OF THIS STUDY. THE MOST IMPORTANT METHODS OF CONCENTRATION AND MEASUREMENT OF SAMPLES BY FIXED-FILTER METHODS AND BY CONTINUOUS FILTER-BAND APPARATUS ARE DISCUSSED. THE MONITORING OF IMMERSION DOSES AND RISKS OF INGESTION FROM RADIOACTIVE MATERIALS DEPOSITED ON THE GROUND IS TOUCHED ON. IN CONCLUSION, A BRIEF OVERVIEW IS GIVEN OF THE AIR-MONITORING SYSTEM OF THE KERNFORSCHUNGSANLAGE JULICH.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

FILTER SYSTEM + IODINE + *INSTRUMENT, AIR SAMPLING + MONITOR, AIR + AEROSOL, RADIOACTIVE + MONITOR, SURFACE + *GERMANY + *MONITORING SYSTEM, RADIATION + RADIATION MONITORS

008679
SANNES F + BANVILLE R
A PORTABLE TRITIUM-IN-AIR MONITOR
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER
AECL-2283 +. 17 PAGES, 9 FIGURES- JULY 1965- DEP/MN- AECL $0.20

THE SCINTILLATIONS PRODUCED BY BETA RAYS FROM TRITIUM ARE DETECTED BY TWO PHOTOMULTIPLIER TUBES. THE INSTRUMENT WAS DESIGNED FOR USE NEAR HEAVY WATER REACTORS WHERE STRONG GAMMA FIELDS ARE LIKELY. THE INSTRUMENT IS COMPENSATED AGAINST GAMMA. UNDER IDEAL CONDITIONS, THE INSTRUMENT CAN DETECT 0.2 MPC OF TRITIUM OR 1 MICRO-MICRO CURIE PER CC OF AIR. THE RESPONSE TIME IS ONE MINUTE.

008679 *CONTINUED*
THE MONITOR MAY BE USED AS A CONTINUOUSLY RECORDING MONITOR OR AS A PORTABLE INSTRUMENT.

*MONITOR, AIR + *CHALK RIVER + RADIATION MONITORS

008680
BANVILLE B
CALIBRATION OF TRITIUM-IN-AIR MONITORS
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER
AECL-2265 +. 18 PAGES, 2 FIGURES- MAY 1965- AECL

A METHOD PRIMARILY INTENDED FOR THE CALIBRATION OF CONTINUOUS TRITIUM-IN-AIR DETECTORS FOR TRITIUM IN THE FORM OF WATER VAPOR IS PRESENTED. THE SYSTEM CONSISTS ESSENTIALLY OF A SOURCE OF DRY AIR WHICH IS BUBBLED INTO TRITIATED WATER UNDER CONTROLLED CONDITIONS BEFORE BEING PASSED THROUGH THE DETECTOR UNDER TEST. THE AIR FLOWS THROUGH A HIGH EFFICIENCY TRITIUM WATER VAPOR COLLECTOR. THE VOLUME OF AIR SAMPLED AND THE CONCENTRATION OF THE TRITIUM IN THE TRITIUM COLLECTOR GIVE THE ACTIVITY OF THE AIR SAMPLED IN THE DETECTOR UNDER TEST.

*MONITOR, AIR + *CHALK RIVER + *INSTRUMENT, TESTING + TEST, INSTRUMENT RESPONSE + RADIATION MONITORS

008709
CORTI F
DETERMINATION OF TRITIUM CONTENT IN SAMPLES (A REVIEW) PART, I.
INSTITUTO SUPERIORE DI SANITA
ISS-65/8 +. 64 PAGES, 8 FIGURES, 69 REFERENCES- MARCH 24, 1965

AFTER A BRIEF DESCRIPTION OF THE PHYSICAL PROPERTIES OF TRITIUM, OF ITS USE IN SCIENTIFIC RESEARCH AND OF ITS MAXIMUM PERMISSIBLE DOSE, SOME METHODS, USED IN PREPARING TRITIATED SAMPLES TO BE DIRECTLY MEASURED, ARE REVIEWED. DIFFERENT PROCESSES IN THE HANDLING OF SAMPLES ARE DESCRIBED ACCORDING TO THE MATERIALS AND THE MEASUREMENT TECHNIQUE. AFTER A BRIEF EXPLANATION OF THE SENSITIVITY LIMITS OF INSTRUMENTS, NOW ON THE MARKET, SOME METHODS ARE DESCRIBED FOR ENRICHING TRITIATED SAMPLES THAT ARE NOT SUFFICIENTLY ACTIVE.

*SAMPLING + ANALYTICAL TECHNIQUE + ITALY + INSTRUMENTS, MISC.

009238
BALKWELL WR + KUBOSE DA
A LABORATORY APPARATUS FOR MEASURING THE AMOUNT OF TRITIUM ACTIVITY REMOVED FROM A CONTAMINATED SURFACE, BY DIRECT CONTACT WITH THE SURFACE
U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, SAN FRANCISCO, CALIF.
USNRDL-TR-913 +. 29 PAGES, 19 FIGURES, 3 TABLES- NOVEMBER 29, 1965- CFSTI, $2.00 CY, $0.50 MN

AN APPARATUS IS DESCRIBED THAT CAN BE USED TO OBTAIN DATA FOR EVALUATION OF THE HEALTH HAZARD TO PERSONNEL WHO DIRECTLY CONTACT A SURFACE CONTAMINATED WITH TRITIUM. THE SAMPLING COMPONENT IS A SMALL GLASS ROLLER WRAPPED WITH A STRIP OF FILTER PAPER DAMPENED WITH ETHYLENE GLYCOL. IT IS ROLLED OVER THE CONTAMINATED SURFACE TO SAMPLE THE ACTIVITY. THE SAMPLING APPARATUS HAS ADJUSTMENTS TO VARY THE SURFACE CONTACT TIME, THE AREA OF SURFACE SAMPLED, AND THE PRESSURE APPLIED. AFTER A RUN, THE CONTAMINATED ROLLER IS DROPPED IMMEDIATELY AFTER CONTACT WITH THE SURFACE INTO A COUNTING VIAL CONTAINING A SCINTILLANT SOLUTION, AND THE ACTIVITY IS ASSAYED. THE APPARATUS IS SMALL ENOUGH TO BE OPERATED IN A CONVENTIONAL GLOVE BOX.

*SURFACE CONTAMINATION + *SAMPLING + DESORPTION + *PERSONNEL EXPOSURE, RADIATION + INSTRUMENTS, MISC.

011130
BURT AK + GIBSON JA
A METHOD FOR CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL
JOURNAL OF NUCLEAR ENERGY 20 (3), PAGES 185-190, 6 FIGURES, 7 REFERENCES, 1966

AN INSTRUMENT HAS BEEN DEVELOPED FOR THE CONTINUOUS MEASUREMENT OF TRITIUM (AS HTO) IN AIR IN THE VICINITY OF A HEAVY-WATER REACTOR. WATER IS CONDENSED CONTINUOUSLY FROM THE AIR AT THE RATE OF 10G/HR, AND THE TRITIUM ACTIVITY IS MEASURED IN A FLOW CELL FILLED WITH ANTHRACENE CRYSTALS. THE METHOD WAS DEVELOPED TO IMPROVE THE SENSITIVITY OF DETECTION FROM 2.5 PC/CU.CM FOR AN ION CHAMBER SYSTEM TO ENABLE THE CHRONIC LEVEL OF 0.4 PC/CU.CM (0.08 MPC FOR AIR) TO BE CONTINUOUSLY MEASURED. THE RANGE OF THE INSTRUMENT, USING A LOGARITHMIC RATEMETER, IS FROM THE BACKGROUND SENSITIVITY OF 0.1 TO 1000 PC/CU.CM (250 MPC). THE INSTRUMENT CAN BE OPERATED IN A HIGH GAMMA-RAY BACKGROUND AND DOES NOT DETECT RADIOACTIVE GASES SUCH AS AR-41. CONTAMINATION OF THE CELL IS RAPIDLY REMOVED FOLLOWING A LARGE RELEASE OF TRITIUM ACTIVITY.

DECONTAMINATION + REACTOR, HWR + *INSTRUMENT, AIR SAMPLING + *MONITOR, AIR

011470
GIBSON JA + BURT AK
A METHOD FOR CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, ENGLAND
AERE-R-4967 +. 10 PAGES, JUNE 1965, UKAEA

011470 *CONTINUED*

AN INSTRUMENT WAS DEVELOPED FOR CONTINUOUSLY MEASURING TRITIUM (HTO) IN AIR IN THE VICINITY OF A HEAVY-WATER-MODERATED REACTOR. WATER IS CONDENSED CONTINUOUSLY FROM THE AIR AT THE RATE OF 10 G/HR, AND THE TRITIUM ACTIVITY IS MEASURED IN A FLOW CELL FILLED WITH ANTHRANCENE CRYSTALS. THE METHOD WAS DEVELOPED TO IMPROVE THE SENSITIVITY OF DETECTION FROM 2.5 PC/CC FOR AN ION CHAMBER SYSTEM TO ENABLE THE CHRONIC LEVEL OF 0.4 PC/CC (0.08 OF THE MPC FOR AIR) TO BE CONTINUOUSLY MEASURED. THE RANGE OF THE INSTRUMENT, USING A LOGARITHMIC RATEMETER, IS FROM THE BACKGROUND SENSITIVITY OF 0.1 PC/CC TO 1000 MPC. THE INSTRUMENT CAN BE OPERATED IN A HIGH GAMMA-RAY BACKGROUND AND DOES NOT DETECT RADIOACTIVE GASES SUCH AS AR-41. CONTAMINATION OF THE CELL IS RAPIDLY REMOVED AFTER A LARGE RELEASE OF TRITIUM.

COUNTER + *WATER + *INSTRUMENT, AIR SAMPLING + MONITOR, AIR + MONITOR, SAMPLING

013347
BUTTLAR HV
TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE
TECHNICAL UNIVERSITY OF MUNCHEN
5 PAGES, 7 FIGURES, 12 REFERENCES, NUCLEAR INSTRUMENTS AND METHODS 37(2), PAGES 288-92, (DECEMBER 1965)

SAMPLE WATER IS CONVERTED TO HYDROGEN GAS AND THEN CONTACTED WITH ETHYLENE TO YIELD ETHANE. THE TRITIUM RADIOACTIVITY IS COUNTED IN AN DESCHGER-TYPE COUNTER IN THE LIMITED PROPORTIONAL REGION. A TRANSISTORIZED ELECTRONIC CIRCUIT ALLOWS SIMULTANEOUS REGISTRATION OF TRITIUM COUNTS PLUS BACKGROUND BELOW, AND MAINLY BACKGROUND ABOVE ABOUT 15 KEV. WITH A GEOMETRIC VOLUME OF THE CENTRAL TRITIUM COUNTER OF 2.9 LITERS, THE ANTICOINCIDENCE BACKGROUND IS 2.74 PLUS-OR-MINUS 0.03 CPM IN THE TRITIUM CHANNEL. A SAMPLE OF 100 TU HAS A SAMPLE COUNTING RATE OF 1.32 CPM WHEN THE ETHANE PRESSURE IS 750 MM HG. DETAILS ABOUT BACKGROUND TRITIUM SPECTRUM, EFFICIENCY, RELIABILITY AND LONG-TIMES STABILITY ARE GIVEN. THE TRITIUM CONCENTRATIONS OF WATER SAMPLES FROM RHINE AND MAIN RIVER TAKEN BETWEEN 1961 AND 1964 SHOW PRONOUNCED MAXIMA IN THE SUMMER, ABOUT TWO MONTHS LATER AND A FACTOR 5 SMALLER THAN THE RAIN MAXIMA. WINTER MINIMA DIFFER BY A FACTOR OF 2.

COUNTER + *SURFACE WATER, NUCLIDE OCCURRENCE + *ANALYTICAL TECHNIQUE + GERMANY

013772
COWPER G + OSBORNE RV
MEASUREMENT OF TRITIUM IN AIR IN THE PRESENCE OF GAMMA RADIATION
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, CANADA
IRPA-42 +. 8 FIGURES, 5 REFERENCES, 13 PAGES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

A HIGH FLUX HEAVY WATER REACTOR PRODUCES TRITIUM COPIOUSLY. SINCE LEAKAGE OF HEAVY WATER FROM THE MODERATOR OR THE COOLANT CIRCUIT WILL LEAD TO TRITIATED WATER VAPOUR IN NEARBY AIR IN POSSIBLY HAZARDOUS CONCENTRATIONS, A MEANS FOR MEASURING TRITIUM IN AIR IS NEEDED. OFTEN SUCH MEASUREMENTS HAVE TO BE MADE IN PLACES WHERE THERE ARE ALSO SIGNIFICANT LEVELS OF GAMMA RADIATION SO THE DETECTING DEVICE MUST BE CAPABLE OF DISTINGUISHING BETWEEN THE LOW ENERGY BETAS FROM TRITIUM AND GAMMA RADIATION. THE EXTENT OF THIS PROBLEM IS ILLUSTRATED BY THE FACT THAT 1 (MPC) OF TRITIUM PRODUCES ONLY AS MUCH IONIZATION IN AIR AS A GAMMA RADIATION FIELD OF 50 MICROROENTGENS PER HOUR. ANOTHER IMPORTANT ASPECT OF THE PROBLEM IS THAT THE CONCENTRATION OF TRITIUM IN AIR MAY LIE WITHIN VERY WIDE LIMITS DEPENDING UPON THE PARTICULAR CIRCUMSTANCES OF THE RELEASE. SEVERAL METHODS HAVE BEEN DEVELOPED TO MEET THIS REQUIREMENT USING LARGE GAMMA-COMPENSATED IONIZATION CHAMBERS FOR INSTALLED AREA MONITORS, SMALL VOLUME COMPENSATED CHAMBERS COMPLETE WITH BATTERY OPERATED ELECTROMETERS FOR PORTABLE USE AND SCINTILLATION DETECTORS WHICH ACHIEVE DISCRIMINATION IN FAVOR OF TRITIUM BY SPECIAL CIRCUIT TECHNIQUES. THE DESIGN OF THESE DEVICES AND THEIR APPLICATION IN THE CANADIAN HEAVY WATER PROGRAM WILL BE DISCUSSED.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

COUNTER + *REACTOR, HWR + *AIR + ANALYTICAL TECHNIQUE

013775
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
18 PAGES, FEBRUARY 1965

ACTIVITIES FOR FEBRUARY 1965 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013776
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
19 PAGES, OCTOBER 1964

013776 *CONTINUED*
ACTIVITIES FOR OCTOBER 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013777
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
22 PAGES, JULY 1964

ACTIVITIES FOR JULY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IN REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013778
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
18 PAGES, JUNE 1964

ACTIVITIES FOR JUNE 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013779
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY USAEC, NEW YORK OPERATIONS OFFICE
23 PAGES, MAY 1964

ACTIVITIES FOR MAY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATION OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013780
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY USAEC, NEW YORK OPERATIONS OFFICE
24 PAGES, APRIL 1964

ACTIVITIES FOR APRIL 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATION OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013781
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
24 PAGES, MARCH 1964

ACTIVITIES FOR MARCH 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013782
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
19 PAGES, FEBRUARY 1964

ACTIVITIES FOR FEBRUARY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013783
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
19 PAGES, JANUARY 1964

ACTIVITIES FOR JANUARY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013784
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
21 PAGES, DECEMBER 1963

ACTIVITIES FOR DECEMBER 1963 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013794
CAMERON JF + PAYNE BR
APPARATUS FOR CONCENTRATION AND MEASUREMENT OF LOW TRITIUM ACTIVITIES
CONF-650652 + GMELIN-AED-CONF-65-158 +. 17 PAGES, 6 FIGURES, 3 TABLES, 25 REFERENCES, PAGES 454-470, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

USEFUL HYDROLOGICAL AND METEOROLOGICAL INFORMATION CAN BE OBTAINED FROM MEASUREMENTS OF THE NATURAL TRITIUM CONTENT OF PRECIPITATION, SURFACE WATER AND GROUND WATER. PROJECTS IN WHICH NATURAL TRITIUM IS USED GENERALLY ENTAIL THE MEASUREMENT OF LARGE NUMBERS OF SAMPLES AND CONSEQUENTLY THE ASSAY SYSTEM SHOULD BE DESIGNED TO MEASURE A MAXIMUM NUMBER OF SAMPLES. THE SYSTEM DESCRIBED IS DESIGNED FOR ROUTINE CONCENTRATION AND MEASUREMENT OF A MAXIMUM NUMBER OF SAMPLES WITH ACTIVITIES GREATER THAN 0.5 T.U. WITH AN ACCURACY OF ABOUT PLUS OR MINUS 5% OR PLUS OR MINUS 0.5 T.U.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S.

013794 *CONTINUED*
DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

*COUNTER + *ANALYTICAL TECHNIQUE + METEOROLOGICAL SUPPORT + HYDROLOGY + CONCENTRATION

013795
BUTTLAR HV + FARZINE K + WOHLFAHRT D
TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE
INSTITUT FUR TECHNISCHE KERNPHYSIK DER TECHNISCHEN HOCHSCHULE DARMSTADT
CONF-650652 + GMELIN-AED-CONF-65-158 +. 16 PAGES, 7 FIGURES, 12 REFERENCES, PAGES 471-486, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

SAMPLE WATER IS CONVERTED TO HYDROGEN GAS AND THEN REACTED WITH ETHYLEN TO YIELD ETHANE. THE TRITIUM RADIOACTIVITY IS COUNTED IN AN OESCHGER-TYPE COUNTER IN THE LIMITED PROPORTIONAL REGION. A TRANSISTORIZED ELECTRONIC CIRCUIT ALLOWS SIMULTANEOUS REGISTRATION OF TRITIUM COUNTS PLUS BACKGROUND BELOW, AND MAINLY BACKGROUND ABOVE ABOUT 15 KEV. WITH A GEOMETRIC VOLUME OF THE CENTRAL TRITIUM COUNTER OF 2.9 LITERS, THE ANTICOINCIDENCE BACKGROUND IS 2.74 PLUS OR MINUS 0.03 CPM IN THE TRITIUM CHANNEL. A SAMPLE OF 100 TU HAS A SAMPLING COUNTING RATE OF 1.32 CPM WHEN THE ETHANE PRESSURE IS 750 MM HG. DETAILS ABOUT BACKGROUND, TRITIUM SPECTRUM, EFFICIENCY, RELIABILITY, AND LONG-TIME STABILITY ARE GIVEN. THE TRITIUM CONCENTRATIONS OF WATER SAMPLES FROM RHINE AND MAIN RIVER TAKEN BETWEEN 1961 AND 1964 SHOW PRONOUNCED MAXIMA IN THE SUMMER, ABOUT TWO MONTHS LATER AND A FACTOR 5 SMALLER THAN THE RAIN MAXIMA. WINTER MINIMA DIFFER BY A FACTOR OF 2.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

COUNTER + *SURFACE WATER, NUCLIDE OCCURRENCE + ANALYTICAL TECHNIQUE + GERMANY

013796
AKHTAR S + SMITH HA
CONCENTRATION, STORAGE, AND DETERMINATION OF TRITIUM AT ACTIVITY LEVELS OF 10(MINUS 8TH) TO 10(MINUS 10TH) MOLE PERCENT
UNIVERSITY OF TENNESSEE
CONF-650652 + GMELIN-AED-CONF-65-158 +. 14 PAGES, 2 FIGURES, 11 REFERENCES, PAGES 491-504, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

NATURALLY OCCURRING OR EXTERNALLY ADDED TRITIUM IS A VALUABLE TRACER IN MANY GEOPHYSICAL AND HYDROLOGICAL INVESTIGATIONS. FROM THE POINT OF VIEW OF ANALYTICAL INTEREST, WHICH IS THE SUBJECT MATTER OF THIS PAPER, THESE STUDIES INVOLVE DETERMINATION OF TRITIUM, USUALLY IN WATER, AT TWO DIFFERENT LEVELS OF ACTIVITY, NAMELY THE ACTIVITY LEVEL OF THE ORDER OF A MILLIMICROCURIE PER MILLILITER OF THE SAMPLE AND THE FAR LOWER LEVEL OF A FEW TRITIUM UNITS (T.U.).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

TRACER, RADIOACTIVE + *ANALYTICAL TECHNIQUE + HYDROLOGY

013806
VERHAGEN BT + SELLSCHOP JP
TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES
UNIVERSITY OF THE WITWATERSRAND, SOUTH AFRICA
CONF-650652 + GMELIN-AED-CONF-65-158 +. 12 PAGES, 9 FIGURES, PAGES 659-670, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

DATA ARE PRESENTED ON THE TRITIUM CONTENT OF SOME SUBTERRANEAN WATERS OF SOUTH AFRICA. A THERMAL DIFFUSION SYSTEM WAS USED FOR ENRICHMENT OF TRITIUM. COUNTING IS DONE WITH A GAS PROPORTIONAL COUNTER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

COUNTER + *ANALYTICAL TECHNIQUE + *GROUND WATER, NUCLIDE OCCURRENCE + SOUTH AFRICA

013925
TAKAHASHI T
MEASUREMENT OF TRITIUM AT NATURAL LEVELS
NSJ-TR-49 +. 10 PAGES, TRANSLATED FROM GENSHIRYOKU KOGYO 10(2) PAGES 65-8, (1964)

TO MEASURE THE CONCENTRATION OF TRITIUM IN NATURAL WATERS, THE DISTILLED SAMPLE AND NAOH WERE PUT INTO AN ELECTROLYTIC CELL, AND, BY USING ELECTRODES OF NI AND STAINLESS STEEL, ELECTROLYSIS WAS CARRIED OUT AT 0.15 AMP/CM OF CURRENT DENSITY AND 10.5 C. WHEN THE VOLUME OF SAMPLE WAS CONDENSED TO 1/12 OF THE INITIAL VOLUME, THE CONCENTRATION OF T WAS 8 TO 10 TIMES AS MUCH AS THAT IN THE INITIAL SAMPLE. THE INITIAL CONCENTRATION OF T CALCULATED FROM THE MEASURED VALUE ON THE BASIS OF THE CONCENTRATION RATIO OF HEAVY WATER WAS IN AGREEMENT WITH THE ACTUAL CONCENTRATION OF T. THE HYDROGEN GENERATED BY CONTACTING THE SAMPLE VAPOR WITH A MG CHIP AT 570 TO 600 C FILLED THE COUNTING TUBE. THE COUNTING TUBE IS SURROUNDED BY ANTICOINCIDENCE TUBES. THE CONTENTS OF T IN RIVER WATER AND TAP WATER AT SEVERAL PLACES IN JAPAN WERE MEASURED. IN 1962, THE CONTENT OF T IN TAP WATER WAS ABOUT 100 T.U.

013925 *CONTINUED*
AVAILABILITY - FOR SALE BY THE SPECIAL LIBRARIES ASSOCIATION TRANSLATION CENTER, JOHN CRERAR LIBRARY, 35 WEST 33RD STREET, CHICAGO ILLINOIS 60616, $1.10 COPY, $0.80 MICROFICHE

*SURFACE WATER, NUCLIDE OCCURRENCE + *ANALYTICAL TECHNIQUE + JAPAN

014861
N S SAVANNAH CHANGE 5 - MISC. ADMINISTRATION AND TESTING
DIVISION OF REACTOR LICENSING, UNITED STATES ATOMIC ENERGY COMMISSION
9 PAGES, FEBRUARY 5, 1967, DOCKET NO. 50-238

CHANGES ALLOWED ARE - (1) CHANGE IN ORGANIZATIONAL TITLES, (2) PROVIDE FOR TRITIUM MONITORING IN WASTE DISPOSAL, (3) LESS FREQUENT EVACUATION DRILLS, (4) CLARIFY REPORTING RESPONSIBILITY OF STAFF HEALTH PHYSICIST, (5) ALTER CHANNEL 10 AND 11 REQUIREMENTS OF RADIATION MONITORING DURING FILTER TESTS, AND (6) ALLOW PORT ENTRY IF A DOP TEST WITHIN 1 WEEK PAST SHOWED A FILTER FACTOR OF 1000 OR MORE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

ADMINISTRATIVE CONTROL + REACTOR, MARITIME + NS SAVANNAH (PWR) + REACTOR, PWR + WASTE DISPOSAL + TEST, DOP FILTER + CONTAINMENT FILTERING SYSTEM + *TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + RADIATION MONITORS

015267
OSBORNE RV + COWPER G
THE DETECTION OF TRITIUM IN AIR WITH IONIZATION CHAMBERS
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-2604 +. 22 PAGES, 16 FIGURES, 5 REFERENCES, OCTOBER 1966

MONITORS FOR DETECTING TRITIUM IN AIR IN THE PRESENCE OF GAMMA RADIATION HAVE BEEN MADE BY MOUNTING, COAXIALLY, A SEALED IONIZATION CHAMBER INSIDE AN IONIZATION CHAMBER WHICH CAN SAMPLE THE SURROUNDING AIR. THE EFFECTIVE VOLUME OF THE OUTER CHAMBER IS EQUAL TO THAT OF THE SEALED CHAMBER, AND ONLY THE DIFFERENCE IN CURRENT FROM THE PAIR OF CHAMBERS IS MEASURED. IN THIS WAY AS MUCH AS 98% OF THE GAMMA CONTRIBUTION TO THE IONIZATION CURRENT IN THE OUTER CHAMBER CAN IN PRACTICE BE CANCELLED OUT. SAMPLING RATES ARE HIGH ENOUGH FOR THE RESPONSE TIMES OF THE MONITORS TO BE LESS THAN ONE MINUTE.

AVAILABILITY - ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO $1.00 COPY

INSTRUMENT, NUCLEAR + MONITOR, PERSONNEL + *MONITOR, AIR

016938
LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA
STI-DOC-10/60 +. 196 PAGES, 42 FIGURES, 10 TABLES, 6 REFERENCES, TECHNICAL REPORTS SERIES NO. 60, AUGUST 1966

THIS MANUAL CONTAINS LECTURE MATERIAL AND LABORATORY EXERCISES APPLICABLE TO A BASIC COURSE ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH. BASIC CONCEPTS OF NUCLEAR PHYSICS, RADIATION DETECTION, AND HEALTH PHYSICS ARE DISCUSSED, AND APPLICATIONS OF THE BASIC PRINCIPLES ARE DISCUSSED. EIGHTEEN LABORATORY EXERCISES ARE GIVEN TO ILLUSTRATE THE USE OF VARIOUS RADIATION DETECTION INSTRUMENTS. 13 OTHERS COVER TRACER STUDIES IN RATS, DOGS, AND FROGS. ONE SHOWS THE ACUTE EFFECTS OF RADIATION ON RATS. THE MATERIAL IS WELL ORGANIZED, AND EACH SECTION IS FOLLOWED BY A BIBLIOGRAPHY. THE APPENDIXES PRESENT INFORMATION PERTINENT TO THE STUDIES.

AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY, NEW YORK OR GENEVA, $4.00 COPY

BIOMEDICAL + ECOLOGY + COUNTER + DECONTAMINATION + *HEALTH PHYSICS TRAINING + TRACER, RADIOACTIVE + ANIMAL + *CONCENTRATION + *RADIATION EFFECT + RADIATION MONITORS

016975
FREJAVILLE G
ATMOSPHERIC TRITIUM. MEASUREMENT AND APPLICATION
CENTRE D ETUDES NUCLEAIRES DE SACLAY, FRANCE
CEA-BIB-76 +. 26 PAGES, FIGURES, TABLES, FEB. 1967 (IN FRENCH)

THE POSSIBLE ORIGINS OF ATMOSPHERIC TRITIUM ARE REVIEWED AND DISCUSSED. DESCRIBES ENRICHMENT (ELECTROLYSIS AND THERMAL DIFFUSION) AND COUNTING (GAS COUNTERS AND LIQUID SCINTILLATION COUNTERS) PROCESSES WHICH CAN BE USED FOR DETERMINING ATMOSPHERIC TRITIUM CONCENTRATIONS. EXAMPLES ILLUSTRATES THE USE OF ATMOSPHERIC TRITIUM FOR RESOLVING A CERTAIN NUMBER OF HYDROLOGICAL AND GLACIOLOGICAL PROBLEMS.

AVAILABILITY - SERVICE DE DOCUMENTATION DU C.E.A., CENTRE D ETUDES NUCLEAIRES DE SACLAY, B.P. NO. 2, GIF-SUR-YVETTE, FRANCE

COUNTER + *ANALYTICAL TECHNIQUE + HYDROLOGY + METEOROLOGY + RADIATION MONITORS

017268
LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS SERIES NO. 61
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA
STI-DOC-10/61 +. 144 PAGES, 29 FIGURES, 9 TABLES, AUGUST, 1966

GENERAL AND BASIC INFORMATION ENCOMPASSING THE PROPERTIES OF RADIOISOTOPES AND RADIATIONS, THE METHODS OF RADIATION DETECTION, THE APPLICATION AND USES OF THE BASIC PROPERTIES OF RADIOISOTOPES AND RADIATIONS, AND THE PRECAUTIONS AND PROCEDURES NECESSARY FOR THE SAFETY OF THE INDIVIDUAL IN THEIR USE ARE PRESENTED IN LECTURE FORM.

AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY, NEW YORK OR GENEVA, $3.50

CRUSTACEAN + *ECOLOGY + COUNTER + DOSE + TRACER, RADIOACTIVE + TRACER, GAS + ANALYTICAL TECHNIQUE + *RADIATION SAFETY AND CONTROL + RADIOISOTOPE + RADIATION EFFECT

021195
PRINCE JR + WANG CH
A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA EMITTERS
OREGON STATE UNIVERSITY
5 PAGES, 4 TABLES, 8 REFERENCES, PAGES 179 TO 183 OF SURFACE CONTAMINATION, PERGAMON PRESS, NEW YORK, PROCEEDINGS OF A SYMPOSIUM HELD AT GATLINBURG, TENN., JUNE 1964

THE PURPOSE OF THIS REPORT IS TO SHOW HOW THE TECHNIQUE OF LIQUID SCINTILLATION COUNTING OF PAPER STRIPS CAN BE APPLIED TO THE PROBLEM OF EVALUATING SWIPES FROM SURFACES CONTAMINATED WITH SOFT BETA EMITTERS. FACTORS TO BE CONSIDERED IN APPLICATION OF THE METHOD ARE - (1) THE COUNTING EFFICIENCY, WHICH CAN BE AFFECTED BY THE TYPE OF FILTER PAPER, THE COMPOSITION OF THE COUNTING SOLUTION, AND THE SOLUBILITY OF THE RADIOCONTAMINANT IN THE COUNTING SOLUTION, AND (2) THE PARAMETERS WHICH INFLUENCE THE SWIPE TEST SUCH AS SURFACE POROSITY, WET OR DRY SWIPE, ETC.

AVAILABILITY - PERGAMON PRESS, 44-01 21ST ST., LONG ISLAND CITY, NEW YORK 11101

SURFACE CONTAMINATION + BETA EMITTER + *CONTAMINATION

021668
PORTER SW + SLABACK LA
MEASUREMENT OF TRITIUM SURFACE CONTAMINATION
ARMED FORCES RADIOBIOLOGY RESEARCH INST., BETHESDA, MD.
AD-640810 + AFRRI-SP-66-13 + CONF-660403-4 +. 18 PAGES, REFERENCES, JULY 1966, FROM INTERNATIONAL SYMPOSIUM ON RADIOLOGICAL PROTECTION OF THE WORKER BY THE DESIGN AND CONTROL OF HIS ENVIRONMENT, BOURNEMOUTH, ENG.

DESCRIBES SEVERAL METHODS FOR MEASURING TRITIUM SURFACE CONTAMINATION IN REACTOR, ACCELERATOR, AND TRITIUM OXIDE ENVIRONMENTS. THE PROBLEMS ASSOCIATED WITH THE PRESENTLY USED METHOD OF WINDOWLESS FLOW-PROPORTIONAL COUNTING ARE DISCUSSED. A NEW METHOD OF UTILIZING SPECIAL MEMBRANE SWIPE PAPERS COUNTED IN A LIQUID SCINTILLATION SYSTEM IS DESCRIBED. THE DATA FROM SINGLE CHANNEL AND CHANNEL RATIO LIQUID SCINTILLATION COUNTING TECHNIQUES, VARIOUS SWIPE PAPERS AND VARIOUS TRITIUM ABSORPTION AGENTS ARE PRESENTED WITH A STATISTICAL ANALYSIS. VARIOUS FACTORS AFFECTING LIQUID SCINTILLATING COUNTING OF INORGANIC TRITIUM ARE DISCUSSED. THIS METHOD GIVES ABOUT 20% EFFICIENCY WITH GOOD STATISTICS, VERSUS 1% EFFICIENCY AND VERY POOR COUNTING STATISTICS FOR FLOW-PROPORTIONAL COUNTING OF TRITIUM ON SWIPE PAPERS. FROM THE STANDPOINT OF OVERALL COUNTING EFFICIENCY, REPRODUCIBILITY OF COUNTS, EASE OF COUNTING, AND PHYSICAL STRENGTH, THE VINYL MEMBRANE VM-1 PAPER COUNTED IN DIOXANE WAS BEST FOR GENERAL TRITIUM SURFACE-CONTAMINATION MEASUREMENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

*COUNTER + *MEASUREMENT + OXIDE + *CONTAMINATION + REACTOR POWER + ACCELERATOR + *STATISTICAL ANALYSIS

021994
OSBORNE RV
MONITORING FOR TRITIUM AT LOW LEVELS
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO. CHALK RIVER NUCLEAR LABS.
AECL-2700 + CONF-670604-6 +. 9 PAGES, 10 FIGURES, 8 REFERENCES, JULY 1967, PRESENTED AT IAEA SYMPOSIUM ON INSTRUMENTS AND TECHNIQUES FOR THE ASSESSMENT OF AIRBORNE RADIOACTIVITY IN NUCLEAR OPERATION, VIENNA, AUSTRIA

DIRECT MEASUREMENT OF TRITIATED WATER VAPOUR (HTO) IN AIR AT LEVELS BELOW 1 MPC (AIR) IS DIFFICULT WITH EXISTING INSTALLED OR PORTABLE MONITORS. HOWEVER, AN INDIRECT MEASUREMENT CAN BE OBTAINED BY MAKING FREQUENT ROUTINE DETERMINATIONS OF THE AMOUNT OF TRITIUM ABSORBED BY THE WORKERS WHO ARE CHRONICALLY EXPOSED. IN ADDITION, INDIVIDUAL DOSES MAY BE ESTIMATED DIRECTLY. FOR THIS APPROACH TO AREA MONITORING TO BE USEFUL TO A HEALTH PHYSICIST, RAPID, DIRECT MEASUREMENT OF HTO INTAKE IS NEEDED. IT WILL DETECT BODY BURDENS OF TRITIUM RESULTING FROM CHRONIC EXPOSURES TO 0.05 (MPC)A. URINE IS VOIDED INTO A URINAL ATTACHED TO THE ANALYSER, A SAMPLE IS AUTOMATICALLY METERED AND MIXED WITH LIQUID SCINTILLATOR AND THE TRITIUM ACTIVITY IS THEN MEASURED. THE ASSAY TAKES LESS THAN 2 MIN. PERFORMANCE OF THE INSTRUMENT IS AUTOMATICALLY CHECKED BY PROCESSING STANDARD AND BACKGROUND SAMPLES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

ADSORPTION + CANADA + *ANALYTICAL TECHNIQUE + CHALK RIVER + *CONCENTRATION + EXCRETION, URINE + MAN + RADIATION MONITORS

023245
BAKER RP + RICHARDS D
RELIABLE AND VERSATILE INSTRUMENTATION FOR DETECTION OF TRITIUM HAZARD DESIGNED FOR MILITARY APPLICATION
SANDIA CORPORATION, DIVISION 2441, ALBUQUERQUE, NEW MEXICO
1 PAGE, ABSTRACT IN HEALTH PHYSICS 13, PAGE 926, (1967), PAPER PRESENTED AT THE TWELFTH ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY, WASHINGTON, D. C., JUNE 18-22, 1967

A NEW SET OF INSTRUMENTS HAS BEEN DEVELOPED BECAUSE EXPERIENCE IN TRITIUM MONITORING OVER THE PAST DECADE HAS LED TO CHANGES IN INSTRUMENT APPLICATION AND INDICATED SHORTCOMINGS IN PRESENT SYSTEMS. THE BASIC ELEMENT IN THE NEW INSTRUMENTATION IS A SMALL ION CHAMBER INSTRUMENT UTILIZING A DYNAMIC CAPACITOR INPUT-SOLID STATE ELECTROMETER. THIS BASIC MONITOR IS AUGMENTED BY INDICATING, RECORDING, AND ALARM INSTRUMENTS. AN ADAPTER ENABLES THE BASIC MONITOR TO BE UTILIZED FOR TRITIUM URINALYSIS. THE ENTIRE SET OF INSTRUMENTS HAS BEEN TESTED FOR RELIABILITY AND ACCURACY IN MILITARY ENVIRONMENTAL CONDITIONS.

*MONITOR, LIQUID + *MONITOR, GAS + MILITARY CONSIDERATION

023269
HOY JF
TRITIUM MEASUREMENT BY GAS-SOLID CHROMATOGRAPHY
SAVANNAH RIVER LAB., E. I. DU PONT DE NEMOURS AND CO., AIKEN, S. C.
1 PAGE, ABSTRACT IN HEALTH PHYSICS 13, PAGE 933, (1967), PAPER PRESENTED AT THE TWELFTH ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY, WASHINGTON, D. C., JUNE 18-22, 1967

A GAS-SOLID CHROMATOGRAPHIC METHOD WAS DEVELOPED TO MEASURE VERY LOW CONCENTRATIONS OF ENVIRONMENTAL TRITIUM. THE METHOD IS MORE SENSITIVE THAN LIQUID-SCINTILLATION COUNTING TECHNIQUES AND FASTER AND SIMPLER THAN EITHER ELECTROLYTIC OR THERMAL DIFFUSION METHODS. THE PALLADIUM-FILLED CHROMATOGRAPH OPERATES AT ROOM TEMPERATURE AND HAS A CAPACITY OF 50-ML WATER (70 L. H2 GAS). THE TIME REQUIRED FOR ANALYSIS OF A SAMPLE INCLUDING HYDROGEN GENERATION AND COUNTING IN A PROPORTIONAL COUNTER IS ABOUT 4 HR. THE LOWER LIMIT OF SENSITIVITY (50 ML SAMPLE AND A 30-MIN COUNT) IS LESS THAN 10 TRITIUM ATOMS PER 10-18 HYDROGEN ATOMS.

CHROMATOGRAPHY + HYDROGEN + *ANALYTICAL TECHNIQUE + SAVANNAH RIVER PLANT + GAS

023868
SELECTED CVTR OPERATING EXPERIENCE
CAROLINAS VIRGINIA NUCLEAR POWER ASSOCIATES, INC., PARR, S. C.
32 PAGES, MONTHLY OPERATING REPORT, OCTOBER 1966

(PG 20) - EVALUATED SENSITIVITY OF VARIOUS AIRBORNE-TRITIUM MONITORING INSTRUMENTS TO MIXTURES OF TRITIUM AND FISSION GASES IN CONTAINMENT FOLLOWING A FUEL FAILURE EARLY IN THE MONTH. XENON READ HIGHER BY A FACTOR OF 10 OVER THE ACTUAL CONCENTRATION. ACTUAL TRITIUM CONCENTRATION OF THE MIXTURE WAS ONLY 1/5TH THAT INDICATED. (PG 26) - ON STARTUP AFTER THE SECOND REFUELING, AFTER 1.5 HR AT 90% POWER, A FUEL FAILURE OCCURRED. TESTS THE REST OF THE MONTH SHOWED THIS WAS IN U-TUBE B3 (CONTAINING HIGH-POWER-DENSITY FUEL), AND THE LEAK REPRESENTED LESS THAN 1% FAILED FUEL, PROBABLY ONE ROD.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

CVTR (PWR) + *FAILURE, FUEL ELEMENT + REACTOR, HWR + REPORT, OPERATIONS + REACTOR, PRESSURE TUBE + REACTOR, PWR + *XENON + *MONITOR, AIR + *INSTRUMENT, ABNORMAL INDICATION

024192
ISTOMINA AG + SHTUKKENBERG YM
THE CONTROL OF THE CONTAMINATION OF SURFACES WITH TRITIUM OXIDES AND DEACTIVATION MEASURES
7 PAGES, MED. RADIOL. 12(7), PAGES 61-7 (JULY 1967) (IN RUSSIAN)

THE CONTAMINATION OF SIX MATERIALS BY TRITIUM OXIDES IS REPORTED. A METHOD IS PROPOSED FOR THE MEASUREMENT OF THE CONTAMINATION OF SURFACES, AND AN ASSESSMENT IS GIVEN OF DECONTAMINATION METHODS FOR SURFACES POLLUTED BY TRITIUM OXIDES.

*DECONTAMINATION + MEASUREMENT + OXIDE + *CONTAMINATION + RADIOCHEMICAL PLANT SAFETY + *RADIOISOTOPE + *FUEL REPROCESSING

024786
BOUTOT P + SCHIPFER P
DECONTAMINATION TESTS ON TRITIUM-CONTAMINATED MATERIALS
COMMISSARIAT A L ENERGIE ATOMIQUE, CHUSCLAN, FRANCE
CEA-R-3312 +. 18 PAGES, DECEMBER 1967, IN FRENCH

THESE TESTS ARE DESIGNED TO TRY OUT VARIOUS PROCESSES LIABLE TO BE APPLIED TO THE DECONTAMINATION OF A MATERIAL CONTAMINATED WITH TRITIUM. THE SAMPLES ARE THIN STAINLESS-STEEL SLABS CONTAMINATED IN THE LABORATORY WITH ELEMENTS EXTRACTED FROM INDUSTRIAL INSTALLATIONS. THE MEASUREMENT OF THE

024286 *CONTINUED*
INITIAL AND RESIDUAL ACTIVITIES IS CARRIED OUT USING AN OPEN-WINDOW BERTHOLD COUNTER. THE BEST RESULTS ARE OBTAINED BY PASSING A CURRENT OF PREHEATED (300 C) AIR CONTAINING WATER VAPOUR. THIS PROCESS MAKES IT POSSIBLE TO REACH A DECONTAMINATION FACTOR OF 99.5 % IN 4 HR. IN A VACUUM, THE OPERATION HAS TO BE PROLONGED TO 100 HR TO OBTAIN A DECONTAMINATION FACTOR OF 99.2%. WET-CHEMICAL OR ELECTROLYTIC TREATMENTS ARE EFFICIENT, BUT THEIR USE IS LIMITED BY CORROSION RISKS. A STUDY OF THE REAPPEARANCE OF THE CONTAMINATION MADE IT POSSIBLE TO OBSERVE THAT THIS PHENOMENON OCCURS WHATEVER THE PROCESS USED.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*DECONTAMINATION + TEST, BENCH

024591
LINDEKEN CL + SANTOMASSINO VC
TRITIUM-IN-AIR GENERATOR FOR DYNAMIC CALIBRATION OF TRITIUM MONITORS
LAWRENCE RADIATION LAB., UNIV. OF CALIF., LIVERMORE
UCRL-50007-67-2 +. 4 PAGES, PAGE 13 THROUGH 16 OF HAZARDS CONTROL PROGRESS REPORT NO. 28, 3 FIGURES, 2 TABLES, AUGUST 1967

PRESENTS A TECHNIQUE FOR GENERATING TRITIUM IN AIR. SIMPLE ENOUGH TO PERMIT ROUTINE INSTRUMENT CHECKS. THE GENERATOR USES TRITIATED ACETONE AS A SOURCE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, $3.00 COPY, $0.65 MICROFICHE

*INSTRUMENT CALIBRATION + TEST, INSTRUMENT RESPONSE

024740
OSBORNE RV
STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT CRNL
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER (ONTARIO). CHALK RIVER NUCLEAR LABS.
AECL-2699 + CONF-670218-2 +. 19 PAGES, 13 FIGURES, 7 REFERENCES, NOV. 1967, FROM SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL, ALBUQUERQUE, N. MEX.

IONIZATION CHAMBERS AND PLASTIC SCINTILLATION DETECTORS ARE USED TO MEASURE TRITIATED WATER (HTO) VAPOUR IN AIR DOWN TO 0.5 MICROCURIE/CU. METER. THEIR RESPONSES TO GAMMA BACKGROUND ARE REDUCED 98% BY SUBTRACTING THE IONIZATION CURRENT FROM A CONCENTRIC SEALED IONIZATION CHAMBER AND BY SCINTILLATION PULSE HEIGHT ANALYSIS. THE PENETRATION OF HTO THROUGH HUMAN SKIN HAS BEEN STUDIED EXPERIMENTALLY BY EXPOSING VOLUNTEERS TO HTO VAPOUR. RESPIRATORS WITH CHARCOAL FILTERS HAVE BEEN SHOWN TO HOLD UP PASSAGE OF HTO VAPOUR. AN AUTOMATIC URINALYSER ALLOWS WORKERS TO MEASURE THEIR OWN BODY BURDENS OF TRITIUM IN TWO MINUTES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

CANADA + *MONITOR, AIR + CHALK RIVER + *CONCENTRATION + MAN + RADIATION MONITORS

025597
HOLLAND JZ
PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE
U.S. ATOMIC ENERGY COMMISSION
15 PAGES, 12 FIGURES, 3 TABLES, 17 REFERENCES, PAGES 23-38, FROM COLLOQUE INTERNATIONAL SUR LA POLLUTION RADIOACTIVE DES MILIEUX GAZEUX (RADIOACTIVE POLLUTION OF GASEOUS MEDIA). BOOK I. SACLAY NOVEMBER 12-16, 1963

RADIONUCLIDES CAN BE INTRODUCED INTO THE UPPER TROPOSPHERE, STRATOSPHERE, MESOSPHERE, AND HIGHER LAYERS OF THE ATMOSPHERE BY BOTH PEACEFUL AND MILITARY USES OF NUCLEAR ENERGY. EXAMPLES OF PEACEFUL USES WHICH MIGHT RELEASE RADIOACTIVITY INTO THESE REGIONS ARE PROPULSION SYSTEMS AND AUXILIARY POWER SUPPLIES FOR OUTER-SPACE VEHICLES. THE PREDICTION AND THEREFORE CONTROL OF THE DISTRIBUTION AND FALLOUT OF SUCH CONTAMINANTS PRESENTS A NUMBER OF NOVEL SCIENTIFIC PROBLEMS. AN OUTLINE IS GIVEN OF THE USAEC COORDINATED PROGRAMS OF SAMPLING-DEVICE DEVELOPMENT, ANALYTICAL METHODS DEVELOPMENT, SAMPLE COLLECTION AND ANALYSIS, AND METEOROLOGICAL EVALUATION OF DATA.

AVAILABILITY - PRESSES UNIVERSITAIRES DE FRANCE, 108, BOULEVARD SAINT-GERMAIN, PARIS, VI, FRANCE

AEROSOL + CADMIUM + CARBON + CERIUM + CESIUM + ATMOSPHERIC DIFFUSION, CLIMATOLOGY + *ATMOSPHERIC DIFFUSION, GLOBAL + *FALLOUT + KRYPTON + ATMOSPHERIC STABILITY + SODIUM + *STRATOSPHERE + STRONTIUM + *SAMPLING + AIRCRAFT + COSMIC RADIATION + TUNGSTEN + *RADIOACTIVITY RELEASE + *MESOSPHERE + RHODIUM + *TROPOSPHERE + AGENCY, AEC

025984
JAMES, BT
THE INSTALLED TRITIUM MONITORING SYSTEM IN THE DIDO AND PLUTO REACTOR HALLS
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL (ENGLAND)
AERE-M-1929 +. 4 PAGES, 12 FIGURES, 4 REFERENCES, DECEMBER 1967

DESCRIBES NEW EQUIPMENT INSTALLED IN THE DIDO AND PLUTO REACTOR HALLS FOR THE MONITORING OF TRITIATED WATER IN AIR. EACH UNIT OF THE INSTALLATION IS PROVIDED WITH TWELVE REMOTE SAMPLING

025984 *CONTINUED*
POINTS, REMOTE INDICATION AND WARNING FACILITIES, AND THE SYSTEM IS FREE FROM INTERFERENCE FROM HIGH GAMMA RADIATION FIELDS. TWO STANDARD 1844A RADIOACTIVE GAS MONITORS ARE USED IN EACH UNIT, AND THE SYSTEM HAS PROVED ADEQUATE FOR ALL OPERATIONAL MONITORING REQUIREMENTS. REMOTE MONITORING IN THE EVENT OF EVACUATION FROM THE REACTOR BUILDINGS IS PROVIDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, $3.00 COPY, $0.65 MICROFICHE

REACTOR, TEST + *UNITED KINGDOM + *MONITOR, GAS + *PLUTO (TR) + *DIDO (TR) + HARWELL + EQUIPMENT DESIGN

026278
MCCONNON D
THE USE OF WATER AS A SAMPLING MEDIUM FOR TRITIUM OXIDE
BATTELLE-NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-CC-547 +. 13 PAGES, 1970

A SAMPLING TECHNIQUE FOR AIRBORNE TRITIUM OXIDE WAS DEVELOPED AND TESTED FOR AN 98 PERCENT. THE TECHNIQUE EMPLOYS A GAS WASH BOTTLE FILLED WITH ORDINARY DISTILLED WATER THROUGH WHICH AIR IS BUBBLED AT A CONSTANT FLOW RATE. THE METHOD IS RAPID, RELIABLE, AND SENSITIVE AND HAS BEEN PROVEN UNDER A VARIETY OF FIELD CONDITIONS. ADDITIONALLY, A TECHNIQUE IS DESCRIBED FOR DETERMINING THE AMOUNT OF TRITIUM OXIDE SURFACE CONTAMINATION. BECAUSE OF DIFFICULTIES IN MEASURING THE COLLECTION EFFICIENCY OF THE TECHNIQUE, IT IS PRESENTLY USED FOR QUALITATIVE MEASUREMENTS AS A TREND INDICATOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*OXIDE + *SURFACE CONTAMINATION + *WATER + *SAMPLING + AIR + *ANALYTICAL TECHNIQUE + CONCENTRATION

027925
A NEW FAMILY OF TRITIUM MONITORING EQUIPMENT OFFERING COMPLETE PERSONNEL PROTECTION
SANDIA CORPORATION
SC-M-68-245 +. 10 PAGES, MARCH 1968

DESCRIBES A COMPLETE TRITIUM MONITOR WHICH INCLUDES THE PRIMARY COMPONENTS OF A NEW CONTINUOUS MONITORING SYSTEM. THE COMPONENTS ARE A TRITIUM ALARM-MONITOR, RECORDER, RADIOLOGICAL URINALYSIS KIT, GAS-GENERATION CARTRIDGE, AND A TRITIUM-MONITORING CONSOLE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*MONITOR, PERSONNEL + *RADIATION SAFETY AND CONTROL + *RADIOLOGICAL ASSISTANCE + CONCENTRATION + MAN + RADIATION MONITORS

027976
MORRIS EC
REMOTE TRITIUM AIR MONITORING SYSTEM
SAVANNAH RIVER LABORATORY
DPSPU-67-30-1 + SR-95-50 + CONF-670705-7 +. 9 PAGES, REFERENCES, APRIL 1967, FROM IAEA SYMPOSIUM ON INSTRUMENTS AND TECHNIQUES FOR THE ASSESSMENT OF AIRBORNE RADIOACTIVITY IN NUCLEAR OPERATIONS, VIENNA, AUSTRIA

TRITIUM IS PRODUCED IN HEAVY-WATER-MODERATED REACTORS THROUGH NEUTRON CAPTURE BY DEUTERIUM. THE RATE OF TRITIUM PRODUCTION IS A FUNCTION OF NEUTRON FLUX AND IRRADIATION TIME. ANY TRITIUM OXIDE, SUBSEQUENTLY PRODUCED, IS RELEASED TO THE ATMOSPHERE READILY BY VAPORIZATION WHENEVER THE MODERATOR IS EXPOSED, FOR EXAMPLE ON THE SURFACES OF FUEL BEING DISCHARGED. THE ATTENDENT HEALTH HAZARD IS ONE OF TRITIUM ABSORPTION EITHER DIRECTLY THROUGH THE SKIN OR THROUGH THE RESPIRATORY SYSTEM. THIS HAZARD IS BEST CONTROLLED BY THOROUGHLY TRAINING PERSONNEL, ACCURATELY KNOWING THE CONDITIONS TO WHICH PERSONS ARE EXPOSED, AND PRESCRIBING PROPER PROTECTIVE CLOTHING. AT THE SAVANNAH RIVER PLANT, ALL THESE MEANS ARE USED TO PROVIDE EFFECTIVE CONTROL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*AIRBORNE RELEASE + *HEALTH PHYSICS TRAINING + *REACTOR, HWR + INHALATION + *MONITOR, ENVIRONMENTAL + SAVANNAH RIVER PLANT + VAPOR PRESSURE + RADIATION SAFETY AND CONTROL + SORPTION + RADIATION MONITORS

028116
PAYNE BR + THATCHER LL + CAMERON JF + FLORKOWSKI T
THE MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO METEOROLOGY AND HYDROLOGY. FINAL REPORT
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
IAEA-3162-1 +. 119 PAGES, MAY 1967

THE RESEARCH CONTRACT WAS IN EFFECT BETWEEN THE U.S. ATOMIC ENERGY COMMISSION AND THE AGENCY FROM 1 JANUARY 1963 TO 31 DECEMBER 1965. THE AIM OF THE PROJECT MAY BE DEFINED BROADLY AS THE DEVELOPMENT OF ROUTINE METHODS FOR THE ANALYSIS OF ENVIRONMENTAL LEVELS OF TRITIUM IN NATURAL WATERS, AND, THROUGH THE JOINT PROGRAMME OF PRECIPITATION SAMPLING THROUGHOUT THE WORLD CARRIED OUT BY THE AGENCY IN COLLABORATION WITH WMO, THE PROVISION OF AN OVERALL PICTURE OF THE GLOBAL

028116 *CONTINUED*
OCCURRENCE OF TRITIUM IN PRECIPITATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

HYDROGEN + IAEA + OXYGEN + STRATOSPHERE + *WATER + *PRECIPITATION + METEOROLOGY + *MONITORING PROGRAM, ENVIRONMENTAL

028723
VALENTINE AM
AN INVESTIGATION OF A BUBBLER TRITIUM SAMPLER
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-3916 +. 11 PAGES, 5 FIGURES, 6 TABLES, 3 REFERENCES, APRIL 1968

INVESTIGATION OF A BUBBLER TRITIUM SAMPLER INDICATED COLLECTION CHARACTERISTICS SIMILAR TO REPORTED HUMAN BODY UPTAKE RATES FOR TRITIUM GAS AND TRITIATED WATER VAPOR. THE BUBBLER COLLECTOR CONSISTED OF A DRY GAS WASH BOTTLE WITH A FRITTED GLASS TIP ON THE INLET AND DISTILLED WATER AS THE COLLECTING MEDIUM. TESTS WERE MADE UNDER BOTH LABORATORY AND FIELD CONDITIONS, AND THE EFFECTS OF VARYING THE FLOW RATE, WATER VOLUME, AND WATER TEMPERATURE WERE DETERMINED. A FLOW-THROUGH IONIZATION CHAMBER INSTRUMENT WAS USED TO MEASURE THE TRITIUM CONCENTRATIONS SAMPLED, AND THE COLLECTED TRITIUM WAS DETERMINED BY LIQUID SCINTILLATION COUNTING. THIS COLLECTOR CAN SELECTIVELY SAMPLE TRITIATED WATER VAPOR IN THE PRESENCE OF TRITIUM GAS, AND ALLOWS THE HEALTH PHYSICIST TO MAKE A BETTER ASSESSMENT OF TRITIATED WATER VAPOR CONCENTRATIONS IN AIR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA 22151, $3.00 COPY, $0.65 MICROFICHE

COUNTER + CHAMBER, ION + *SAMPLING + AIR + *ANALYTICAL TECHNIQUE + RADIOLYTIC GAS + BUBBLE + GAS + FILTERS

029220
MAUSHART R
ACCURACY OF METHODS AND INTERPRETATION OF RESULTS OF H-3 MONITORING
KARLSRUHE NUCLEAR RESEARCH CENTRE, GERMANY
CONF-670621 +. 17 PAGES, PP. 541-557 OF RADIATION DOSE MEASUREMENTS. THEIR PURPOSE, INTERPRETATION, AND REQUIRED ACCURACY IN RADIOLOGICAL PROTECTION, PARIS, EUROPEAN NUCLEAR ENERGY AGENCY, 1967

TRITIUM IN THE HUMAN BODY CAN BE ASSESSED WITH A HIGH DEGREE OF ACCURACY BY MEASUREMENTS OF TRITIUM EXCRETED IN URINE IF THE MEASUREMENTS ARE NOT LONGER THAN SOME WEEKS AFTER THE INITIAL INTAKE AND IF THE MEASUREMENTS ARE REPEATED SUFFICIENTLY SO THAT THE HALF-TIME OF EXCRETION WILL BE KNOWN. LATER MEASUREMENTS HAVE TO TAKE INTO ACCOUNT THAT THE FRACTION OF TOTAL-BODY TRITIUM CONTAINED IN THE BODY WATER DECREASES WITH TIME.

*MONITOR, PERSONNEL + *AIR + *ANALYTICAL TECHNIQUE + *DOSE MEASUREMENT, INTERNAL + *CONCENTRATION + EXCRETION, URINE + MAN

030129
JACOBS DG
SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
TID-24635 + ORNL-NSIC-39 +. 90P., DEC. 1968

AN ATTEMPT IS MADE IN THIS STATE-OF-THE-ART-REPORT TO SUMMARIZE SOME OF THE IMPORTANT PROPERTIES OF TRITIUM AND TO USE THESE PROPERTIES IN PREDICTING THE IMPACT OF DIVERSE RELEASES OF TRITIUM ON LOCAL AND WORLDWIDE POPULATIONS. DESPITE INADEQUACIES OF PRESENT INFORMATION ON THE BEHAVIOR OF TRITIUM, WE CAN CONCLUDE, IN OUR PRESENT POWER ECONOMY, TRITIUM POSES NO SEVERE WORLDWIDE EXPOSURE PROBLEMS. HOWEVER, IT WILL CONTINUE TO OFFER HANDLING AND ENVIRONMENTAL CONTAMINATION PROBLEMS. ALSO REPORTED IS INFORMATION CONCERNING SOURCES, ENRICHMENT, MONITORING, MOVEMENT, AND PROJECTED PRODUCTION OF TRITIUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

DEPOSITION + DIFFUSION + DILUTION + CHROMATOGRAPHY + GROUND WATER + OCEAN AND SEA + RAINOUT + STRATOSPHERE + SURFACE CONTAMINATION + CONDENSATION + REACTOR, POWER + THERMAL CONSIDERATION + POPULATION EXPOSURE + EVAPORATION + HYDROLOGY + RADIATION SAFETY AND CONTROL + DISPERSION + RADIOACTIVITY RELEASE + ENVIRONMENT + TROPOSPHERE + FUEL REPROCESSING + RADIATION MONITORS + JACOBS

030136
SMITH CF
GAS ANALYSIS RESULTS FOR PROJECT RULISON PRODUCTION TESTING SAMPLES
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-51153 + PNE-R-58 +. 27 PAGES, 10 FIGURES, 10 TABLES, 8 REFERENCES, NOVEMBER 1971

RESULTS OBTAINED BY CHEMICAL AND RADIOCHEMICAL GAS ANALYSIS OF SAMPLES TAKEN FROM THE FLOWING GAS STREAM DURING THE PROJECT RULISON NUCLEAR GAS STIMULATION EXPERIMENT ARE PRESENTED AND DISCUSSED. THESE RESULTS COVER THE PRODUCTION TESTING PERIOD FROM OCTOBER 26, 1970 THROUGH APRIL 23, 1971, WHEN NEARLY 420 MILLION FT-3 OF GAS WERE FLARED IN THREE TESTING PERIODS.

030136 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON + *KRYPTON + *PLOWSHARE + TESTING + *SAMPLING + *ANALYTICAL TECHNIQUE + *RADIOCHEMICAL ANALYSIS + EXPERIMENT + *GAS + RESOURCE, NATURAL + *BENEFICIAL USE

030394
PAIX D
BACKGROUND RATES IN TRITIUM COUNTING - THE EFFECT OF THE VIAL
PRINCE HENRY HOSPITAL, LITTLE BAY, AUSTRALIA
3 PAGES, INT. J. APPL. RADIAT. ISOTOP., 19, PAGES 162-164 (FEB. 1968)

WHEN SPECIMENS ARE ASSAYED BY LIQUID SCINTILLATION COUNTING, THE RADIOACTIVITY OF THE VIAL MAY CONTRIBUTE SIGNIFICANTLY TO THE BACKGROUND COUNT-RATE. THIS CONTRIBUTION MAY VARY MARKEDLY BETWEEN VIALS OF DIFFERING TYPE, OR EVEN BETWEEN VIALS FROM A SUPPOSEDLY UNIFORM SUPPLY. THESE EFFECTS LIMIT THE PRECISION WITH WHICH THE NET COUNT-RATES CAN BE ESTABLISHED WHEN (AS IS USUAL) A SINGLE BLANK IS MADE TO SERVE AS BACKGROUND FOR A NUMBER OF SAMPLES. THE EFFECT IN A COUNTER SET TO A TRITIUM CHANNEL WAS INVESTIGATED BY COUNTING A LARGE NUMBER OF SPECIMENS CONSISTING OF 10 +- 0.1 ML OF BRAYS MIXTURE IN GLASS AND POLYTHENE VIALS. EACH WAS COUNTED FOR 30 MIN (EXCEPT WHERE OTHERWISE STATED). THREE TYPES OF POLYTHENE AND GLASS VIALS WERE EXAMINED. WIDE VARIATIONS WERE FOUND.

COUNTER + *ANALYTICAL TECHNIQUE + SPECTROMETRY, GAMMA + CALIBRATION

030464
PRINCE JR + WANG CH
A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA EMITTERS
OREGON STATE UNIVERSITY, CORVALLIS
CONF-555 +. 5 PAGES, PAGES 179-83 OF SURFACE CONTAMINATION, NEW YORK PERGAMON PRESS 1967, FROM INTERNATIONAL SYMPOSIUM ON SURFACE CONTAMINATION, GATLINBURG, TENN. JUNE 1964

THE TECHNIQUE OF LIQUID SCINTILLATION COUNTING WAS APPLIED TO EVALUATION OF SWIPES FROM SURFACES CONTAMINATED WITH SOFT BETA EMITTERS. THE COUNTING EFFICIENCY OF A NUMBER OF COMPOUNDS CONTAINING C-14 OR H-3 WAS DETERMINED. RESULTS ARE PRESENTED IN TABULAR FORM. IN VIEW OF THE SIMPLICITY OF THE METHOD AND ITS SUITABILITY FOR RAPID EVALUATION OF LARGE NUMBERS OF SAMPLES, IT CAN ˜ RECOMMENDED FOR A VARIETY OF APPLICATIONS.

CARBON + *SURFACE CONTAMINATION + *BETA EMITTER + *SAMPLING + RADIOCHEMICAL ANALYSIS

030689
LEBOULEUX P + ARDELLIER A + VALERO S
DETECTION OF THE CONTAMINATION OF AIR BY TRITIATED WATER VAPOUR AROUND THE REACTOR EL 3
CENTRE D ETUDES NUCLEAIRES DE SACLAY, FRANCE
CEA-R-3617 +. SEPT. 1968, 43P.

DESCRIBES APPARATUS USED FOR THE DETECTION OF TRITIATED WATER VAPOUR CONTAMINATION IN AIR AROUND REACTOR EL 3. APPARATUS CONSISTS OF TWO AIR-CIRCULATION IONISATION CHAMBERS. THE AIR IN ONE OF THESE IS DRIED BY PASSAGE THROUGH A SILICA-GEL COLUMN. BY CARRYING OUT A DIFFERENTIAL MEASUREMENT OF THE IONIZATION CURRENTS, IT IS POSSIBLE TO MEASURE THE TRITIATED WATER VAPOUR CONCENTRATION. A THEORETICAL STUDY OF THE RESPONSE OF THE CHAMBERS IS CARRIED OUT FOR TWO TYPES OF EMISSION OF THE TRITIATED WATER VAPOUR - CONTINUOUS, OR IN BURSTS.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

ACTIVITY BUILDUP + *MONITOR, AIR + *ANALYTICAL TECHNIQUE + THEORETICAL INVESTIGATION + *WATER VAPOR + CALIBRATION + RADIATION MONITORS

031396
MAUSHART R
TRITIUM MEASUREMENTS IN RADIATION PROTECTION
KERNFORSCHUNGSZENTRUM, KARLSRUHE, GERMANY
7 PAGES, FACHZ. LAB., NO. 9, PAGES 845-52 (SEPT. 1967), IN GERMAN

TRITIUM, APART FROM THE MULTICURIE SOURCES USED IN RADIATION TECHNIQUE, IS THE MOST FREQUENTLY USED RADIOISOTOPE. DUE TO ITS LOW ENERGY (MAXIMUM ENERGY EQUALS 18 KEV), IT DEMONSTRATES SUBSTANTIAL PROBLEMS OF MEASURING TECHNIQUE. TRITIUM IS INCORPORATED AS WATER VAPOR AND WILL SHOW IN AN EXTREMELY SHORT INTERVAL IN THE BLOOD. THIS IS ONE MORE REASON WHY ITS IMPORTANCE IN RADIATION PROTECTION SHOULD NOT BE UNDERESTIMATED. APART FROM SOME SPECIFIC PROPERTIES OF TRITIUM, THE PAPER DISCUSSES SPECIAL MEASURING PROCEDURES, COMPARING THEM TO THEIR SPECIFIC APTITUDES.

*MEASUREMENT + *POPULATION EXPOSURE + RADIATION PROTECTION, ORGANIZATION + GERMANY + RADIOISOTOPE + *CONCENTRATION + MAN

031431
STUSSI H
INSTRUMENTS FOR MONITORING LIQUID AND GASEOUS MEDIA

031431 *CONTINUED*
SOCIETE LANDIS ET GYR, ZOUG, SWITZERLAND
CONF-651220 +. 5 PAGES, PAGES 73-7 OF CONGRES INTERNATIONAL SUR LA RADIOPROTECTION DANS L UTILISATION INDUSTRIELLE DES RADIOELEMENTS, PARIS, 13-15 DECEMBER 1965. PARIS, SERVICE CENTRA DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, 1967

THE PROBLEMS INVOLVED IN THE MEASUREMENT OF RADIOACTIVITY IN LIQUIDS AND GASES ARE DISCUSSED, AND THE SENSITIVITIES NECESSARY FOR MONITORING DEVICES ARE DERIVED FROM DIRECTIVES OF THE ICRP CONCERNING THE MAXIMUM CONCENTRATIONS OF RADIOISOTOPES. SOME SOLUTIONS OF THESE PROBLEMS ARE PRESENTED, AND ILLUSTRATED BY RESULTS OF MEASUREMENTS IN AIR AND WATER. METHODS FOR THE INCREASE OF DETECTOR SENSITIVITY ARE DISCUSSED AND METHODS OF SAMPLE PREPARATION, INCLUDING MECHANICAL SEPARATION OF AEROSOLS, ABSORPTION OF AEROSOLS BY ACTIVATED CHARCOAL, AND CONCENTRATION OF AQUEOUS SOLUTIONS BY EVAPORATION ARE DESCRIBED. THE METHODS USED TO MEASURE I-131 CONTENT OF ATMOSPHERE AND TRITIUM CONTENT OF WATER ARE DESCRIBED.

FRANCE + *IODINE + MPC + *MEASUREMENT + *MONITOR, LIQUID + *WATER + *MONITOR, GAS + AIR + CHARCOAL + AEROSOL, RADIOACTIVE + EVAPORATION + ICRP + SORPTION + RADIOISOTOPE + RADIATION MONITORS

033384
GABAY JJ + SAX NI
SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MAPPING WITH TRITIUM
RADIOLOGICAL SCIENCES LAB., ALBANY
5 PAGES, ENVIRON. RES., 2, PAGES 72-6 (SEPT. 1968)

A TECHNIQUE FOR WIDE-AREA STACK EFFLUENT DISPERSION MAPPING IS DESCRIBED USING TRITIATED WATER AS A TRACER. THE SAMPLER CONSISTS OF INDICATING SILICA-GEL IN A FIBER-GLASS-SCREEN BAG CONVENIENTLY PLACED IN THE FIELD ALONG SAMPLING LEGS RADIATING OUT FROM THE SOURCE. THE ADSORBED WATER VAPOR IS REMOVED FROM THE SILICA GEL BY VACUUM DISTILLATION AND THE TRITIUM CONTENT DETERMINED BY LIQUID SCINTILLATION COUNTING. THIS TECHNIQUE HAS BEEN USED SUCCESSFULLY TO DISTANCES 10 MILES FROM A SOURCE TO EXPERIMENTALLY DETERMINE THE C-SUBMAX OF A STACK EFFLUENT FROM A NUCLEAR FUELS REPROCESSING PLANT WHICH ALREADY CONTAINED SOME TRITIATED WATER.

*EFFLUENT + TRACER, RADIOACTIVE + *STACK + *DISPERSION + OFF GAS + WATER VAPOR + OFF SITE

036224
WATERS JR + PETROFF C + KOSKI WS
A PROPANE BUBBLE CHAMBER AS A LOW LEVEL COUNTER FOR TRITIUM AND CARBON-14
JOHNSTON LABORATORIES, INC., BALTIMORE, MARYLAND
7 PAGES, 8 FIGURES, 5 REFERENCES, IEEE TRANSACTIONS ON NUCLEAR SCIENCE, NS-16(1), PAGES 309-404 (FEBRUARY 1969)

A BUBBLE CHAMBER HAS BEEN OPERATED AS A COUNTER WITH THE PROPANE FILLING BEING HIGHLY SUPERHEATED SO THAT IT IS SENSITIVE TO THE LOW ENERGY (AVERAGE 6 KEV) ELECTRONS EMITTED IN TRITIUM BETA DECAY. EXPERIMENTAL TECHNIQUES ARE DESCRIBED USING QUARTZ CHAMBERS OF 10 ML VOLUME OPERATED AT 55 C. THREE PLATEAUS ARE OBSERVED IN A PLOT OF THE CHAMBER COUNTING RATE AGAINST THE SUPERHEAT PRESSURE (SUPERHEAT PRESSURE EQUALS VAPOR PRESSURE AT 55 C MINUS EXPANSION PRESSURE). THESE WERE DUE TO ALPHA PARTICLES (30-40 PSI) RECOIL PROTONS (50-90 PSI) AND ELECTRONS (140-220 PSI). THE CHAMBER BACKGROUND COUNTING RATE WAS STABLE AND REPRODUCIBLE FOR LONG TIMES.

AVAILABILITY - J.P. WATERS, JOHNSTON LABORATORIES, INC., 3617 WOODLAND AVENUE, BALTIMORE, MARYLAND 21215

CARBON + CHAMBER + COUNTER + DESIGN STUDY + BUBBLE + RADIATION MONITORS

036537
PORTER NS + SPEAR WG
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION
BATTELLE NORTHWEST, RICHLAND, WASHINGTON
BNWL-1051(PT. 3) +. 48 PAGES, 3 FIGURES, 1 TABLE, JULY 1969

DISCUSSES INSTRUMENTS USED IN VARIOUS MONITORING METHODS AND TECHNIQUES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*BIOMEDICAL + COUNTER + SOLID STATE DEVICE + RADON + RADIATION SAFETY AND CONTROL + BATTELLE NORTHWEST + *RADIOBIOLOGY + INSTRUMENTS, MISC.

036925
JOHNS TF
MONITORING OF GASEOUS EFFLUENTS FROM REACTORS
ATOMIC ENERGY ESTABLISHMENT, WINFRITH (ENGLAND)
AEEW-M-891 +. 10 PAGES, TABLES, 2 REFERENCES, APRIL 1969

TECHNIQUES DEVELOPED AND USED AT THE ATOMIC ENERGY ESTABLISHMENT, WINFRITH, FOR MONITORING DISCHARGES OF INERT GASES FROM REACTOR SYSTEMS ARE DESCRIBED, AS WELL AS TECHNIQUES USED FOR CONTINUOUSLY MONITORING FOR SMALL (MILLICURIE) RELEASES OF IODINE_131 IN THE PRESENCE OF MUCH LARGER QUANTITIES (HUNDREDS OF CURIES) OF INERT GASES. DIFFICULTIES EXPERIENCED IN THE USE OF THESE MONITORS ARE ALSO DISCUSSED, AND BRIEF MENTION IS MADE OF THE TECHNIQUE USED FOR MEASURING RELEASES OF TRITIATED WATER VAPOR.

036925 *CONTINUED*
AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

EFFLUENT + IODINE + *MONITOR, STACK + *NOBLE GAS + UNITED KINGDOM + INSTRUMENT, AIR SAMPLING + *MONITOR, GAS + WASTE DISPOSAL, GAS

037365
MULLINS JW + ANDREWS VE + DUNN LM
TECHNIQUES FOR MONITORING AND ANALYSIS OF ENVIRONMENTAL TRITIUM
WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS, NEVADA
4 PAGES, 2 TABLES, 9 REFERENCES, IEEE TRANSACTIONS ON NUCLEAR SCIENCE, 19(1), PP. 177-180 (FEBRUARY 1972)

ROUTINE SAMPLING TECHNIQUES ARE ACCEPTABLE FOR ENVIRONMENTAL TRITIUM, ALTHOUGH ATTENTION MUST BE PAID TO THE CHEMICAL AND PHYSICAL STATE OF THE TRITIUM. LIQUID SCINTILLATION AND GAS COUNTING METHODS ARE BOTH ACCEPTABLE FOR COUNTING TRITIUM, WITH GAS COUNTING BEING THE MOST SENSITIVE. SENSITIVITIES FOR TRITIUM CAN BE INCREASED GREATLY BY ELECTROLYTIC ENRICHMENT BEFORE COUNTING.

*COUNTER + *INSTRUMENT, AIR SAMPLING + MONITOR, AIR + *SAMPLING + AIR + AIRCRAFT + *ANALYTICAL TECHNIQUE + ENVIRONMENT + *CONCENTRATION

037755
BLOCK S + BARLOW DH + DIXON JE + HODGKINS DJ
A TRITIUM PROPORTIONAL COUNTER WITH GAMMA COMPENSATION
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
UCRL-50007-69-1 + 5 PG, 4 FIGURES, 1 TABLE, REFERENCES, APRIL 1969

A LARGE AREA, THIN WINDOW, GAS PROPORTIONAL COUNTER DESIGNED AS A TRITIUM MONITOR IS BEING FIELD TESTED AS A PROTOTYPE SYSTEM. A TWOFOLD GAIN IN SENSITIVITY FOR 1 MPC OF HTO (5 MICROCURIES/M3) AND A DECREASE IN BACKGROUND HAS BEEN ACHIEVED. THE INSTRUMENT WILL INDICATE AND RECORD THE COUNT RATE CORRESPONDING DIRECTLY TO THE TRITIUM AIR CONCENTRATION (EITHER AS HTO OR H-3), EVEN IF THE AREA BACKGROUND CHANGES UP TO 5 MR/HR IN A UNIFORM RADIATION FIELD. THE ELECTRONICS CIRCUITRY AND OPERATIONAL CHARACTERISTICS ARE DESCRIBED.

CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $.300 COPY, $0.65 MICROFICHE

COUNTER + *BETA EMITTER + *MONITOR, AIR + INSTRUMENT, COMPONENT + TEST, INSTRUMENT RESPONSE + EQUIPMENT DESIGN + RADIATION MONITORS

037759
PREVO CT + SANTOMASSIMO VC
THE DETECTION OF TRITIATED WATER USING A PLASTIC-SCINTILLATOR FLOW CELL
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
UCRL-50007-69-1 + 5 PG, 5 FIGURES, 1 TABLE, REFERENCES, APRIL 1969

IN A PREVIOUS UCRL REPORT, IS DESCRIBED A SYSTEM FOR THE DETECTION OF TRITIUM AND KRYPTON IN NATURAL GAS. THE SENSITIVITY OF THE SYSTEM FOR TRITIUM IS NOT SATISFACTORY FOR CONCENTRATIONS BELOW 0.0001 MICROCURIE/CC. THIS IS DUE TO THE INTERFERENCE FROM THE 670-KEV BETA FROM KR-85. A TECHNIQUE WHICH CAN REMOVE THIS INTERFERENCE INVOLVES BURNING THE METHANE AND COUNTING THE WATER WHICH IS FORMED. THE TRITIATED METHANE IS CONVERTED TO TRITIATED WATER, WHICH SHOULD BE FREE OF KRYPTON. THIS REPORT DESCRIBES THE RESULTS OF THE PRELIMINARY INVESTIGATOR OF A PLASTIC-SCINTILLATOR FLOW CELL WHICH CAN BE USED TO COUNT THE TRITIATED WATER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

COUNTER + KRYPTON + MONITOR, GAS + *ANALYTICAL TECHNIQUE + INSTRUMENT, COMPONENT + *INSTRUMENT, FLOW + TEST, INSTRUMENT RESPONSE + RADIATION MONITORS

038591
KANG Y
STUDY ON THE VARIATION OF TRITIUM AND C-14 CONCENTRATIONS IN THE ENVIRONMENT
KYUNGPOOK NATIONAL UNIVERSITY, TAIKU, KOREA
10 PAGES, NEW PHYSICIAN (KOREA), VOLUME 8, PAGES 1-10 (JUNE 1968)(IN KOREAN)

A STUDY WAS MADE ON THE VARIATION OF TRITIUM AND C-14 CONCENTRATION IN THE ENVIRONMENT EMPLOYING GAS COUNTING AND THE LIQUID SCINTILLATION COUNTING METHODS. THROUGH THE EXPERIMENT IT WAS FOUND THAT THE FIGURE OF MERIT OF THE NEW SCINTILLATION SOLVENT FOR THE TRITIUM CONCENTRATION MEASUREMENT WAS 193 AND THE MINIMUM DETECTABLE CONCENTRATION WAS 152 +- 3.6 T.U.

*CARBON + COUNTER + *MEASUREMENT + *JAPAN + ENVIRONMENT + TROPOSPHERE + GAS + LIQUID + *CONCENTRATION + FOOD

040000
OTLET RL
LOW-LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL APPLICATIONS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WANTAGE, ENGLAND

040000 *CONTINUED*
CONF-680939 +. 8 PAGES, PP. 10-17 OF NUCLEONIC INSTRUMENTATION, LONDON, INSTITUTION OF ELECTRICAL ENGINEERS, 1968, FROM CONFERENCE ON NUCLEONIC INSTRUMENTATION, READING, ENGLAND

TRITIUM MEASUREMENTS CAN MAKE A SIGNIFICANT CONTRIBUTION TO MANY STANDARD GEOLOGICAL INVESTIGATIONS ON GROUNDWATER ORIGINS, MOVEMENT AND POTENTIALITIES. A LABORATORY HAS BEEN SET UP AT W.R.L. FOR TRITIUM MEASUREMENTS IN SAMPLES OF NATURAL WATER. THE PRINCIPLES AND TECHNICQUES CURRENTLY USED AT W.R.L. FOR THESE MEASUREMENTS ARE DESCRIBED.

AVAILABILITY - R.L. OTLET, UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WANTAGE, ENGLAND

GEOLOGY + *GROUND WATER + *MEASUREMENT + *ANALYTICAL TECHNIQUE + HYDROLOGY

040792
LEBOUTON AV
LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS
UNIVERSITY OF CALIFORNIA, LOS ANGELES
3 PAGES, ANALYTICAL BIOCHEMISTRY, VOL. 26, PAGES 445-7 (DECEMBER 1968)

A METHOD IS DESCRIBED FOR DETERMINING RADIOACTIVITY IN TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS. THE PROTEIN IS FIRST LIBERATED FROM THE GEL BY DISSOLVING THE GEL WITH 30 PERCENT HYDROGEN PEROXIDE. THE FREE PROTEIN IS THEN BROUGHT INTO INTIMATE CONTACT WITH THE SCINTILLATION SOLVENT BY MEANS OF A NEW SOLUBILIZING AGENT. LIQUID SCINTILLATION SPECTROMETRY IS USED TO COUNT THE SAMPLES AND ALL STEPS ARE DONE IN SCINTILLATION VIALS UNDER CONDITIONS CONSIDERED OPTIMAL FOR NO LOSS OF TRITIUM RADIOACTIVITY. THE RESULTS OF DETERMINING RADIOACTIVITY IN INCREASING AMOUNTS OF ALBUMIN-H3 ARE TABULATED. IT WAS FOUND THAT AS THE AMOUNT OF SERUM IS INCREASED THERE IS A CORRESPONDING INCREASE IN THE NET ACTIVITY OF THE SERUM ALBUMIN

ANALYTICAL TECHNIQUE + SPECTROMETRY, BETA + EQUIPMENT DESIGN + LIQUID + PROTEIN

040479
HAZARDS CONTROL PROGRESS REPORT NO. 34, MAY-AUGUST 1969
CALIFORNIA UNIVERSITY, LIVERMORE, LAWRENCE RADIATION LABORATORY
UCRL-50007-69-2 +. 62 PAGES, 46 FIGURES, 7 TABLES, 24 REFERENCES, AUGUST 1969

TOPICS DISCUSSED - (1) THERMOLUMINESCENCE-DOSIMETRY PERSONNEL MONITORING SYSTEM, BADGE CHARACTERISTICS, LABELING, AND BADGE CHANGING, (2) DEVELOPMENT OF AN AUTOMATIC BADGE READER, (3) ELECTRONICS OF THE BADGE READER, (4) A SEWAGE-MONITORING SYSTEM, (5) A BIOASSAY TECHNIQUE FOR TRITIUM IN URINE, (6) A METHOD FOR DETERMINING POSITION OF A SODIUM IODIDE CRYSTAL IN THE DETECTOR CAN, AND (7) DETERMINATION OF NEUTRON SCATTERING IN THE LOW-SCATTER CELL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*MONITOR, LIQUID + *MONITOR, PERSONNEL + *WASTE DISPOSAL + PERSONNEL EXPOSURE, RADIATION + NEUTRON INTERACTION + MONITORING SYSTEM, RADIATION + CONCENTRATION + RADIATION MONITORS

040773
MURAKAMI K + MORITA I + MAEKAWA S
SAMPLE COMBUSTION APPARATUS FOR LIQUID SCINTILLATION COUNTING
KOBE INDUSTRIES, CORP. JAPAN
6 PAGES, RADIOISOTOPES (TOKYO), VOLUME 15, PAGES 254-9 (1966) (IN JAPANESE)

PREPARATION OF SAMPLES FOR LIQUID SCINTILLATION COUNTING BY THE COMBUSTION METHOD WAS STUDIED. DIFFERENT KINDS OF BIOLOGICAL SAMPLES SUCH AS PLANT AND ANIMAL TISSUES ARE USED IN STUDIES USING LIQUID SCINTILLATION COUNTING. IN THIS METHOD, AN H(3) -OR C(14)-LABELED SAMPLE IS PLACED IN AN OXYGEN FILLED FLASK, AND CONVERTED TO THO OR C(14)O2. COMBUSTION CONDITIONS FOR SEVERAL SAMPLES AND COLLECTION METHODS FOR H2O AND CO? WERE INVESTIGATED. A CIRCULAR FLOW COLLECTION METHOD WAS APPLIED TO THE COLLECTION, AND COLLECTION EFFICIENCIES OF MORE THAN 95 AND 98 PERCENT WERE OBTAINED FOR H2O AND CO2, RESPECTIVELY. AS A RESULT OF THESE EXPERIMENTAL RESULTS, A SAMPLE COMBUSTION APPARATUS WAS CONSTRUCTED AS A COMMERCIAL PRODUCT.

CARBON + COUNTER + ANALYTICAL TECHNIQUE + COMBUSTION + EQUIPMENT DESIGN + LIQUID + CONSUMER PRODUCT

040774
RAGLAND JB
COMBUSTION SAMPLES FOR LIQUID SCINTILLATION COUNTING
UNIVERSITY OF TENNESSEE, MEMPHIS
11 PAGES, NUCLEUS (CHICAGO), NO. 20, PAGES 1-11 (JANUARY 1966)

THE CONVENTIONAL COMBUSTION METHODS, WET, SEALED-TUBE, OXYGEN-TRAIN, OXYGEN BOMB, AND OXYGEN FLASK ARE ALL DISCUSSED FROM THE STANDPOINT OF USE FOR COMBUSTION OF BIOLOGICAL SAMPLES CONTAINING C-14, TRITIUM, S-35, OR P-3? FOR DETERMINATION BY LIQUID SCINTILLATION COUNTING. THE METHODS ARE ALSO SUITABLE FOR DOUBLE-LABELED SAMPLES WITH TWO BETA EMITTING ISOTOPES. IN SOME CASES, THE COMBUSTION PRODUCTS CONTAINING THE ISOTOPES CAN BE SEPARATED AND COUNTED INDIVIDUALLY- WHILE FOR OTHER MIXTURES THEY ARE BEST COUNTED COMBINED, COUNTED AGAIN AFTER SEPARATION OF ONE COMPONENT TO BE DETERMINED, AND THE SECOND EMITTER DETERMINED BY DIFFERENCE

CARBON + COUNTER + PHOSPHORUS + SULFUR + ANALYTICAL TECHNIQUE + EQUIPMENT DESIGN

041898
BERSAQUES DE
COUNTING OF TRITIATED COMPOUNDS ON PAPER CHROMATOGRAMS
UNIVERSITY OF GHENT
4 PAGES, INTERNATIONAL JOURNAL OF APPLIED RADIATION AND ISOTOPES, VOL. 19, PAGES 166-9 (FEBRUARY 1968)

FACTORS THAT MUST BE CONSIDERED IN THE SELECTION OF COUNTING METHODS FOR LABELED SUBSTANCES ON PAPER CHROMATOGRAMS ARE BRIEFLY REVIEWED. SOME RESULTS ARE TABULATED FOR THE COUNTING EFFICIENCY FOR ADENOSINE-H(3) ON FILTER PAPER USING VARIOUS SCINTILLATORS - ALSO FOR TOLUENE-H(3) AND WATER-H(3), INCLUDING QUENCHING DUE TO THE PAPER.

*ANALYTICAL TECHNIQUE + *DOSE MEASUREMENT, EXTERNAL + COMPARISON

041955
KROH J + PLONKA AM
RADIATION-INDUCED H-T EXCHANGE IN AROMATIC HYDROCARBONS SATURATED WITH TRITIATED WATER
TECHNICAL UNIVERSITY, POLAND
4 PAGES, BULLETIN POLSKA AKADEMIYA NAUK WARSAW. SERIES DES SCIENCES CHIMIQUES, VOL. 14, PAGES 331-4 (1966)

THE RESULTS OF GAMMA RADIOLYSIS OF BENZENE AND TOLUENE, SATURATED WITH TRITIATED WATER, WERE EXAMINED. NO H-T EXCHANGE OCCURRED WHEN UNIRRADIATED SAMPLES OF BENZENE OR TOLUENE SATURATED WITH TRITIATED WATER WERE STORED FOR ANY LENGTH OF TIME. THE ACTIVITIES OF THE IRRADIATED SAMPLES WERE PROPORTIONAL TO THE ABSORBED DOSE OF GAMMA RADIATION AND INCREASED WITH THE ACTIVITY OF THE TRITIATED WATER USED FOR SATURATION. THE DEGREE OF EXCHANGE, DEFINED AS THE RATIO OF THE FINAL SPECIFIC ACTIVITY OF BENZENE OR TOLUENE TO THE INITIAL SPECIFIC ACTIVITY OF THE RESPECTIVE SOLUTIONS PREPARED FOR IRRADIATION, WAS FOUND TO BE INDEPENDENT OF THE ACTIVITY OF THE TRITIATED WATER. THE EXCHANGE WAS MORE EFFICIENT FOR BENZENE THAN TOLUENE.

WATER + GAMMA EMITTER + SPECTROMETRY, BETA + COMPARISON

042769
COSTES C + FERRON F + ASSCHE J + DEROCHE M
STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY
CENTRE NATIONAL DE RECHERCHES AGRONOMIQUES, FRANCE
13 PAGES, ANNALES DE PHYSIOLOGIE VEGETALE, VOL. 6, PG 303-15 (1964)(IN FRENCH)

REVIEWS THE USE OF H-3 AND O(18)-LABELED WATER FOR STUDY OF PLANT METABOLISM. IN ADDITION TO A SURVEY OF EXPERIMENTAL RESULTS, TECHNIQUES FOR COUNTING TRITIUM IN BIOLOGICAL SYSTEMS ARE DESCRIBED, INCLUDING USE OF GAS COUNTERS AND SCINTILLATION COUNTERS, CHARACTERISTICS OF VARIOUS SCINTILLATORS, MEASUREMENT PROCEDURES FOR H-3, SIMULTANEOUS COUNTING OF H-3 AND C-14, AND THE EFFECT OF EXTINCTION.

BIBLIOGRAPHY + COUNTER + MEASUREMENT + *WATER + REVIEW + RESPIRATION + *PHYSIOLOGY/METABOLISM + VEGETATION + CONCENTRATION + TRANSPORT

042995
SUTRA-FOURCADE Y
MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM
CEA-R-3350 + WAPD-TRANS-0102 +. 35 PAGES, DECEMBER 1967

DISCUSSES THE PROBLEMS POSED BY TRITIUM - ITS DETECTION, APPARATUS USED, PROTECTION OF PERSONNEL IN AN ATMOSPHERE CONTAMINATED WITH TRITIUM, THE DIFFUSION OF TRITIUM IN THE ATMOSPHERE, DECONTAMINATION, ETC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

DECONTAMINATION + ATMOSPHERIC DIFFUSION + ATMOSPHERIC POLLUTION + CONTAMINATION + PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + RADIATION MONITORS

043089
ALBENESIUS EL + MEYER LH
ANALYTICAL TECHNIQUES FOR THE USE AND CONTROL OF TRITIUM AT SAVANNAH RIVER
DU PONT DE NEMOURS (E.I.) AND COMPANY, SAVANNAH RIVER LABORATORY
DP-771 +. 18 PAGES, SEPTEMBER 1962

METHODS OF TRITIUM ANALYSIS THAT ARE USED TO MONITOR THE POTENTIAL HEALTH HAZARD AND TO CONTROL PROCESSES FOR TRITIUM PRODUCTION AT SAVANNAH RIVER ARE REVIEWED. THE ANALYTICAL APPLICATIONS OF TRITIUM PRODUCED IN FISSION ARE ALSO DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*FISSION PRODUCT RELEASE + MONITOR, PERSONNEL + HAZARD, RELATIVE + *ANALYTICAL TECHNIQUE + SAVANNAH RIVER PLANT + MONITOR, AREA

043804
OSTLUND HG
A RAPID-FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN
MIAMI UNIVERSITY, FLORIDA
TID-25345 +. 6 PAGES, FEBRUARY 1, 1970

PRESENTS A PROTOPYE FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN. WITHIN A FEW WEEKS IT WILL BEGIN TO UNDERGO TEST, AND FINAL SPECIFICATIONS WILL BE DETERMINED. THE MACHINE WILL COLLECT SIMULTANEOUSLY ONE SAMPLE OF ATMOSPHERIC HTO, AND ONE OF HT, FOR EACH SAMPLING PERIOD OF 5 TO 15 MINUTES. IT IS DESIGNED FOR USE IN AN AUTOMOBILE OR IN AN AIRCRAFT WITH PRESSURIZED CABIN. DURING THE REMAINING PART OF THE FIRST CONTRACT YEAR, WE WILL TAKE THE FIELD UNIT IN A CAR, STATION WAGON OR SMALL VAN, AND DRIVE THROUGH A COLD FRONT COLLECTING SAMPLES OF ATMOSPHERIC HTO AND HT FROM BOTH AIR MASSES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + HYDROGEN + TESTING + *ATMOSPHERIC POLLUTION + *SAMPLING + AIR + INSTRUMENTS, MISC.

044996
BLOCK S + HODGEKINS D + BARLOW O
RECENT TECHNIQUES IN TRITIUM MONITORING BY PROPORTIONAL COUNTERS
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-31131 +. 20 FIGURES, 2 TABLES, 13 REFERENCES, OCTOBER 25, 1971

USE OF PROPORTIONAL COUNTERS IS DESCRIBED FOR MONITORING TRITIUM IN AIR, IN WATER (OR URINE), AND ON CONTAMINATED SURFACES. THE SYSTEM FOR WATER IS BASED ON COUNTING ACETYLENE FORMED BY REACTION WITH CALCIUM CARBIDE. SENSITIVITY, IN MICROCI/LITER, IS 1 FOR COUNTING WITH AN INTERNAL PROPORTIONAL COUNTER AND 10 WITH AN IONIZATION CHAMBER. ACETYLENE IS PASSED THROUGH A DRIER INTO THE PROPORTIONAL COUNTER AND EXHAUSTED TO THE ATMOSPHERE. THE PEAK COUNT IS REACHED AFTER ABOUT 4 MIN OF ACETYLENE GENERATION. IN PREPARATION FOR THE NEXT SAMPLE THE REACTION VESSEL AND DRIER TUBE ARE WASHED TO REMOVE RESIDUAL CONTAMINATION, AND THE COUNTER IS FLUSHED WITH COMMERCIAL-GRADE PROPANE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COUNTER + MONITOR, LIQUID + SURFACE CONTAMINATION + *WATER + MONITOR, GAS + *ANALYTICAL TECHNIQUE + MONITOR, ENVIRONMENTAL + LRL

047841
KATKIEWICZ W + JACHYMEK A
TRANSISTORISED PORTABLE TRITIUM CONTAMINATION MONITOR
CENTRAL LABORATORY FOR RADIOLOGICAL PROTECTION, POLAND
CLOR-79/D +. 9 PAGES, 3 FIGURES, 4 REFERENCES, 1969 (IN POLISH)

FULLY TRANSISTORISED PORTABLE TRITIUM CONTAMINATION MONITOR WITH OPEN IONIZATION CHAMBER WAS DEVELOPED. MONITOR WAS APPLIED FOR SURFACE CONTAMINATION MEASUREMENTS FROM THE LEVEL OF 40 PCI/CM2. MONITOR HAS A TEMPERATURE DRIFT OF 0.5 DIV/C, SHORT TERM. DRIFT LOWER THAN 0.5 PERCENT/MIN, AND CURRENT DRAIN OF 1 MA.

AVAILABILITY - . NUCLEAR ENERGY INFORMATION CENTER OF THE POLISH GOVERNMENT COMMISSIONER FOR USE OF NUCLEAR ENERGY, PALACE OF CULTURE AND SCIENCE, WARSAW, POLAND

*MONITOR, SURFACE + POLAND + RADIATION MONITORS

049430
TRITIUM MONITOR
SAVANNAH RIVER LABORATORY
CAPE-1871 +. 1969

A PORTABLE MONITOR IS DESCRIBED WHICH ACCURATELY MEASURES TRITIUM CONCENTRATIONS BETWEEN 0.0001 AND 0.1 MICROCURIE/CC OF AIR. THE INSTRUMENT CONSISTS OF AN AIR PUMP, DEIONIZER, IONIZATION CHAMBER, LOGARITHMIC ELECTROMETER-AMPLIFIER AND A HIGH VOLTAGE POWER SUPPLY. AN INTERNAL RECHARGEABLE 12-V BATTERY POWERS THE MONITOR. A CONNECTOR IS PROVIDED SO THAT AN EXTERNAL 12-V BATTERY CAN BE USED IF THE MONITOR IS NEEDED FOR EXTENDED PERIODS OF TIME. AFTER CALIBRATION BY COMPARISON WITH A KANNE MONITORING SYSTEM UNDER VARYING LEVELS OF TRITIUM ACTIVITY, READINGS WERE REPRODUCIBLE WITHIN +-10%. (FOR DETAILS SEE TID-4100 SUPPL. 53) (SEE ALSO NSA 23: 16084).

*INSTRUMENT, AIR SAMPLING + MONITOR, GAS + INSTRUMENT, SURVEILLANCE + RADIATION MONITORS

051081
OSTLUND HG
STANDARDIZATION OF NATURAL TRITIUM MEASUREMENTS.
TELLUS 16 PAGES 131-134 1964

MEASUREMENT + INSTRUMENTS, MISC.

051100
MANN WB
THE NATIONAL BUREAU OF STANDARDS TRITIATED WATER STANDARDS.
INTERNATIONAL JOURNAL OF APPLIED RADIATION AND ISOTOPES 15 PAGES 628-628 1964

CODES AND STANDARDS + WATER

051956
BALLARD LF
A SENSITIVE TRITIUM MONITOR.
ORO-491 +.

MONITOR + INSTRUMENTS, MISC.

052185
DULCINO J
ASSAY OF TRITIUM AND CARBON-14 IN ANIMAL TISSUES BY LIQUID SCINTILLATION.
CLINICA CHINICA ACTA 8 PAGES 58-65 1963

CARBON + CHEMICAL ANALYSIS + LIQUID + ANIMAL + ORGAN + INSTRUMENTS, MISC.

055111
BARTON CJ + BUTLER HM + CUMMING RB + ROHWER PS
THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS
11 PAGES, 1 TABLE, 2 REFERENCES, NUCLEAR SAFETY, 13(3), PP. 225-235 (MAY-JUNE 1972)

A TRITIUM SYMPOSIUM SPONSORED BY THE WESTERN ENVIRONMENTAL RESEARCH LABORATORY OF THE ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA AT LAS VEGAS WAS HELD IN LAS VEGAS AUG. 30 TO SEPT. 2, 1971. NEARLY 100 PAPERS WERE PRESENTED COVERING A BROAD RANGE OF TOPICS, INCLUDING TRITIUM PRODUCTION, ITS MOVEMENT IN THE ENVIRONMENT, ENVIRONMENTAL RELEASE AND MONITORING, DETECTION AND MEASUREMENT, BIOLOGICAL EFFECTS, BIOKINETICS, APPLICATIONS IN BIOLOGY AND MEDICINE, AND HEALTH PHYSICS. THIS ARTICLE TOUCHES ON ALL ASPECTS OF THE MEETING, BUT PAPERS OF PARTICULAR INTEREST IN THE FIELD OF NUCLEAR SAFETY ARE EMPHASIZED.

*AIRBORNE RELEASE + *BIOMEDICAL + MONITOR, LIQUID + *MONITOR, AIR + ANALYTICAL TECHNIQUE + *MONITORING SYSTEM, RADIATION

056070
HUTH, GC + HEWKA, PV + GELEZUNAS, VL
RESEARCH ON AVALANCHE TYPE SEMICONDUCTOR RADIATION DETECTORS
GENERAL ELECTRIC COMPANY, PHILADELPHIA, PENNSYLVANIA
NYO-3246-TA-64. 121 PAGES, JANUARY 1970

IN THIS REPORTING PERIOD, SPECIAL EMPHASIS WAS PLACED ON THE CONTINUED DEVELOPMENT OF USES OF CONTOURED SILICON AVALANCHE DIODES AS RADIATION DETECTORS AND IT UNDERSTANDING RESISTIVITY STRIATIONS IN SILICON IN ORDER TO ATTAIN SILICON OF MORE UNIFORM AND HIGHER GAIN. BORON CONTAMINATION AND CRYSTAL GROWTH RATE ARE PARAMETERS CURRENTLY UNDER STUDY. THE APPLICATION OF AVALANCHE TECHNOLOGY TO THE PRACTICAL SOLUTION OF PROBLEMS IN RADIATION DETECTION CONTINUES TO GROW. DETECTORS WITH ACTIVE DETECTION AREAS OF UP TO 3 CM2 HAVE BEEN FABRICATED WIT INTRINSIC COUNTING EFFICIENCIES FOR C-14 OF UP TO 40 PERCENT AND WITH LOW BACKGROUND RATES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SOLID STATE DEVICE + DOSE MEASUREMENT, EXTERNAL + *INSTRUMENT, COMPONENT + R AND D PROGRAM + RADIATION MONITORS

056432
FUKUDA S + YOSHIDA Y
EXPERIENCE IN OPERATIONAL HEALTH PHYSICS AND DEVELOPMENT OF MONITORING TECHNIQUE IN JAPAN
JAPAN ATOMIC ENERGY RESEARCH INSTITUTE
A/CONF.49/P/824 + CONF-710901-346 +. 23 PAGES, 8 FIGURES, 4 TABLES, 17 REFERENCES, FROM THE FOURTH UNITED NATIONS INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, SEPTEMBER 6-16, 1971

IN THIS PAPER, EXPERIENCES OF OPERATIONAL HEALTH PHYSICS IN THE MAIN FACILITIES OF THE JAERI ARE DESCRIBED. THIS PAPER ALSO DESCRIBES THE DEVELOPMENT OF MONITORING TECHNIQUE FOR AIRBORNE RADIOACTIVE MATERIALS SUCH AS RADIOIODINE AND THE METHOD USING PORTABLE INSTRUMENTS FOR EVALUATING NEUTRON DOSE EQUIVALENT, AND THE DEVELOPMENT OF LUNG MONITORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

IODINE + MPC + ANALYTICAL TECHNIQUE + *MONITOR, ENVIRONMENTAL + DOSE MEASUREMENT, EXTERNAL + DOSE CALCULATION, EXTERNAL + FISSION PRODUCT, AIRBORNE + *JAPAN + *PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + *RADIATION EXPOSURE, RECORD KEEPING + EXCRETION + RADIATION EXPOSURE + LUNG + BODY BURDEN

057549
JOHNS FB + JAQUISH RE
ANALYSIS OF ATMOSPHERIC GASES
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY
7 PAGES, 2 REFERENCES, PAPER PRESENTED AT THE ELEVENTH USAEC AIR CLEANING CONFERENCE, RICHLAND, WASHINGTON, AUGUST 31-SEPTEMBER 3, 1970

THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY COLLECTS AND ANALYZES RADIONUCLIDES WHICH OCCUR IN THE GASEOUS STATE IN THE ENVIRONMENT. A VARIETY OF SAMPLERS ARE USED DEPENDING UPON THE TYPE OF GAS BEING SAMPLED. THE MIXTURES OF GASES ARE SEPARATED IN THE LABORATORY USING LOW TEMPERATURE ADSORPTION AND GAS CHROMATOGRAPH TECHNIQUES. AFTER SEPARATION, THE QUANTITY OF RADIOACTIVITY IS DETERMINED BY COUNTING. THE GASES ROUTINELY SAMPLED AND ANALYZED ARE XENON, WATER VAPOR, KRYPTON, CARBON DIOXIDE AND RADON.

*AIRBORNE RELEASE + KRYPTON + *MOLECULAR SIEVE + NOBLE GAS + XENON + SAMPLING + ANALYTICAL TECHNIQUE + *MONITORING SYSTEM, RADIATION + CALIBRATION + RADIATION MONITORS

061201
SAX NI + DALY JC + GABAY JJ
A TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING TRITIATED MOISTURE
NEW YORK STATE DEPARTMENT OF HEALTH, ALBANY
7 PAGES, NUCLEAR APPLICATIONS AND TECHNOLOGY, VOL. 7, PG. 106-112 (JULY 1969)

A SILICA GEL SAMPLER FOR TRITIATED MOISTURE WAS DEVELOPED TO TRACE THE EFFLUENT FROM A NUCLEAR FUEL REPROCESSING PLANT. AN EXTENSIVE STUDY OF THE AREA SURROUNDING NUCLEAR FUEL SERVICES, INC., TO DETERMINE EXPERIMENTALLY THE MAXIMUM CONCENTRATION OF THE STACK EFFLUENT. BASED ON EXPERIMENTAL MAXIMUM CONCENTRATION VALUES, AN ESTIMATE OF THE EMISSION RATE WAS MADE UNDER VARIOUS METEOROLOGICAL CONDITIONS.

*CONCENTRATION, MAXIMUM + ATMOSPHERIC DIFFUSION EXPERIMENT + TRACER, RADIOACTIVE + *SAMPLING + SOURCE, ELEVATED

061410
COCHRAN JA + SMITH DG + MAGNO PJ + SHLEIEN B
AN INVESTIGATION OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL REPROCESSING PLANT
PUBLIC HEALTH SERVICE, BUREAU OF RADIOLOGICAL HEALTH, MARYLAND
BRH/NERHL-70-3 +. 39 PAGES, 11 FIGURES, 14 TABLES, 12 REFERENCES, JULY 1970

DESCRIBES STUDIES CARRIED OUT AT AN OPERATING NUCLEAR FUEL REPROCESSING PLANT FOR THE PURPOSES OF CHARACTERIZING THE STACK EFFLUENT, MEASURING THE ENVIRONMENTAL LEVELS OF ACTIVITY DUE TO COMPONENTS OF STACK RELEASE, AND EVALUATING INSTRUMENTATION AND METHODOLOGY USED TO SAMPLE BOTH AT THE STACK AND IN THE ENVIRONMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT + IODINE + KRYPTON + *MEASUREMENT + SAMPLING + *STACK + *MONITOR, ENVIRONMENTAL + POPULATION EXPOSURE + METEOROLOGY + *FUEL REPROCESSING + INSTRUMENTS, MISC.

061489
MEGERTH FH
ZIRCALOY - CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT II, MAY - JULY 1970
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
GEAP-10217 +. 52 PAGES, AUGUST 1970

PROGRESS REPORT ON STUDY OF PERFORMANCE OF SA-1 FUEL RODS (ZIRCALOY-2 CLADDING, UO2 FUEL). DESCRIBES EXAMINATIONS AND ANALYSES OF THE RODS (GAMMA SCANNING, DIAMETRAL MEASUREMENTS, EXAMINATIONS OF DE-CRUDDED RODS, NEUTRON RADIOGRAPHY OF RODS, GAS COLLECTION, AND ANALYSES OF CLADDING FOR TRITIUM).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CLADDING + FISSION GAS RELEASE + *FUEL BURNUP + FLAW + CRUD + ZIRCALOY + *EXAMINATION + SURFACE FILM DEPOSIT + EXPANSION + *FUEL ROD

061931
BUTLER HM + HAYWOOD FF
RADIATION SAFETY PRACTICES - OPERATION HENRE
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CEX-65.05 +. 34 PAGES, APRIL 1970

DURING 1967 AN EXPERIMENT WAS CONDUCTED AT THE NEVADA TEST SITE USING A HIGH-YIELD-NEUTRON GENERATOR SUPPORTED AT SEVERAL ELEVATIONS ON A 1527-FT STEEL TOWER. NUMEROUS PERSONNEL RADIATION HAZARDS WERE ASSOCIATED WITH THE ROUTINE OPERATION OF THIS GENERATOR, AND SPECIALIZED EQUIPMENT AND PROCEDURES WERE REQUIRED. THE MOST NOTABLE HAZARD RESULTED FROM HANDLING TARGETS FOR THE GENERATOR, EACH OF WHICH CONTAINED 1500 TO 2000 CI OF 3H. HANDLING WAS REQUIRED FOR TARGET FABRICATION, PACKING AND SHIPPING, MOUNTING ONTO GENERATOR, REMOVAL AND TRANSFER TO STORAGE, AND DISPOSAL OF WASTES. THIS REPORT INCLUDES AREA MONITORING AND BIO-SAMPLING TECHNIQUES, INTERNAL-DOSE ESTIMATION, AND SPECIFIC PROCEDURES FOR LIMITING PERSONNEL EXPOSURE.

061931 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HAZARD, RELATIVE + *TESTING + TRANSPORTATION AND HANDLING + *WASTE DISPOSAL + WASTE STORAGE + SAMPLING + DOSE CALCULATION, INTERNAL + *NEVADA TEST SITE + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + MONITOR, AREA

061936
VINOGRADOV AP + DEVIRTS AL + DORKINA EI
THE CURRENT TRITIUM CONTENTS OF NATURAL WATERS
INSTITUTE OF GEOCHEMISTRY AND ANALYTICAL CHEMISTRY, MOSCOW
15 PAGES, GEOCHEMSITRY INTERNATIONAL, VOL. 5, 952-966 (1968)

TRITIUM ANALYSES WERE MADE ON A NUMBER OF WATER AND PLANT SAMPLES COLLECTED PRIMARILY DURING 1966 TO 1968 IN THE WESTERN USSR. THE ANALYSES WERE MADE BY GAS-PROPORTIONAL COUNTER. THE COUNTERS WERE STEEL OR COPPER IN CONVENTIONAL STEEL SHIELDS WITH A RING OF GEIGER GUARD COUNTERS IN ANTICOINCIDENCE WITH THE MAIN COUNTER. RESULTS ARE GIVEN.

*WATER + ANALYTICAL TECHNIQUE + USSR + *MONITORING PROGRAM, ENVIRONMENTAL + *CONCENTRATION

063405
ZAK WM + LARSEN OW
CALIBRATION OF AIRBORNE AND GASEOUS ACTIVITY MONITORS USED IN THE DR3 REACTOR BY AR-41 AND XE-133
DANISH ATOMIC ENERGY COMMISSION, RESEARCH ESTABLISHMENT, HEALTH PHYSICS DEPARTMENT, RISO, DENMARK
RISO-M-1215 + H/TM-208 +. 15 PAGES, 17 FIGURES, TABLES, 2 REFERENCES, DECEMBER 1970

RADIATION-MEASURING INSTRUMENTS USED IN THE DR 3-REACTOR HAVE BEEN CALIBRATED FOR GASEOUS AND AIRBORNE PARTICULATE ACTIVITY. THE MONITORS CONCERNED ARE - (1) INSTRUMENTS INSTALLED IN THE DR 3 PLANT (FISSION GAS STATION MONITOR, GAMMA AIR DUCT MONITORS, THE STACK MONITOR). (2) MOVEABLE HEALTH-PHYSICS AIR MONITORS AVAILABLE IN THE PLANT. CALIBRATION METHODS AND THE CALIBRATION CURVES AGAINST AR-41 AND XE-133 AS WELL AS THE ENERGY RESPONSE CURVES ARE DESCRIBED AND SHOWN.

FISSION PRODUCT, IODINE + *XENON + ARGON + MONITOR, AIR + MONITOR, GAS + ANALYTICAL TECHNIQUE + RISO + *MONITORING SYSTEM, RADIATION + CALIBRATION + RADIATION MONITORS

063489
KANTER M
LOW LEVEL TRITIUM MEASURING SYSTEM
TECHNION-ISRAEL INST. OF TECH., HAIFA
NP-18661 +. 58 PAGES, MARCH 1967 (IN HEBREW AND ENGLISH)

THE SYSTEM DESCRIBED IN THIS WORK IS USED IN TRACER MEASUREMENTS OF BIOLOGICAL PROCESSES. THE ACTIVITY OF THE RADIOACTIVE TRACERS IS MEASURED IN A LIQUID SCINTILLATOR. THE MAIN LIMITING FACTORS IN SUCH MEASUREMENTS ARE THE PULSES DUE TO THE THERMIONIC EMISSION FROM THE PHOTOCATHODE OF THE PHOTOMULTIPLIER WHICH ARE IN THE ENERGY RANGE OF THE GAMMA RADIATION TO BE MEASURED. THE NUMBER OF THESE NOISE PULSES IS VERY LARGE IN COMPARISON TO SOURCE PULSES. THE SYSTEM DEVELOPED REDUCES THE THERMIONIC NOISE TO LEVEL WHICH ENABLES MEASUREMENT OF TRACER ACTIVITIES TO BE CARRIED OUT IN A SHORT TIME.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*MONITOR, GAS + SYSTEM DESCRIPTION + *EQUIPMENT DESIGN + MONITORING SYSTEM, RADIATION + BIOLOGICAL CONTROL + RADIATION MONITORS

064018
OSTLUND JG
A RAPID FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN
MIAMI UNIVERSITY, FLORIDA
TID-25693 +. 35 PAGES, (JUNE 1970)

A SAMPLING SYSTEM FOR HT IN THE ATMOSPHERE WAS DESIGNED AND BUILT. IT UTILIZES TRITIUM-FREE HYDROGEN AS A CARRIER, ADDED TO THE AIR, AND CATALYTIC COMBUSTION AT HIGH FLOW RATES. THE RESULTING WATER IS ABSORBED IN THE SAME CATALYST. SAMPLING TIMES ARE AS SHORT AS TEN MINUTES. THE CATALYST-ABSORBER WITH THE DESIRED PROPERTIES WAS DEVELOPED, CONSISTING OF PD METAL CARRIED ON MOLECULAR SIEVE. THE SAMPLING SYSTEM WAS DESIGNED FOR USE IN AN AUTOMOBILE OR IN AN AIRCRAFT. THE ATMOSPHERIC HT CONTENT SHOWS A CONTINUED SLOW INCREASE OVER THE PAST FEW YEARS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*INSTRUMENT, AIR SAMPLING + CATALYST + ABSORPTION + CONCENTRATION

064263
BRUNDAGE RS + MOTES BG + GANT P
ON-LINE MONITOR OF NATURAL GAS LINES FOR HYDROGEN-3 AND KRYPTON-85
CER GEONUCLEAR CORPORATION, LAS VEGAS, NEVADA, CONTINENTAL OIL COMPANY, PONCA CITY, OKLAHOMA
6 PAGES, 4 FIGURES, 3 REFERENCES, NUCLEAR TECHNOLGOY, 11(3), PG. 400-405, (FEB. 1971)

064263 *CONTINUED*
A SYSTEM HAS BEEN DEVELOPED AND TESTED FOR CONTINUOUSLY MONITORING A NATURAL GAS STREAM FOR THE BETA ACTIVITY OF BOTH TRITIUM AND KR-85. THE SYSTEM USES A PROPORTIONAL COUNTER WHOSE SENSITIVE VOLUME IS LIMITED TO ABOUT 24% OF THE TOTAL VOLUME BY A SET OF FOUR SEPARATE CATHODE FRAMEWORDS. THIS FEATURE AVOIDS A BUILDUP OF BACKGROUND ACTIVITY DUE TO THE DAUGHTER PRODUCTS OF RN-222, WHICH TEND TO PLATE OUT IN INSENSITIVE REGIONS OF THE COUNTER. APPROPRIATE PRESSURE, TEMPERATURE, AND FLOW CONTROLS ARE PROVIDED TO OPERATE THE SYSTEM EITHER IN THE STATIC OR FLOWING MODE. IN THE LATTER, THE RESIDENCE TIME OF THE COUNTING GAS IS ABOUT TEN MINUTES.

*COUNTER + *DESIGN CRITERIA + *KRYPTON + *BETA EMITTER + *MONITOR, GAS + INSTRUMENT CALIBRATION + INSTRUMENT, FLOW + *FLOW + GAS + CONCENTRATION

064768
REINING WC + ALBENESIUS EL
CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT
E.I. DU PONT DE NEMOURS & COMPANY, + SAVANNAH RIVER PLANT, AIKEN, SOUTH CAROLINA
7 PAGES, 13 REFERENCES, 3 TABLES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 24, PAGE 276-283, 1963, (T1782)

CF NSIC NO. 64766. TRITIUM IS PRODUCED AS AN UNWANTED BYPRODUCT FROM NEUTRON IRRAD OF D2O IN THE REACTORS, AND FROM LI IRRADIATION. NOMOGRAM OF MINUTES TO ASSIMILATE 1 MCI OF HTO VS AIR ACTIVITY IN UCI OF HTO/CC GIVEN FOR DIFFERENT TYPES OF MASK AND SUIT PROTECTION. STACK MONITORS GIVE CONTINUOUS RECORD OF H3 CONCNS. TRITIUM EXPOSURE RECORD AT SAVANNAH AS FOLLOWS - YEAR, NO. OF ASSAYS, H3 UPTAKE BETWEEN 0.37 AND 1.0 MCI, H3 UPTAKE GREATER THAN 1.0 MCI - 1954, 2190, -, 0 - 1955, 2310, -, 2 - 1956, 2230, -, 13 - 1957, 4000, -, 49 - 1958, 3600, 307, 33 - 1959, 2590, 156, 22 - 1960, 2720, 452, 79 - 1961, 2690, 401, 73. AT URINARY H3 CONCNS GREATER THAN 20 UCI/L IN 75 CASES THE BIOL HALF-LIFE AVERAGED 10 DAYS. MAX AVERAGE WEEKLY CONCN OF H3 IN MILK FROM 3 LOCAL DAIRIES AND 2 FARMS WAS 7 X 10 (EXP -6) UCI/CC. MAX AVERAGE WEEKLY CONCN IN DRINKING WATER WAS 13% OF LIMIT SUGGESTED BY ICRP FOR LARGE POPULATIONS. AVERAGE AIR CONCN WAS 0.5 UCI/CC X 10 (EXP -9), WITH WEEKLY MAX OF 6.8, AND RAINWATER AVERAGED 16 X 10 (EXP -6) WITH WEEKLY MAX OF 180. CF NSIC NOS. 49702, 49713, 56158 FOR ADDNL SAVANNAH RIVER DATA ON TRITIUM.

MPBB + OXIDE + WATER + AIR + MILK + MONITOR, ENVIRONMENTAL + SAVANNAH RIVER PLANT + POPULATION EXPOSURE + *PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *EXCRETION, URINE + MAN + MATURE + EXPOSURE, BACKGROUND

065252
MARTER WL + PATTERSON CM
MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT
2 PAGES, AMERICAN NUCLEAR SOCIETY TRANSACTIONS, 14(1), PAGE 162-163, (JUNE 1971)

DETAILS THE VARIOUS METHODS OF MONITORING FOR TRITIUM IN ITS VARIOUS FORMS. POINTS OUT THE DIFFICULTIES OF CONTINUOUS MONITORING FOR LOW TRITIUM OXIDE CONCENTRATIONS. THE SAVANNAH RIVER PLANT IS A PRODUCER OF TRITIUM, AND CONSEQUENTLY THE MONITORING OF TRITIUM IN GASES, LIQUIDS, AND OTHER ENVIRONMENTAL MEDIA HAS BEEN OF PRIME IMPORTANCE SINCE STARTUP IN THE 1950S.

*MONITOR, LIQUID + MONITOR, STACK + *MONITOR, AIR + *MONITOR, GAS + *MONITOR, ENVIRONMENTAL + SAVANNAH RIVER PLANT + RADIATION MONITORS

066056
KNOWLES FE + BARATTA EJ
THE DETERMINATION OF ACCURACY AND PRECISION LIMITS FOR TRITIUM IN WATER
ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, PARKLWAN 188-40, WASHINGTON, D.C.
4 PAGES, RADIOLOGICAL HEALTH DATA AND REPORTS, 12(8), PAGE 405-09, AUGUST 1971

DESCRIBES THE PROCEDURE FOR ESTABLISHING A STANDARD DEVIATION (A) VALUE FOR ANALYSIS OF TRITIUM IN WATER AND DISCUSSES THE RESULTS OF A TECHNICAL EXPERIMENT TO TEST THE VALIDITY OF THIS VALUE. SINCE MANY STATE, FEDERAL AND LOCAL LABORATORIES ARE ANALYZING THIS RADIONUCLIDE ON A ROUTINE BASIS, A PROCEDURE OF QUALITY CONTROL TO ASSIST IN PRODUCING COMPARABLE AND ACCURATE DATA IS NECESSARY. AS MORE NUCLEAR POWER REACTORS AND NUCLEAR FUEL REPROCESSING PLANTS BECOME OPERATIVE, TRITIUM WILL BE INTRODUCED INTO THE ENVIRONMENT IN GREATER QUANTITIES. THEREFORE, OTHER AGENCIES ARE PREPARING FOR TRITIUM ANALYSIS CAPABILITY AND WILL BE DEPENDING UPON THIS QUALITY CONTROL PROGRAM TO ASSESS EQUIPMENT AND SAMPLE PREPARATION CAPABILITIES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

WATER + ANALYTICAL TECHNIQUE + RADIATION SAFETY AND CONTROL + CONCENTRATION

066272
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-3961 +. 49 PAGES, 1971

INCLUDES A 600-WORD TOPICAL SUMMARY ON GENETIC EFFECTS AT LOW DOSES. 200-300 WORD SUMMARIES ON PROJECTS IN THE SECTIONS, BIOLOGY (BIOCHEMISTRY AND MOLECULAR BIOLOGY, GENETICS AND POPULATIONS), AND POPULATION RESEARCH (HEREDITARY CHANGES IN VERTEBRATES, SOMATIC, AND GENETIC HARM IN HUMAN POPULATIONS). 50-150 WORD SUMMARIES IN THE SECTIONS, ENVIRONMENTAL RESEARCH (OFF-SITE AND EFFLUENT MONITORING, RADIOECOLOGY, PRODUCTIVITY STUDIES BY THE C-14 TECHNIQUE,

066272 *CONTINUED*
RADIATION PROCESSING OF WASTE WATER, LOW LEVEL COUNTING) AND HEALTH PHYSICS (PLASTIC FILM-FISSION FRAGMENT NEUTRON DOSIMETRY, NAI DETECTOR EFFICIENCY, THERMOLUMINESCENCE DOSIMETRY, TRITIUM MONITORING, RADIATION INSTRUMENT DEVELOPMENTS).

*BIOMEDICAL + DOSIMETRY + EFFLUENT + STRONTIUM + WASTE TREATMENT + XENON + DOSIMETRY, THERMOLUMINESCENCE + POPULATION EXPOSURE + CHALK RIVER + MONITORING PROGRAM, ENVIRONMENTAL + PLASTICS + LAKE + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + PHYSIOLOGY/METABOLISM + EFFECT, GENETIC + EFFECT, SOMATIC + *RADIATION EXPOSURE, CHRONIC + TRACE ELEMENT + MAN + RADIATION MONITORS

066861
SILVER WJ + SHAPIRO EG + GREENHOUSE NA + SCOWN KM
A TRITIUM STACK MONITOR WITH A WIDE DIGITAL RANGE
UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-73295 + CONF-710809-1 +. 17 PAGES, 1971

STACK EFFLUENT FROM EACH OF THE TWO STACKS IS DRAWN THROUGH INDIVIDUAL 1-LITER ION CHAMBERS AT APPROXIMATELY 20 LITERS/MIN. A POTENTIAL OF 1000 V IS MAINTAINED ON EACH ION CHAMBER TO MINIMIZE NONLINEARITY DUE TO RECOMBINATION. EACH CHAMBER OUTPUT CURRENT IS FED DIRECTLY INTO A CTF MOSFET CONVERTER. OUTPUT PULSES FROM EACH CONVERTER ARE COUNTED BY TWO PARALLEL SEVEN-DECADE SCALERS LOCATED AT THE CONTROL CONSOLE IN THE MAIN OFFICE AREA. THE CONVERTERS ARE CURRENTLY SET TO YIELD 10 COUNTS/CI.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*STACK + *MONITOR + *SYSTEM DESCRIPTION

068112
OSBORNE RV
MONITORING REACTOR EFFLUENTS FOR TRITIUM - PROBLEMS AND POSSIBILITIES
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, ONTARIO
AECL-4054 +. 31 PAGES, PRESENTED AT THE TRITIUM SYMPOSIUM, LAS VEGAS, NEVADA, AUGUST 30-SEPTEMBER 2, 1971

FOR MONITORING WATER EFFLUENTS, A PLASTIC SCINTILLATOR IS SENSITIVE TO 1 NCI/CC WITH ABOUT 1-MIN RESPONSE TIME. FOR AIR, THE PLASTIC SCINTILLATOR HAS THE ADVANTAGE OF EASIER DISCRIMINATION TO ELIMINATE INTERFERENCE FROM NOBLE GASES, AND SOMEWHAT HIGHER SENSITIVITY (LESS THAN 1 PCI/CC) AS COMPARED WITH IONIZATION METHODS (THOUGH THE LATTER HAVE THE ADVANTAGE OF SIMPLICITY). CONDENSATION, EXCHANGE WITH WATER OR COLLECTION IN LIQUID SCINTILLATOR ENABLE MONITORING OF LESS THAN 0.1 PCI/CC IN AIR, WITH RESPONSE TIMES OF FROM SEVERAL MINUTES TO HOURS. CHOICE OF SYSTEM DEPENDS UPON THE NEEDED SENSITIVITY AND RESPONSE TIME, LIKELY CONTAMINANTS AND RUNNING COSTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*EFFLUENT + MONITOR, LIQUID + *CONDENSATION + MONITOR, AIR + CHALK RIVER + RESPONSE TIME + *MONITOR + REVIEW + SYSTEM CAPABILITY + AECL + ABSORPTION + SYSTEM ANALYSIS + SENSITIVITY ANALYSIS + COST, OPERATING + RADIATION MONITORS

068572
PROJECT GASBUGGY - ON-SITE RADIOLOGICAL SAFETY DURING PRODUCTION TESTING, JAN. 1925, 1968-DEC. 31, 1969
EBERLINE INSTRUMENT CORPORATION, SANTA FE, NEW MEXICO
PNE-1006 + PNE-G-77 +. 44 PAGES, AUGUST 20, 1971

EBERLINE INSTRUMENT CORPORATION PROVIDED ON-SITE RADIOLOGICAL SAFETY SUPPORT SERVICES FOR PROJECT GASBUGGY DURING PRODUCTION TESTING. GAS RELEASED BY FLARING WAS MONITORED BY A SYSTEM THAT MEASURED THE TRITIUM AND KRYPTON (KR-85) CONCENTRATIONS. TRITIATED LIQUID WASTES REMOVED BY BULK LIQUID SEPARATORS WERE ANALYZED FOR TRITIUM AND THEN RELEASED AS VAPOR IN THE GAS FLARE. THE TOTAL AMOUNT OF TRITIUM AND KR-85 RELEASED AS VAPOR OR GAS DURING PRODUCTION TESTING THROUGH DECEMBER 31, 1969, WAS 2432 AND 364 CURIES, RESPECTIVELY. PERSONNEL WORKING ON-SITE DURING PRODUCTION TESTING DID NOT RECEIVE ANY SIGNIFICANT RADIATION EXPOSURE FROM THE TRITIUM OR KR-85.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*KRYPTON + *PLOWSHARE + *INSTRUMENT, SURVEILLANCE + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + ON SITE + GAS + *CONCENTRATION + RADIATION MONITORS

069312
HUTCHIN WH + BRADLEY AE + MORIMOTO EM + WADLEIGH W + WILLES E
FACILITY FOR THE DETERMINATION OF LOW-LEVEL TRITIUM IN BIOLOGICAL AND ENVIRONMENTAL SAMPLES
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-73128 +. 10 PAGES, JULY 22, 1971

SAMPLES HAVING LEVELS AS LOW AS 1 TU ARE COUNTED ROUTINELY. WATER SAMPLES ARE DISTILLED AFTER SEDIMENT IS REMOVED. THESE OPERATIONS ARE CONDUCTED UNDER AN INERT ATMOSPHERE TO AVOID CONTAMINATION WITH AMBIENT TRITIUM. VEGETABLE AND ANIMAL MATTER SAMPLES ARE FREEZE DRIED AND THE RESIDUE COMBUSTED TO WATER IN A SPECIAL APPARATUS CAPABLE OF HANDLING SMALL SAMPLES. CONTAMINATION OF THE LOW LEVEL FACILITY IS AVOIDED BY PRIOR SCREENING BY LIQUID SCINTILLATION COUNTING. SAMPLES LESS THAN 3,000 TU ARE CONVERTED TO HYDROGEN GAS BY PASSAGE OVER MAGNESIUM TURNINGS AND ARE COMPLETED IN AN INTERNAL GAS PROPORTIONAL COUNTER. IF THERE IS SUFFICIENT SAMPLE, ELECTROLYTIC ENRICHMENT INCREASE THE SENSITIVITY 75 TIMES.

069312 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COUNTER + EFFLUENT + SURVEY, ENVIRONMENT + *SURFACE WATER, NUCLIDE OCCURRENCE + *ANALYTICAL TECHNIQUE + MONITOR, ENVIRONMENTAL + LRL + LOW + RADIONUCLIDE UPTAKE + VEGETATION + RADIONUCLIDE TRANSFER + INSTRUMENTS, MISC.

070063
SPENCER DW + BREWER PG
ANALYTICAL METHODS IN OCEANOGRAPHY - I. INORGANIC METHODS
WOODS HOLE OCEANOGRAPHIC INSTITUTION, MASS.
69 PAGES, FIGURES, TABLES, REFERENCES, CRC CRIT. REV. SOLID STATE SCI., 1: 409-78 (SEPTEMBER 1970)

THE ANALYTICAL CHEMISTRY INVOLVED IN THE DETERMINATION OF THE MAJOR IONS, TRACE ELEMENTS, NUTRIENTS, DISSOLVED GASES, AND RADIONUCLIDES PRESENT IN SEAWATER IS DISCUSSED. PARTICULAR ATTENTION IS PAID TO RECENT DEVELOPMENTS AND TO THE TECHNIQUES THAT ARE ACTIVELY IN USE IN OCEANOGRAPHIC LABORATORIES. SEAWATER SAMPLING AND STORAGE METHODS ARE REVIEWED, AND TABLES OF THE TRACE ELEMENTS AND RADIONUCLIDES THAT HAVE BEEN DETERMINED IN THE OCEAN ARE GIVEN.

CARBON + CESIUM + ELEMENTS AND ISOTOPES + MEASUREMENT + *OCEAN AND SEA + STRONTIUM + THORIUM + URANIUM + *SURFACE WATER, NUCLIDE OCCURRENCE + *ANALYTICAL TECHNIQUE + *RADIOCHEMICAL ANALYSIS + *CONCENTRATION + *INORGANIC

070249
SALMON L + TOUREAU AER
RAPID EVALUATION OF RADIOACTIVE SAMPLES BY GAMMA-RAY SPECTROMETRY
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, DIDCOT, BERKS., UNITED KINGDOM
STI/PUB-380 + CONF-710705 + IAEA-SM-148-55 +. 17 PAGES, 10 FIGURES, 7 REFERENCES, PP. 339-355, DECEMBER 1971, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM HELD AT NEUHERBERG, GERMANY, JULY 5-9, 1971

GAMMA-RAY SPECTROMETRY PROVIDES A CONVENIENT AND RELATIVELY RAPID MEANS OF PERFORMING INSTRUMENTAL RADIOCHEMICAL ANALYSIS. THE TECHNIQUE IS USED REGULARLY AT HARWELL TO ESTIMATE HAZARDS FOLLOWING ANY INCIDENT BELIEVED TO INVOLVE THE ESCAPE OF RADIOACTIVITY. SPECTROMETRY MAY ALSO BE USED FOR MORE ROUTINE MONITORING OF RADIOACTIVITY NOT ONLY IN THE NEIGHBOURHOOD OF NUCLEAR ESTABLISHMENTS BUT OF THE ENVIRONMENT IN GENERAL. VARIOUS FORMS OF GAMMA-RAY SPECTROMETRY ARE DESCRIBED BRIEFLY WITH EXAMPLES OF APPLICATIONS TO LOCAL ENVIRONMENTAL MONITORING. SINCE NUMERICAL METHODS OF ANALYSIS ARE USED THE APPROPRIATE DATA HANDLING PROBLEMS ARE DISCUSSED.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

FALLOUT + *FISSION PRODUCT RELEASE + IAEA + IODINE + *MONITOR, EMERGENCY + RAINOUT + *SOLID STATE DEVICE + UNITED KINGDOM + DATA PROCESSING + MONITOR, ENVIRONMENTAL + TANTALUM + *RADIOCHEMICAL ANALYSIS + RADIOACTIVITY RELEASE + *SPECTROMETRY, GAMMA + *GAMMA EMITTER + EUROPIUM + GAS + RADIATION MONITORS + FILTERS

070252
BOGEN DC + WELFORD GA
APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL BETA AND ALPHA ASSAY
U. S. ATOMIC ENERGY COMMISSION, NEW YORK, N.Y.
STI/PUB-280 + CONF-710705 + IAEA-SM-148-3 +. 7 PAGES, 3 TABLES, 2 FIGURES, 5 REFERENCES, PP. 383-389, DECEMBER 12, 1971, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM HELD AT NEUHERBERG, GERMANY, JULY 5-9, 1971

TOTAL BETA AND ALPHA MEASUREMENTS HAVE BEEN PERFORMED, SIMULTANEOUSLY, BY LIQUID SCINTILLATION SPECTROMETRY. THE BETA MEASUREMENT CLASSIFIES THE ISOTOPES BY ENERGY DISCRIMINATION INTO TWO CATEGORIES - LOW ENERGY (H-3, ETC.) AND FISSION PRODUCTS OR ACTIVATION PRODUCTS OF MEDIUM-TO-HIGH ENERGY. THE ALPHA MEASUREMENT IS PERFORMED BY RATIO TECHNIQUES SINCE THE ALPHA SPECTRUM IS LOCATED IN THE MEDIUM TO HIGH ENERGY BETA SPECTRAL REGION. THEREFORE, ONE MEASUREMENT PROVIDES THE FOLLOWING INFORMATION FOR AN ENVIRONMENTAL SAMPLE - (1) RELATIVE CONTRIBUTION OF TRITIUM AND OTHER LOW ENERGY EMITTERS TO THE TOTAL BETA SPECTRUM; (2) CONTRIBUTION OF FISSION AND ACTIVATION PRODUCTS TO THE TOTAL BETA SPECTRUM; AND (3) TOTAL ALPHA ENERGY BETA AND 0.1 DPM/ML FOR ALPHA. A DESCRIPTION OF OUR EXPERIMENTAL RESULTS, DATA PROCESSING, APPLICATION TO ENVIRONMENTAL MONITORING AND COMPARISON OF THIS TECHNIQUE TO EXISTING METHODS IS GIVEN.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

IAEA + *MONITOR, EMERGENCY + DATA PROCESSING + *ANALYTICAL TECHNIQUE + MONITOR, ENVIRONMENTAL + *SPECTROMETRY, ALPHA + *SPECTROMETRY, BETA + ENERGY LEVEL + COMPARISON + RADIATION MONITORS

070255
KORANDA JJ + PHELPS PL + ANSPAUGH LR + HOLLADAY G
SAMPLING AND ANALYTICAL SYSTEMS FOR MEASURING ENVIRONMENTAL RADIOACTIVITY
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
STI/PUB-280 + CONF-710705 + IAEA-SM-148-36 +. 28 PAGES, 19 FIGURES, 2 TABLES, 16 REFERENCES, PP. 587-614, DECEMBER 12, 1971, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM HELD AT NEUHERBERG, GERMANY, JULY 5-9, 1971

RAPID METHODS OF SAMPLING AND QUANTITATING AIRBORNE TRITIATED WATER, RADIOACTIVE PARTICULATES AND A WIDE RANGE OF ENVIRONMENTAL SAMPLES HAVE BEEN DEVELOPED TO DOCUMENT THE RELEASES OF RADIOACTIVITY ASSOCIATED WITH USES OF NUCLEAR EXPLOSIVES, REACTOR OPERATION AND BASIC

070255 *CONTINUED*
RADIOECOLOGICAL STUDIES. TWO TYPES OF ATMOSPHERIC WATER SAMPLERS HAVE BEEN USED IN ENVIRONMENTAL STUDIES CONDUCTED IN REMOTE FIELD OPERATIONS. A SIMPLE COLD-PIPE SAMPLER OF SEVERAL DESIGNS EMPLOYING EITHER LN OR CO2 HAS BEEN USED IN LABORATORY STUDIES AND FIELD STUDIES. A MORE COMPLEX SAMPLER WHICH MAY EVENTUALLY BE ACTUATED USING A COLUMN OF MAGNESIUM PERCHLORATE OR MOLECULAR SIEVE HAS ALSO BEEN USED. A SAMPLING AND ANALYTICAL SYSTEM FOR DETERMINING AIR CONCENTRATIONS OF RADIOACTIVE PARTICULATES HAS BEEN USED SUCCESSFULLY IN SEVERAL TYPES OF RADIOECOLOGICAL STUDIES ASSOCIATED WITH NUCLEAR CRATERING EXPERIMENTS, MONITORING OF WORLDWIDE AND CLOSE-IN FALL-OUT DEPOSITION, AND REACTOR STUDIES. DETAILS ARE GIVEN FOR THE SAMPLING PROGRAM AND THE ANALYTICAL PROCEDURES.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N. Y. 10016

DEPOSITION + FALLOUT + IAEA + MEASUREMENT + *MONITOR, EMERGENCY + *ATMOSPHERIC POLLUTION + *SAMPLING + *ANALYTICAL TECHNIQUE + MONITOR, ENVIRONMENTAL + NUCLEAR DETONATION + PARTICLE, RADIOACTIVE + *SPECTROMETRY, GAMMA + CONCENTRATION

071338
TRITIUM STACK MONITOR
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
CAPE-2110 +. 25 FIGURES, APRIL 29, 1971

A STACK MONITORING SYSTEM IS DESCRIBED WHICH GIVES AN IMMEDIATE INDICATION OF THE TOTAL AMOUNT OF T RELEASED DURING A PERIOD OF TIME IN THE RANGE OF ONE TO 10 MILLION CI. THE SYSTEM CONSISTS OF AN AIR MOVER (NOT DESCRIBED), A ONE LITER ION CHAMBER, A MOSFET CURRENT-TO-FREQUENCY CONVERTER, A SEVEN-DECADE ACCUMULATOR, A SIX-DECADE SCALER-TIMER, AND PRINTER. THE SCALER ACTIVATES AN ALARM WHEN ACTIVITY IS RELEASED THAT EXCEEDS PRESET LEVELS AT ANY TIME DURING A TEN MINUTE PERIOD. IN EACH TEN MINUTE PERIOD, THE SCALER PRINTS OUT AND RESETS PROVIDING A CONTINUOUS RECORD OF T RELEASE. THE ACCUMULATOR OPERATES IN PARALLEL WITH THE SCALER AND SUMS THE ACTIVITY RELEASED UNTIL THE ACCUMULATOR IS MANUALLY RESET.

*MONITOR, STACK + SYSTEM DESCRIPTION + RADIATION MONITORS

073286
COCHRAN JA + GRIFFIN WR + TROIANELLO EJ
CHARACTERIZATION OF TRITIUM STACK EFFLUENT FROM A FUEL REPROCESSING PLANT
ENVIRONMENTAL PROTECTION AGENCY, MASSACHUSETTS
1 PAGE, 7 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 15(1) P. 79 (JUNE 1972)

A STUDY TO DETERMINE THE NATURE OF STACK TRITIUM RELEASE AND DEVELOP A SAMPLING METHOD FOR OBTAINING TRITIUM AIR CONCENTRATIONS AT THE STACK AND IN THE ENVIRONS OF A NUCLEAR FUEL REPROCESSING PLANT. THE STUDY WAS CARRIED OUT AT NUCLEAR FUEL SERVICES, INC. THE STUDY WAS DESIGNED TO (A) CHARACTERIZE THE STACK TRITIUM EFFLUENT IN THE GASEOUS AND WATER VAPOR FORMS, DURING NORMAL PLANT OPERATIONS, (B) DETERMINE THE WEEKLY AVERAGE TRITIUM AIR CONCENTRATIONS AT FIVE SELECTED SITES OVER A FOUR-MONTH PERIOD, AND (C) EVALUATE METHODS USED FOR SAMPLING AT THE STACK AND IN THE ENVIRONMENT.

AVAILABILITY - JOSEPH A. COCHRAN, FIELD OPERATIONS BRANCH, DIVISION OF SURVEILLANCE AND INSPECTION, OFFICE OF RADIATION PROGRAMS, ENVIRONMENTAL PROTECTION AGENCY, 109 HOLLON STREET, WINCHESTER, MASSACHUSETTS 01890

*EFFLUENT + *MONITOR, STACK + *SAMPLING + AIR + *RADIOACTIVITY RELEASE + FUEL REPROCESSING + *MONITOR, AREA + CONCENTRATION

074336
KONIG LA + WINTER M
GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE TRACER
GESELLSCHAFT FUR KERNFORSCHUNG M.B.H., KARLSRUHE
KFK-1667 +. 34 PAGES, 2 TABLES, 5 FIGURES, 5 REFERENCES, NOVEMBER 1972

DISCUSSES DISPERSION EXPERIMENTS WITH TRITIATED WATER VAPOR AS THE TRACER CONDUCTED SO FAR AT THE KARLSRUHE NUCLEAR RESEARCH CENTER. THE HEIGHT OF THE SOURCE WAS 100 M. TO EVALUATE THE EMISSION, AIR HUMIDITY SAMPLES WERE FROZEN ON COLD SURFACES AT UP TO 25 POINTS IN THE FIELD OF DISPERSION. THE RESULTS SHOW CONSIDERABLE DEVIATIONS FROM THEORETICAL VALUES BOTH WITH RESPECT TO THE AMOUNTS AND THE SOURCE DISTANCES OF THE ABSOLUTE MAXIMA OF CONCENTRATION. (IN GERMAN)

AVAILABILITY - GESELLSCHAFT FUER KERNFORSCHUNG MGH, 75 KARLSRUHE, POSTFACH 947, GERMANY

*ATMOSPHERIC DIFFUSION EXPERIMENT + COMPARISON, THEORY AND EXPERIENCE + INSTRUMENT, AIR SAMPLING

074953
ROBINSON B
A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE
MONSANTO RESEARCH CORPORATION, MIAMISBURG, OHIO
CONF-721030 +. 14 PAGES, 3 REFERENCES, PP. 465-479, PAPER PRESENTED AT THE AEC POLLUTION CONTROL CONFERENCE, HELD IN OAK RIDGE, TENN. ON OCTOBER 25, 1972

074953 *CONTINUED*

A PRACTICAL, RUGGEDIZED, TRITIUM FIELD AIR SAMPLER FOR SIMULTANEOUS, DIFFERENTIAL SAMPLING OF THE ENVIRONMENT FOR TRITIUM OXIDE AND ELEMENTAL HYDROGEN IS DESCRIBED. THE DETECTION SENSITIVITY APPROACHES ENVIRONMENTAL TRITIUM BACKGROUND LEVELS. PRELIMINARY DATA ALONG WITH THE PRINCIPAL OF OPERATION FOR BOTH THE COLLECTION AND DESORPTION SYSTEM IS PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COUNTER + DESIGN CRITERIA + *HYDROGEN + *OXIDE + *INSTRUMENT, AIR SAMPLING + MONITOR, ENVIRONMENTAL

075281
MOSKALEV YI
TRITIUM OXIDE
AEC-TR-7298 +. 363 PAGES, FIGURES, TABLES, REFERENCES, 1968

A MONOGRAPH GENERALIZING EXTENSIVE THEORETICAL AND EXPERIMENTAL MATERIAL ON THE DISTRIBUTION, KINETICS OF EXCHANGE, AND BIOLOGICAL ACTION OF TRITIUM OXIDE. THE MODERN DATA ON THE PHYSICAL PROPERTIES OF DEUTERIUM AND TRITIUM, THE ISOTOPIC EXCHANGE OF HYDROGEN, THE KINETICS OF ISOTOPIC EXCHANGE, METHODS FOR MEASURING TRITIUM IN BIOLOGICAL MEDIA, THE KINETICS OF WATER EXCHANGE IN THE ANIMAL AND HUMAN ORGANISM, PATHWAYS AND RATES OF ASSIMILATION OF TRITIUM OXIDE THROUGH THE GASTROINTESTINAL TRACT, LUNGS, AND SKIN, AND THE KINETICS OF THE ELIMINATION OF TRITIUM OXIDE FROM THE ANIMAL AND HUMAN ORGANISM ARE ANALYZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIOMEDICAL + DEUTERIUM + HYDROGEN + MEASUREMENT + *OXIDE + *CRITICAL NUCLIDE PATHWAY + ION EXCHANGE + *PROPERTY, PHYSICAL + ANIMAL + ASSIMILATION + *DISTRIBUTION + ELIMINATION + GI TRACT + LUNG + MAN + SKIN + *BIOLOGICAL CONTROL + *METABOLIC KINETICS

075312
KOENIG LA + WINTER M
TRITIUM CONTAMINATION OF THE ENVIRONMENT
GESELLSCHAFT FUER KERNFORSCHUNG MBH, KARLSRUHE, ABTEILUNG STRAHLENSCHUTZ UND SICHERHEIT
14 PAGES, 4 TABLES, 16 REFERENCES, PRESENTED AT THE COMMISSION OF THE EUROPEAN COMMUNITIES INTERNATIONAL SYMPOSIUM ON RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT, ROME, SEPTEMBER 1971

MEASUREMENT WITHOUT PRIOR CONCENTRATION IS RECOMMENDED AND DESCRIBED (THE INSTA-GEL COCKTAIL, INTERNAL SCINTILLANT). SINCE TRITIUM IN AIR IS LARGELY IN THE FORM OF TRITIATED WATER, IN THIS CASE SAMPLING BY COLLECTION ON A COLD FINGER IS RECOMMENDED. THE AUTHORS' RESULTS FOR SURFACE-, GROUND-, AND RAINWATER ARE COMPARED WITH THOSE OF OTHERS. CONCENTRATIONS RANGED FROM 0.4-1.4 PCI/ML, AND THE AVERAGE DOSE TO MAN WAS ABOUT 0.1 MREM/YEAR. ALTHOUGH THE AIR MOISTURE IN CERTAIN KARLSRUHE LABORATORIES REACHED GREATER THAN 3 PCI/ML, THE MAXIMUM DOSE FROM THIS SOURCE WAS ABOUT 0.01 MREM/YEAR. (MOST OF THE DOSE IS FROM WORLD WIDE CONTAMINATION FROM NUCLEAR TESTING.)

AVAILABILITY - OFFICE FOR OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES, P.O.B. 1003, LUXEMBOURG 1

CONTAINMENT INSTRUMENTATION + MONITOR, LIQUID + *HUMIDITY, RELATIVE + MONITOR, SAMPLING + SAMPLING + SURFACE WATER, NUCLIDE OCCURRENCE + ANALYTICAL TECHNIQUE + DOSE CALCULATION, INTERNAL + GROUND WATER, NUCLIDE OCCURRENCE + NUCLEAR DETONATION + SURVEY, RADIATION + CRITICAL NUCLIDE PATHWAY + *ENVIRONMENT + KARLSRUHE + CONTAINMENT LEAK MONITOR + *RADIONUCLIDE UPTAKE + RADIONUCLIDE TRANSFER + EXPOSURE, BACKGROUND

075963
HANNAHS BJ + KERSHNER CJ
BIBLIOGRAPHY ON HANDLING CONTROL AND MONITORING OF TRITIUM (DEC. 1968-JAN. 1972)
MOUND LABORATORY, OHIO
LML-1946 +. 44 PAGES, SEPTEMBER 5, 1972

AN ANNOTATED BIBLIOGRAPHY PREPARED TO PROVIDE A SOURCE OF INFORMATION ON RECENT LITERATURE ON SUBJECTS RELATING TO THE CONTROL, MONITORING, AND HANDLING OF TRITIUM. PARTICULAR EMPHASIS WAS PLACED ON LITERATURE THAT RELATES TO THE TRITIUM HANDLING AND CONTROL NEEDS OF THE DIVISION OF MILITARY APPLICATIONS/USAEC. THE PERIOD COVERED BY THIS BIBLIOGRAPHY EXTENDS FROM 1968 TO JANUARY 31, 1972, AND INCLUDES BOTH JOURNAL AND REPORT LITERATURE. KEYWORD AND AUTHOR INDEXES ARE PROVIDED AND A SPECIAL SUBJECT-GROUPING FORMAT FOLLOWED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIBLIOGRAPHY + TRANSPORTATION AND HANDLING + *MONITOR + RADIATION SAFETY AND CONTROL + MILITARY CONSIDERATION + AGENCY, AEC

077129
MATUSZEK JM + KUNZ CR + PAPERIELLO CJ
CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES
NEW YORK STATE DEPARTMENT OF HEALTH
PAPER NO. 22 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (SEE CONF-730603--)

THE RADIOLOGICAL SCIENCES LABORATORY OF THE NEW YORK STATE DEPARTMENT OF HEALTH IS CONDUCTING A STUDY TO CHARACTERIZE THE GASEOUS RADIOACTIVE EFFLUENTS FROM NUCLEAR FACILITIES. AT THIS TIME,

077129 *CONTINUED*
HOLD-UP TANK, COVER-GAS, STRIP-GAS AND STACK EFFLUENT SAMPLES FROM TWO PWR'S, A BWR AND A GAS-COOLED REACTOR HAVE BEEN ANALYZED. GASEOUS SPECIES ARE CHROMATOGRAPHICALLY SEPARATED, THEN COUNTED IN GAS PROPORTIONAL COUNTING SYSTEMS. SPECTROMETRIC MEASUREMENTS HAVE RESULTED IN THE IDENTIFICATION AND QUANTIFICATION OF H-3 (AS HYDROGEN GAS, WATER AND METHANE), C-14 (AS METHANE AND CARBON DIOXIDE), RADIOARGON, RADIOKRYPTON, RADIOXENON AND RADIOIODINE. EXPERIENCE IN SAMPLE COLLECTION, HANDLING, AND ANALYSIS ARE DISCUSSED WITH REGARD TO APPENDIX I REQUIREMENTS, PARTICULARLY WITH REGARD TO REPORTING REQUIREMENTS IMPOSED BY SAFETY GUIDE 21.

AVAILABILITY - JOHN M. MATUSZEK, NEW YORK STATE DEPARTMENT OF HEALTH, ALBANY, NEW YORK 12201

CARBON + *EFFLUENT + *CHROMATOGRAPHY + IODINE + KRYPTON + MPC + REGULATION + XENON + ARGON + *MONITOR, GAS + *ANALYTICAL TECHNIQUE + *RADIOLYTIC GAS + *GAS + *SPECTROMETRY + *POWER PLANT, NUCLEAR + NRC REGULATORY GUIDE

077164
TICE G
CONTINUOUS MONITOR FOR TRITIUM IN AIR WITH HIGH SENSITIVITY AND WIDE RANGE
JOHNSTON LABORATORIES
PAPER NO. 57 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973. (SEE - CONF-730603-)

THERE IS INCREASING CONCERN WITH THE EXPOSURE OF THE GENERAL POPULATION TO LOW-LEVEL RADIATION AND WITH THE ENVIRONMENTAL EFFECTS OF ANY POTENTIALLY HARMFUL DISCHARGE, REGARDLESS OF QUANTITY. IN THE CASE OF TRITIUM OXIDE, EXISTING CONTINUOUS MONITORS ARE INADEQUATE FOR MEASUREMENTS AT THE MPC FOR UNRESTRICTED AREAS OF 0.2 MICROCURIE/M3. THESE LOW LEVELS MUST BE MEASURED BY CONCENTRATION METHODS WHICH DO NOT YIELD A CONTINUOUS RECORD. DESCRIBED IS A BREADBOARD INSTRUMENT USING A WALL-LESS FLOW PROPORTIONAL COUNTER WITH ANTICOINCIDENCE SHIELD IN WHICH THE COUNTING GAS IS 85% METHANE AND 15% SAMPLE AIR. THE USEFUL RANGE OF THE INSTRUMENT IS 0.01 TO 600 MICROCURIE/M.

AVAILABILITY - GREGORY TICE, JOHNSTON LABORATORIES, COCKEYSVILLE, MARYLAND 21030

COUNTER + *MPC + *MONITOR, AIR + *AIR + ENERGY LEVEL + MONITOR, AREA + *CONCENTRATION + HPIS + RADIATION MONITORS

077165
BROWN R + MEYER HE + ROBINSON B
A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE
MOUND LABORATORY
PAPER NO. 58 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (SEE - CONF-730603--)

THE INSTRUMENT DESCRIBED IS A PRACTICAL, RUGGEDIZED, ULTRASENSITIVE TRITIUM FIELD AIR SAMPLER ASSEMBLED FOR THE SIMULTANEOUS, DIFFERENTIAL SAMPLING OF THE ENVIRONMENT FOR TRITIUM OXIDE AND ELEMENTAL TRITIUM. THE SYSTEM, BASED ON DIFFERENTIAL SAMPLING METHODS DEVELOPED BY OTHERS, UTILIZES HARDWARE ASSEMBLED AND PACKAGED IN SUCH A MANNER AS TO FACILITATE USE IN A VEHICLE OR IN FIELD OPERATIONS AS WELL AS IN LABORATORY MONITORING. THE DETECTION SENSITIVITY APPROACHES ENVIRONMENTAL TRITIUM BACKGROUND LEVELS BY THE EFFICIENT REMOVAL OF TRITIUM OXIDE AND GAS DIFFERENTIALLY FROM THE SAMPLED AIR STREAM AND ANALYSIS OF THE RECOVERED FRACTIONS BY LIQUID SCINTILLATION COUNTING.

AVAILABILITY - HERBERT E. MEYER, MOUND LABORATORY, MIAMISBURGH, OHIO 45342

COUNTER + *DESIGN CRITERIA + *INSTRUMENT, AIR SAMPLING + *MONITOR, AIR + MONITOR, ENVIRONMENTAL + ENERGY LEVEL + SENSITIVITY ANALYSIS + HPIS

077172
OLLER WL + PLATO PA
MINIMUM DETECTABLE ACTIVITY OF BETA EMITTERS BY BETA SPECTRUM ANALYSIS
UNIVERSITY OF MICHIGAN + NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH, ARKANSAS
PAPER NO. 65 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (SEE - CONF-730603--)

A NEW TECHNIQUE TO IDENTIFY UNKNOWN BETA-EMITTING RADIONUCLIDES AND PREDICT THEIR CONCENTRATIONS HAS BEEN DEVELOPED BY THE AUTHORS (1). THIS TECHNIQUE, WHICH USES A LIQUID SCINTILLATION ANALYZER COUPLED TO A 1024 CHANNEL PULSE-HEIGHT ANALYZER, HAS BEEN USED TO DETERMINE THE MINIMUM DETECTABLE ACTIVITIES FOR H-3, C-14, AND P-32 INDIVIDUALLY AND FOR COMBINATIONS OF THE THREE NUCLIDES AT DIFFERENT CONCENTRATIONS. DATA FOR THE MINIMUM DETECTABLE ACTIVITIES OF THE THREE NUCLIDES ARE PRESENTED IN GRAPHIC FORM. ISOTOPIC ANALYSIS OF BETA-EMITTING RADIONUCLIDES THAT HAVE MAXIMUM BETA DECAY ENERGIES THAT DIFFER BY AT LEAST 25 PERCENT IS POSSIBLE BY THIS TECHNIQUE.

AVAILABILITY - PHILLIP A. PLATO, SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF MICHIGAN, ANN ARBOR, MICHIGAN

CARBON + MEASUREMENT + PHOSPHORUS + SURVEY, RADIATION + *RADIOISOTOPE + *SPECTROMETRY, BETA + *RESPONSE SPECTRUM + *CONCENTRATION + *ENERGY SPECTRUM + HPIS

079191
MOGHISSI AA + CARTER MW
TRITIUM
807 PAGES, PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

'TRITIUM' IS BASED ON A SYMPOSIUM HELD FROM AUGUST 30 THROUGH SEPTEMBER 2, 1971, IN LAS VEGAS, NEVADA, AND COSPONSORED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA, LAS VEGAS. THE ORGANIZERS ATTEMPTED TO COVER THE ENTIRE SUBJECT, ALTHOUGH PRIMARY EMPHASIS WAS PLACED ON THE ENVIRONMENTAL ASPECTS OF TRITIUM. THE BOOK IS DIVIDED INTO TEN CHAPTERS COVERING THE HISTORY, PRODUCTION, MEASUREMENT, BIOLOGICAL EFFECTS AND KINETICS, ENVIRONMENTAL ASPECTS, APPLICATION AND HEALTH PHYSICS OF TRITIUM.

CONTAINMENT + EFFLUENT + MEASUREMENT + *PLOWSHARE + HAZARD, RELATIVE + *WASTE TREATMENT + *TEST, WEAPONS + *REACTOR, POWER + MONITOR, ENVIRONMENTAL + *NUCLEAR DETONATION + RADIOACTIVITY RELEASE + ENVIRONMENT + DATA COLLECTION + *PRODUCTION + RADIATION EFFECT + BIOLOGICAL CONTROL + *SOCIO/PHILOSOPHICAL CONSIDERATION + HPIS

077198
MANN WB
DETECTION AND MEASUREMENT (TRITIUM)
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C.
105 PAGES, PP. 86-191 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

CHAPTER THREE OF 'TRITIUM' DEALS WITH DETECTION AND MEASUREMENT THROUGH DEVELOPMENT OF STANDARDS, ANALYTICAL PROCEDURES, GAS COUNTING, ENRICHMENT AND ANALYSIS OF LOW-LEVEL SAMPLES, MONITORING DEVICES, MEASUREMENT DEVICES, LIMITS OF DETERMINATION, CONTINUOUS MONITORING, APPLICATIONS OF EMULSIONS IN COUNTING, AND NEW PROCEDURES FOR LIQUID SCINTILLATION COUNTING.

CODES AND STANDARDS + COUNTER + *MEASUREMENT + *ANALYTICAL TECHNIQUE + MONITOR + REVIEW + NBS + LIQUID + CONCENTRATION + HPIS + SCINTILLATION

077945
MAWSON CA + COWPER G
ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972
ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER
AECL-4272 +. 32 PAGES, 3 FIGURES, SEPTEMBER 1972

EFFLUENTS AND NEARBY NATURAL WATERS WERE MONITORED FOR RADIONUCLIDES. A METHOD FOR DETERMINATION OF LOW LEVELS OF STABLE COBALT WAS DEVELOPED. STUDIES WERE INITIATED ON RADIOACTIVE AND STABLE SR IN LAKE SEDIMENT, ON THE TRITIUM INPUT TO A LAKE VIA GROUND WATER, AND OF THE ROLE OF TRITIUM RETENTION BY SOIL ON THE EVAPORATION OF TRITATED WATER FROM ECOSYSTEMS. UPTAKE OF PHOSPHATE AND FERRIC IONS BY AQUATIC PLANTS OCCURRED THROUGH THE ROOTS, EVEN IN FLOATING SPECIES WITH SUBMERGED ABSORBENT LEAVES. MONITORING METHODS WERE DEVELOPED FOR T AND I IN AIR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + COBALT + IODINE + MONITOR, LIQUID + STRONTIUM + TRACER, RADIOACTIVE + SURFACE WATER, NUCLIDE OCCURRENCE + GROUND WATER, NUCLIDE OCCURRENCE + IRON + PHOSPHATE + SOIL, NUCLIDE OCCURRENCE + CRITICAL NUCLIDE PATHWAY + *CHALK RIVER + METEOROLOGY + WATER POLLUTION + MONITORING PROGRAM, ENVIRONMENTAL + LAKE + *RADIONUCLIDE UPTAKE + *ECOSYSTEM, AQUATIC + RADIONUCLIDE TRANSFER + SEDIMENT + INSECT + RADIATION MONITORS + INSTRUMENTS, MISC.

079785
OCHIAI T + KAWASAKI H
TRITIUM IN THE GROUNDWATER IN JAPAN
AGRICULTURAL ENGINEERING RESEARCH STATION, HIRATSUKA, JAPAN
7 PAGES, YOSUI TO HAISUI, 14(3), PP. 255-261 (MARCH 1972)

THE FOLLOWING METHODS FOR MEASURING TRITIUM ARE DESCRIBED - MEASUREMENTS BY LIQUID SCINTILLATION OF WATER SAMPLES; MEASUREMENT OF GAS SAMPLES BY A GAS PROPORTIONAL COUNTER; AND MEASUREMENT OF GAS SAMPLES BY AN IONIZATION CHAMBER. THE MERITS AND DEMERITS OF THE METHODS ARE DISCUSSED.

*GROUND WATER + *MEASUREMENT + *WATER + SAMPLING + *GROUND WATER, NUCLIDE OCCURRENCE + GAS + *CONCENTRATION

081436
MEYER HE + ROBINSON B + BROWN R, ET AL.
A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE
MOUND LABORATORY, MIAMISBURG, OHIO
MLM-2015 +. 22 PAGES, 10 FIGURES, 7 REFERENCES, APRIL 6, 1973

THE INSTRUMENT DESCRIBED IN THIS INTERIM DEVELOPMENT REPORT IS AN OPERATIONAL, PRACTICAL, RUGGEDIZED, ULTRASENSITIVE, TRITIUM FIELD AIR SAMPLER ASSEMBLED FOR THE SIMULTANEOUS, DIFFERENTIAL SAMPLING OF THE ENVIRONMENTAL AIR FOR TRITIUM OXIDE AND ELEMENTAL TRITIUM. THE DETECTION SENSITIVITY APPROACHES TRITIUM BACKGROUND LEVELS. THIS SENSITIVITY IS ACHIEVED BY HIGH VOLUME SAMPLING, EFFICIENT REMOVAL OF TRITIUM OXIDE AND ELEMENTAL TRITIUM, AND COUNTING THE RECOVERED FRACTIONS BY LIQUID SCINTILLATION SPECTROMETRY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ATMOSPHERIC POLLUTION + *INSTRUMENT, AIR SAMPLING + *AIR + MOUND LABORATORY + MONITORING SYSTEM, RADIATION + *CONCENTRATION + SPECTROMETRY + RADIATION MONITORS

081629
BRADLEY AE + WILLES EH
A RISETIME DISCRIMINATOR FOR LOW LEVEL TRITIUM COUNTING
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
9 PAGES, 6 TABLES, 5 FIGURES, IEEE TRANSACTIONS ON NUCLEAR SCIENCE, NS-20(1), PP. 80-89 (FEBRUARY 1973)

DESCRIBES THE DESIGN OF A RISETIME DISCRIMINATOR CIRCUIT, WITH ASSOCIATED ANTICOINCIDENCE/COINCIDENCE LOGIC AND ITS APPLICATION TO THE COUNTING OF LOW-ACTIVITY TRITIUM SAMPLES IN GAS PROPORTIONAL COUNTER SYSTEMS. THE CIRCUITRY, PACKAGED IN A DOUBLE-WIDTH NIM, EXTRACTS SIGNAL RISETIME INFORMATION WHICH IS USED IN CONJUNCTION WITH THE OUTPUT OF AN ANNULAR GUARD COUNTER TO ELECTRONICALLY REJECT BACKGROUND COUNTS DUE TO HIGH ENERGY CHARGED PARTICLES (MU-MESONS), AND GAMMA-RAY PHOTONS.

*COUNTER + *DESIGN STUDY + INSTRUMENT, COMPONENT + EQUIPMENT DEVELOPMENT + RADIATION MONITORS

081594
EIGHTEENTH ANNUAL CONFERENCE ON BIOASSAY, ENVIRONMENTAL AND ANALYTICAL CHEMISTRY, OCT. 10-11, 1972, PROGRAM AND ABSTRACTS
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8014 +. 39 PAGES, 1972

FOURTEEN ABSTRACTS (OF 25) CONCERN ANALYSIS OF RADIONUCLIDES IN HUMANS OR ANIMALS; TEN ABSTRACTS CONCERN ANALYSIS OF WATER, SOIL, OR FRESHWATER AND MARINE BENTHIC ORGANISMS; AND ONE ABSTRACT CONCERNS THE PREPARATION OF ENVIRONMENTAL IMPACT STATEMENTS. THE RATIO OF THE TRITIUM SPECIFIC ACTIVITY IN THE ORGANIC OR RESIDUE FRACTION TO THAT IN FREE WATER WAS 5-10 FOR SOIL AND 1-1.2 FOR MILK. ACCUMULATIONS OF RADIONUCLIDES FROM NUCLEAR POWERPLANT DISCHARGES WERE LOCATED USING A SUBMERSIBLE NAI(TI) PROBE. IN ENVIRONMENTAL SAMPLES, REACTOR-PRODUCED AND ATMOSPHERIC-FALLOUT PU WERE DISTINGUISHED BY ALPHA SPECTROMETRIC DETERMINATION OF THE PU240/PU239 RATIO. HOWEVER, FOR DETECTION OF PU-AM IN LARGE SOIL SAMPLES (TO 1 KG), A TECHNIQUE USING LOW-ENERGY X RADIATION WAS ADVANTAGEOUS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIOMEDICAL + *PLUTONIUM + SURVEY, ENVIRONMENT + *SURFACE WATER, NUCLIDE OCCURRENCE + *ANALYTICAL TECHNIQUE + MONITOR, ENVIRONMENTAL + SOIL, NUCLIDE OCCURRENCE + SURFACE WATER, DISPOSAL MEDIA + RADIOCHEMICAL ANALYSIS + SPECTROMETRY, GAMMA + BIOCHEMICAL + COMMUNITY, BENTHIC + EXCRETION, URINE + KIDNEY + RADIATION MONITORS

082070
DEVELOPMENT OF A MONITOR FOR TRITIATED WATER VAPOR IN THE PRESENCE OF NOBLE GASES
ATOMIC ENERGY OF CANADA LTD. CHALK RIVER, ONTARIO
AECL-4303 +. 16 PAGES, 7 TABLES, 8 FIGURES, SEPTEMBER 1972

FISSION-PRODUCT NOBLE GASES OR AR-41 OFTEN ACCOMPANY TRITIATED WATER ESCAPING FROM REACTOR SYSTEMS. WHEN THE CONCENTRATIONS OF GASES ARE MORE THAN TWO ORDERS ABOVE THAT OF THE TRITIATED WATER VAPOUR, GAS-PHASE MONITORS (E.G. IONIZATION CHAMBERS) ARE IMPRACTICAL. THE PRINCIPLES OF A MONITOR FOR HTO VAPOR IN THESE CONDITIONS WERE OUTLINED RECENTLY. AN HTO-VAPOR/WATER EXCHANGER IS USED WITH PLASTIC OR LIQUID SCINTILLATOR AS DETECTOR FOR TRITIATED WATER IN A SINGLE SAMPLE TYPE LIQUID SCINTILLATION COUNTER. NOBLE GASES ARE VERY INEFFICIENTLY TRAPPED, RELATIVE TO HTO VAPOR, IN THE WATER.

AVAILABILITY - SCIENTIFIC DOCUMENT DISTRIBUTION OFFICE, ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO, CANADA

FISSION PRODUCT RELEASE + NOBLE GAS + *CHALK RIVER + *MONITOR + *WATER VAPOR

082302
OSBORNE RV
ENVIRONMENTAL MONITORING TECHNIQUES
CHALK RIVER NUCLEAR LABORATORIES, ONTARIO, CANADA
60 PAGES, PP. 496-556 OF *TRITIUM*, PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

DISCUSSES SUCH TOPICS AS MONITORING REACTOR EFFLUENTS, ANALYTICAL TECHNIQUES, MONITORING IN AQUATIC ENVIRONMENT AND SUBSEQUENT ANALYSIS OF TRITIUM IN WATER, A METHOD FOR AIR AND GAS SAMPLING, STACK MONITOR, AND A MONITOR FOR NATURAL GAS FROM NUCLEAR STIMULATION.

MONITOR, STACK + PLOWSHARE + *WATER + MONITOR, GAS + *SAMPLING + AIR + *ANALYTICAL TECHNIQUE + *MONITOR, ENVIRONMENTAL + MONITOR, AREA + GAS + STIMULATION + HPIS

082850
PAVLICSEK I + VERES A + RAKVACSNE SO
MEASUREMENT OF TRITIUM CONCENTRATION OF NATURAL WATERS
MTA IZOTOP INTEZETE, BUDAPEST
7 PAGES, IZOTOPTECHNIKA, 15(12), PP. 619-625 (DECEMBER 1972)

082850 *CONTINUED*
THE PREPARATION AND DISTILLATION ENRICHMENT OF WATER SAMPLES ARE DESCRIBED. ACTIVITY MEASUREMENTS BY MEANS OF SCINTILLATION SPECTROMETRY ARE DISCUSSED. (IN HUNGARIAN)

*MEASUREMENT + *WATER + SAMPLING + EVAPORATION + *CONCENTRATION + SPECTROMETRY

085814
NOAKES JE + NEARY MP + SPAULDING JD
TRITIUM MEASUREMENTS WITH A NEW LIQUID SCINTILLATION COUNTER
UNIVERSITY OF GEORGIA, ATHENS
11 PAGES, 7 TABLES, 14 FIGURES, 7 REFERENCES, NUCLEAR INSTRUMENTS AND METHODS, 109(1), PP. 177-187 (MAY 15, 1973)

A NEW CONCEPT IN LIQUID SCINTILLATION COUNTING HAS BEEN EMPLOYED IN DEVELOPING AN INSTRUMENT FOR THE PURPOSE OF QUANTITATIVELY MEASURING LOW SPECIFIC ACTIVITY TRITIUM SAMPLES. THE INSTRUMENT DESIGN DIFFERS FROM PRESENT COMMERCIAL INSTRUMENTATION IN THAT IT UTILIZES ELECTRONICS THAT MEASURE FAST-PULSE TIME INTERVALS RATHER THAN PERFORMING PULSE HEIGHT ANALYSIS. DIRECT COUNTING OF AQUEOUS COCKTAILS CAN BE ACCOMPLISHED TO SENSITIVITY LEVELS BELOW 10 T.U. TRITIATED BENZENE SAMPLES OF 25 ML VOLUME HAVE BEEN COUNTED AT 53% COUNTING EFFICIENCY WITH BACKGROUND COUNT RATES CONTRIBUTING LESS THAN 1.75 C/M.

COUNTER + MEASUREMENT + EQUIPMENT DESIGN + INSTRUMENT, PULSE + INSTRUMENT, OPTICAL + LUMINARY

089573
GIRTON RC + PENCE DT + KAKEY LT
THE STACK MONITOR SYSTEM AT THE IDAHO CHEMICAL PROCESSING PLANT
ALLIED CHEMICAL, NATIONAL REACTOR TESTING STATION
ICP-1034 +. 30 PAGES, 1 TABLE, 6 FIGURES, 8 REFERENCES, SEPTEMBER 1973

THE EFFLUENT MONITORING SYSTEM USED TO MEASURE AIRBORNE PARTICULATE EMISSIONS FROM THE IDAHO CHEMICAL PROCESSING PLANT IS DESCRIBED IN DETAIL. THE EFFICIENCY OF THE SYSTEM HAS BEEN EVALUATED THROUGH STUDIES OF PARTICLE MIGRATION AS A FUNCTION OF SIZE, PARTICULATE PLATEOUT, PARTICLE SIZE DISTRIBUTION, TYPE OF FILTER PAPER, FLOW RATES, AND THE HOMOGENEITY OF THE GASEOUS EFFLUENTS. SEVERAL DEFICIENCIES OF THE SYSTEM HAVE BEEN IDENTIFIED AND RECOMMENDATIONS FOR IMPROVEMENT TO MEET PRESENT AND ANTICIPATED POLLUTION REGULATIONS ARE PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DEPOSITION + KRYPTON + MONITOR, STACK + *NRTS + PARTICLE SIZE + RUTHENIUM + *MONITOR, AIR + ORGANIC IODIDE + HELIUM + PARTICLE SIZE DISTRIBUTION + RADIOCHEMICAL PROCESSING + *MONITORING SYSTEM, RADIATION + MONITORING PROGRAM, ENVIRONMENTAL + JACOBS

090669
COLMENARES C + SHAPIRO EG + BARRY PE
A EUROPIUM-DOPED, CALCIUM-FLUORIDE SCINTILLATOR SYSTEM FOR LOW-LEVEL TRITIUM DETECTION
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
13 PAGES, 3 TABLES, 13 FIGURES, 16 REFERENCES, NUCLEAR INSTRUMENTS & METHODS, 114(2), PP. 277-289 (JANUARY 15, 1974)

AN IN-LINE DETECTOR AND ELECTRONIC SYSTEM FOR LOW-LEVEL TRITIUM DETECTION HAVE BEEN BUILT AND TESTED. TRITIUM BETAS ARE DETECTED WITH A EUROPIUM-DOPED CALCIUM-FLUORIDE CAF2(EU) SCINTILLATOR-PHOTOMULTIPLIER COMBINATION. AN INEXPENSIVE, FULLY INTEGRATED CIRCUIT, AMPLIFYING PULSE SHAPE ANALYZER, WAS DESIGNED AND BUILT FOR DETECTING LOW-LEVEL SIGNALS IN THE PRESENCE OF PHOTOTUBE NOISE AND COSMIC RAY OVERLOADS. THE AMPLIFYING PULSE SHAPE ANALYZER PERFORMS SIGNAL POST-AMPLIFICATION AND -SHAPING, PULSE SHAPE DISCRIMINATION, AND SINGLE CHANNEL ENERGY ANALYSIS. THE SYSTEM IS IDEALLY SUITED FOR COMPUTER MONITORING AND CONTROLLING OF TRITIUM-CONTAMINATED GAS STREAMS. A DETAILED DESCRIPTION IS PRESENTED.

DESIGN STUDY + INSTRUMENT, COMPONENT + INSTRUMENT, SURVEILLANCE + EUROPIUM + COMPONENT DESCRIPTION

092878
KUMAR R + PANEK AF + RAUE DJ
CONTINUOUS MONITORS FOR TRITIUM IN SODIUM COOLANT AND COVER GAS OF AN LMFBR
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8079 +. 20 PAGES, 5 TABLES, 14 FIGURES, 12 REFERENCES, MARCH 1974

CONTINUOUS MONITORS FOR TRITIUM IN THE SODIUM COOLANT AND THE COVER GAS OF A FAST BREEDER REACTOR HAVE BEEN DEVELOPED. THE SENSOR FOR THE MONITORS CONSISTS OF A THIN NICKEL MEMBRANE WHICH PERMITS THE DIFFUSION OF TRITIUM INTO AN ARGON SWEEP GAS CONTAINING 1 TO 5% HYDROGEN. THE TRITIUM CONTENT OF THE SWEEP GAS LEAVING THE SENSOR IS DETERMINED BY DISINTEGRATION-RATE COUNTING IN AN IONIZATION CHAMBER. THE MONITORS FOR SODIUM ARE SENSITIVE TO 0.04 NCI OF TRITIUM/G OF SODIUM (1 CURIE = 2.06 X 10(EXP 19) ATOMS OF TRITIUM); FOR THE COVER GAS MONITORS, THE SENSITIVITY LEVEL IS 0.6 X 10(EXP 11) ATOMS OF TRITIUM/LITER OF GAS. FOR COMPARISON, THE TYPICAL TRITIUM CONTENT OF THE PRIMARY SODIUM IN EBR-II IS 50 NCI/G, AND IN THE PRIMARY COVER GAS IT IS 3 X 10(EXP 12) ATOMS/LITER.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION: SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

092878 *CONTINUED*
HYDROGEN + SODIUM + *MONITOR, GAS + REACTOR COOLANT + COVER GAS + COOLANT CHEMISTRY + *MONITOR + REACTOR, LMFBR

093596
CAMPBELL DA + LOCANTE J
METHOD FOR DETERMINING REACTOR COOLANT SYSTEM LEAKAGE
U.S. PATENT 3,712,850 +. 6 PAGES, JANUARY 23, 1973

INDIRECT AND DIRECT METHODS ARE PROVIDED FOR DETERMINING LEAKAGE FROM A REACTOR COOLANT SYSTEM INSIDE THE REACTOR CONTAINMENT. THE INDIRECT METHOD RELIES ON THE COMPARISON OF QUANTITATIVE MEASUREMENTS OF A TRACER, SUCH AS TRITIUM, IN THE REACTOR COOLANT TO THE TRACER IN THE CONDENSATE COLLECTED BY THE CONTAINMENT COOLING COILS TO DETERMINE WHAT PART OF THE TOTAL COLLECTION, REPRESENTING ALL LEAKAGE, IS DERIVED FROM THE REACTOR COOLANT SYSTEM. THE DIRECT METHOD RELIES ON MEASUREMENTS OF RADIOACTIVITY PRODUCED BY SHORT HALF-LIVED NOBLE GAS ISOTOPES.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

*MEASUREMENT + *REACTOR COOLANT + TRACER, GAS + TRACER + UNITED STATES + PATENT + MAIN COOLING SYSTEM + *LEAK RATE

094457
HADZISEHOVIC M + MOCILNIK I + BEK-UZAROV DJ
INTERNAL GAS COUNTING METHOD FOR ABSOLUTE MEASUREMENTS OF THE SPECIFIC RADIOACTIVITY OF TRITIATED WATER
BORIS KIDRIC INSTITUTE, BELGRADE, YUGOSLAVIA
3 PAGES, 3 FIGURES, 3 REFERENCES, NUCLEAR INSTRUMENTS & METHODS, 112(1-2), PP. 69-71 (SEPTEMBER-OCTOBER 1973)

THIS PAPER PRESENTS THE RESULTS OF ABSOLUTE DETERMINATION OF THE SPECIFIC RADIOACTIVITY OF TRITIATED WATER, ON THE BASIS OF THE MEASURED DISINTEGRATION RATE OF TRITIUM BY THE INTERNAL GAS COUNTING METHOD. THE SPECIFIC RADIOACTIVITY OF WATER IS FOUND IN TWO WAYS, (DEPENDING ON THE MANNER OF DETERMINING THE MASS OF THE RADIOACTIVE HYDROGEN) WHICH GIVE THE SAME RESULT WITHIN THE LIMITS OF 0.3%. THE TOTAL ERROR IN THE DETERMINATION OF SPECIFIC RADIOACTIVITY IS PLUS OR MINUS 1%.

*COUNTER + *GAS + RADIATION MONITORS

094614
SHEEHAN WE + CURTIS ML
NEW APPROACH TO TRITIUM LEAK RATE DETERMINATION
MOUND LABORATORY, MIAMISBURG, OHIO
4 PAGES, 3 FIGURES, IEEE TRANS. ON NUCLEAR SCIENCE, NS-21(1), PP. 522-525 (FEBRUARY 1974)

A METHOD FOR DETERMINING LEAK RATES (ON THE ORDER OF 1 X 10(-17) CM(3)/SEC AND HIGHER) FROM CONTAINERS OF TRITIUM WASTE IS DESCRIBED. EACH CONTAINER IS SEALED IN A DISPOSABLE CAN. AFTER SEVERAL DAYS, THE ACCUMULATED TRITIUM IS FLUSHED FROM THE CAN WITH COMPRESSED AIR THROUGH AN ETHYLENE-GLYCOL BUBBLER WHERE THE HTO, BUT NOT THE HT, IS TRAPPED. THE OUTPUT OF THE BUBBLER IS CHANNELED THROUGH A HEATED PALLADIUM CATALYST WHERE THE HT IS OXIDIZED. THE OXIDIZED HT IS COLLECTED IN A SECOND ETHYLENE-GLYCOL BUBBLER. THE TRITIUM COLLECTED IN BOTH BUBBLERS IS MEASURED BY LIQUID SCINTILLATION COUNTING.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

MEASUREMENT + *LEAK RATE

094616
OSTLUND HG
A SAMPLING SYSTEM FOR ATMOSPHERIC HT AND HTO
UNIVERSITY OF MIAMI, FLORIDA
3 PAGES, 3 FIGURES, IEEE TRANS. ON NUCLEAR SCIENCE, NS-21(1), PP. 510-512 (FEBRUARY 1974)

A SYSTEM IS BRIEFLY DESCRIBED, WHICH IS DESIGNED FOR THE SAMPLING OF TRITIUM GAS (HT AND T SUB 2) AND TRITIATED WATER VAPOR IN THE AIR AT LEVELS FAR BELOW MPC AND DOWN TO PRESENT-DAY ATMOSPHERIC BACKGROUND LEVELS. THE TRITIUM GAS IS EXTRACTED FROM THE AIR BY CATALYTIC COMBUSTION ON PD AT AMBIENT TEMPERATURE. THE RESULTANT WATER IS ABSORBED ON MOLECULAR SIEVE CARRYING THE PD. THE SYSTEM IS WELL SUITED FOR FIELD WORK. PRESENT-DAY WORLD-WIDE HT LEVELS ARE ABOUT 2.3 PCI/KG AIR, AND THE HTO LEVELS ABOUT THE SAME IN THE TROPOSPHERE.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

*INSTRUMENT, AIR SAMPLING + MONITOR, SAMPLING

094649
SINGH AN + KADWANI MG
A SENSITIVE DETECTOR SYSTEM FOR THE CONTINUOUS MONITORING OF TRITIUM IN THE AIR.
BHABHA ATOMIC RESEARCH CENTRE, BOMBAY, INDIA
6 PAGES, 8 FIGURES, IEEE TRANS. ON NUCLEAR SCIENCE, NS-21(1), PP. 188-193 (FEBRUARY 1074)

094649 *CONTINUED*

A NEW DESIGN OF A FLOW CELL TYPE OF SCINTILLATION DETECTOR SYSTEM SUITABLE FOR CONTINUOUS MONITORING OF TRITIUM IN THE AMBIENT AIR HAS BEEN DEVELOPED. THE DETECTOR RECORDS 2500 COUNTS PER SECOND WITH A SINGLE PHOTOMULTIPLIER TUBE FOR 1 MPC LEVEL OF TRITIUM ACTIVITY RELEASE AT 50 COUNTS PER SECOND BACKGROUND AND 2.5% COUNTING EFFICIENCY. POSSIBILITY OF DESIGNING DETECTORS WITH AN EFFICIENCY, COMPARABLE TO THAT OF LIQUID SCINTILLATORS, HAS BEEN DISCUSSED. THE PERFORMANCE OF THE DETECTOR HAS BEEN STUDIED IN DETAIL AND A COMPLETE TRITIUM MONITORING SETUP HAS BEEN DESCRIBED.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

COUNTER + *INSTRUMENT, COMPONENT + *MONITOR + MONITORING SYSTEM, RADIATION + SCINTILLATION

094798
RHINEHAMMER TB + LAMBERGER PH
TRITIUM CONTROL TECHNOLOGY
MOUND LABORATORY, MIAMISBURG, OHIO
WASH-1269 +. 530 PAGES, FIGURES, DECEMBER 1973

THE PURPOSE OF THIS REPORT IS TO ASSEMBLE IN AN UNCLASSIFIED COMPENDIUM PERTINENT AEC CONTRACTOR AND PRIVATE INDUSTRY OPERATING EXPERIENCE WITH TRITIUM CONTAINMENT AND HANDLING, MONITORING, TRAPPING AND REMOVAL, AND STORAGE AND DISPOSAL SYSTEMS. THIS REPORT EMPHASIZES THE CAPABILITIES AND LIMITATIONS OF EXISTING TECHNOLOGY AND OPERATING TRITIUM CONTROL SYSTEMS AND DOES NOT DISCUSS CURRENT OR PROPOSED RESEARCH AND DEVELOPMENT PROGRAMS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

WASTE HANDLING + WASTE STORAGE + WASTE DISPOSAL, GAS + MONITORING SYSTEM, RADIATION + OPERATING EXPERIENCE + JACOBS

096158
SHEEHAS WE + CURTIS ML
NEW APPROACH TO TRITIUM LEAK RATE DETERMINATION
MOUND LAB., MIAMISBURG, OHIO
MLM-2087(OP) + CONF-731112-8 +. 10 PAGES, PRESENTED AT THE NUCLEAR SCIENCE SUMPOSIUM, HELD IN SAN FRANCISCO, CALIFORNIA, NOV. 14, 1973

A METHOD FOR DETERMING LEAK REATE (ON THE ORDER OF 1 X 10(EXP -17) CUBED CM/SEC AND HIGHER) FROM CONTAINERS OF TRITIUM WASTE IS DESCRIBED. EACH CONTAINER IS SEALED IN A DISPOSABLE CAN. AFTER SEVERAL DAYS, THE ACCUMULATED TRITIUM IS FLUSHED FROM THE CAN WITH COMPRESSED AIR THROUGH AN ETHYLENE-GLYCOL BUBBLER WHERE THE HTO, BUT NOT THE HT, IS TRAPPED. THE OUTPUT OF THE BUBBLER IS CHANNELED THROUGH A HEATED PALLADIUM CATALYST WHERE THE HT IS OXIDIZED. THE OXIDIZED HT IS COLLECTED IN A SECOND ETHYLENE-GLYCOL BUBBLER. THE TRITIUM COLLECTED IN BOTH BUBBLERS IS MEASUED BY LIQUID SCINTILLATION COUNTING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COUNTER + MEASUREMENT + WASTE HANDLING + MONITOR + LEAK RATE + SCINTILLATION

096879
WEBER KH + KUNZE J
CONSTRUCTION OF A SIMPLE TRITIUM MONITOR AND A TRITIUM AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-RAY DOSIMETERS
3 PAGES, 3 FIGURES, KERNENERGIE, 17(2), PP. 59-61 (FEBRUARY 1974)

A SIMPLE TRITIUM MONITOR AND A DEVICE FOR TESTING LEAK RATES OF GLASS AMPOULES HAVE BEEN CONSTRUCTED FOR WARRANTING RADIATION PROTECTION IN WORKS WITH GASEOUS TRITIUM, IN PARTICULAR IN MANIPULATING TRITIUM-FILLED GLASS AMPOULES. AN OPEN-AIR IONIZATION CHAMBER FOR THE MONITOR AND A HERMETICALLY SCALABLE IONIZATION CHAMBER FOR THE LEAK TESTER HAVE BEEN USED AS THE DETECTORS. MEASUREMENTS OF THE IONIZATION CURRENT ARE MADE BY MEANS OF A SOMEWHAT MODIFIED X-RAY GAMMA-RAY DOSIMETER VA-J-15/15A. THE MINIMUM DETECTABLE ACTIVITY CONCENTRATION RELATIVE TO FOUR-FOLD BACKGROUND IS 10(EXP -8) CI/L., AND THE MINIMUM DETECTABLE LEAKAGE RATE IS 10(EXP -9) CI/HR. AT A PERIOD OF 24 HR. FOR ONE TEST.

*CHAMBER, ION + INSTRUMENT, NUCLEAR + TESTING + *MONITOR + LEAK RATE + *EQUIPMENT DEVELOPMENT + RADIATION MONITORS

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

ABSORPTION
064018 P 23 068112 P 25
ACCELERATOR
021668 P 10
ACTIVITY BUILDUP
030689 P 15
ADMINISTRATIVE CONTROL
007577 P 2 014861 P 9
ADSORPTION
008150 P 3 021994 P 10
AECL
068112 P 25
AEROSOL
025597 P 12
AEROSOL, RADIOACTIVE
008568 P 3 031431 P 15
AGENCY, AEC
025597 P 12 075963 P 28
AIR
007577 P 2 013772 P 5 013775 P 5 013776 P 5
013777 P 6 013778 P 6 013779 P 6 013780 P 6
013781 P 6 013782 P 7 013783 P 7 013784 P 7
026278 P 13 028723 P 14 029220 P 14 031431 P 15
037365 P 17 043804 P 20 064768 P 24 073286 P 27
077164 P 29 081436 P 30 082302 P 31
AIRBORNE RELEASE
027976 P 13 055111 P 21 057549 P 22
AIRCRAFT
025597 P 12 037365 P 17
AMERICIUM
007852 P 2
ANALYTICAL TECHNIQUE
005383 P 1 005771 P 1 006958 P 1 007577 P 2
007852 P 2 008150 P 3 008709 P 4 013367 P 5
013772 P 5 013794 P 7 013795 P 8 013796 P 8
013806 P 8 013925 P 8 016975 P 9 017268 P 9
021994 P 10 023269 P 11 026278 P 13 028723 P 14
029220 P 14 030136 P 14 030394 P 15 030689 P 15
037365 P 17 037759 P 17 040000 P 17 040773 P 18
040774 P 18 040792 P 18 041898 P 19 043089 P 19
044996 P 20 055111 P 21 056432 P 21 057549 P 22
061936 P 23 063405 P 23 066056 P 24 069312 P 25
070062 P 26 070252 P 26 070255 P 26 075312 P 28
077129 P 28 077198 P 30 081594 P 31 082302 P 31
ANIMAL
016938 P 9 052185 P 21 075281 P 28
ANIMAL, FISH
066272 P 24
ANIMAL, VERTEBRATE
064768 P 24
ANTIMONY
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7
ARGON
063405 P 23 077129 P 28
ASSIMILATION
075281 P 28
ATMOSPHERIC DIFFUSION
042995 P 19
ATMOSPHERIC DIFFUSION EXPERIMENT
061201 P 22 074336 P 27
ATMOSPHERIC DIFFUSION, CLIMATOLOGY
025597 P 12
ATMOSPHERIC DIFFUSION, GLOBAL
025597 P 12
ATMOSPHERIC POLLUTION
042995 P 19 043804 P 20 070255 P 26 081436 P 30
ATMOSPHERIC STABILITY
025597 P 12
BARIUM
005771 P 1 013775 P 5 013776 P 5 013777 P 6
013778 P 6 013779 P 6 013780 P 6 013781 P 6
013782 P 7 013783 P 7 013784 P 7
BATTELLE NORTHWEST
036537 P 16
BENEFICIAL USE
030136 P 14
BETA EMITTER
021195 P 10 030464 P 15 037755 P 17 064263 P 23
BIBLIOGRAPHY
042769 P 19 075963 P 28
BIOACCUMULATION/TURNOVER
066272 P 24
BIOCHEMICAL
081594 P 31
BIOLOGICAL CONTROL
063489 P 23 075281 P 28 077191 P 29
BIOMEDICAL
016938 P 9 036537 P 16 055111 P 21 066272 P 24
075281 P 28 081594 P 31
BIOTA
005771 P 1
BODY BURDEN
056432 P 21
BUBBLE
028723 P 14 036224 P 16
CADMIUM
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 025597 P 12
CALCIUM
005771 P 1
CALIBRATION
030394 P 15 030689 P 15 057549 P 22 063405 P 23
CANADA
021994 P 10 024740 P 12
CARBON
007852 P 2 025597 P 12 030136 P 14 030464 P 15
036224 P 16 038591 P 17 040773 P 18 040774 P 18
052185 P 21 070063 P 26 077129 P 28 077172 P 29
CATALYST
064018 P 23
CEPIUM
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 025597 P 12
CESIUM
004811 P 1 007852 P 2 013775 P 5 013776 P 5
013777 P 6 013778 P 6 013779 P 6 013780 P 6
013781 P 6 013782 P 7 013783 P 7 013784 P 7
025597 P 12 070063 P 26 077945 P 30
CHALK RIVER
006997 P 2 008679 P 3 008680 P 4 021994 P 10
024740 P 12 066272 P 24 068112 P 25 077945 P 30
082070 P 31
CHAMBER
036224 P 16
CHAMBER, ION
028723 P 14 096879 P 34
CHARCOAL
031431 P 15
CHEMICAL ANALYSIS
052185 P 21
CHROMATOGRAPHY
023269 P 11 030129 P 14 077129 P 28
CLADDING
061489 P 22
COBALT
077945 P 30
CODES AND STANDARDS
051100 P 21 077198 P 30
COMBUSTION
040773 P 18
COMMUNITY, BENTHIC
081594 P 31
COMPARISON
041898 P 19 041955 P 19 070252 P 26
COMPARISON, THEORY AND EXPERIENCE
074336 P 27
COMPONENT DESCRIPTION
090669 P 32
CONCENTRATION
013794 P 7 016938 P 9 021994 P 10 024740 P 12
026278 P 13 027925 P 13 029220 P 14 031396 P 15
037365 P 17 038591 P 17 040479 P 18 042769 P 19
061936 P 23 064018 P 23 064263 P 23 066056 P 24
068572 P 25 070063 P 26 070255 P 26 073286 P 27
077164 P 29 077172 P 29 077198 P 30 079785 P 30
081436 P 30 082850 P 31
CONCENTRATION, MAXIMUM
061201 P 22
CONDENSATION
030129 P 14 068112 P 25

CONSUMER PRODUCT
040773 P 18
CONTAINMENT
077191 P 29
CONTAINMENT FILTERING SYSTEM
014861 P 9
CONTAINMENT INSTRUMENTATION
075312 P 28
CONTAINMENT LEAK MONITOR
075312 P 28
CONTAMINATION
006997 P 2 021195 P 10 021668 P 10 024192 P 11
042995 P 19
COOLANT CHEMISTRY
092878 P 32
COSMIC RADIATION
025597 P 12
COST, OPERATING
068112 P 25
COUNTER
007416 P 2 011470 P 4 013347 P 5 013772 P 5
013794 P 7 013795 P 8 013806 P 8 016938 P 9
016975 P 9 017268 P 9 021668 P 10 028723 P 14
030394 P 15 036224 P 16 036537 P 16 037365 P 17
037755 P 17 037759 P 17 038591 P 17 040773 P 18
040774 P 18 042769 P 19 044996 P 20 064263 P 23
069312 P 25 074953 P 27 077164 P 29 077165 P 29
077198 P 30 081629 P 31 085814 P 32 094457 P 33
094649 P 33 096158 P 34
COVER GAS
092878 P 32
CRITICAL NUCLIDE PATHWAY
075281 P 28 075312 P 28 077945 P 30
CRUD
061489 P 22
CRUSTACEAN
004811 P 1 017268 P 9
CVTR (PWR)
023868 P 11
DATA COLLECTION
077191 P 29
DATA PROCESSING
070249 P 26 070252 P 26
DECONTAMINATION
007577 P 2 011130 P 4 016938 P 9 024192 P 11
024286 P 11 042995 P 19
DEPOSITION
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 030129 P 14 070255 P 26
089573 P 32
DESIGN CRITERIA
043804 P 20 064263 P 23 074953 P 27 077165 P 29
DESIGN STUDY
036224 P 16 081629 P 31 090669 P 32
DESORPTION
009238 P 4
DEUTERIUM
075281 P 28
DIDO (TR)
025984 P 12
DIFFUSION
030129 P 14
DILUTION
030129 P 14
DISPERSION
030129 P 14 033384 P 16
DISTRIBUTION
075281 P 28
DOSE
017268 P 9
DOSE CALCULATION, EXTERNAL
056432 P 21
DOSE CALCULATION, INTERNAL
061931 P 22 075312 P 28
DOSE MEASUREMENT, EXTERNAL
041898 P 19 056070 P 21 056432 P 21
DOSE MEASUREMENT, INTERNAL
029220 P 14
DOSIMETRY
006997 P 2 007577 P 2 013775 P 5 013776 P 5
013777 P 6 013778 P 6 013779 P 6 013780 P 6
013781 P 6 013782 P 7 013783 P 7 013784 P 7
066272 P 24
DOSIMETRY, THERMOLUMINESCENCE
066272 P 24
ECOLOGY
004811 P 1 016938 P 9 017268 P 9
ECONOMICS
007852 P 2
ECOSYSTEM, AQUATIC
066272 P 24 077945 P 30
EFFECT, GENETIC
066272 P 24
EFFECT, SOMATIC
066272 P 24
EFFLUENT
033384 P 16 036925 P 16 061410 P 22 066272 P 24
068112 P 25 069312 P 25 073286 P 27 077129 P 28
077191 P 29
ELEMENTS AND ISOTOPES
070063 P 26
ELIMINATION
075281 P 28
ENERGY LEVEL
070252 P 26 077164 P 29 077165 P 29
ENERGY SPECTRUM
077172 P 29
ENVIRONMENT
030129 P 14 037365 P 17 038591 P 17 075312 P 28
077191 P 29
EQUIPMENT DESIGN
025984 P 12 037755 P 17 040773 P 18 040774 P 18
040792 P 18 063489 P 23 085814 P 32
EQUIPMENT DEVELOPMENT
081629 P 31 096879 P 34
EUROPIUM
070249 P 26 090669 P 32
EVAPORATION
030129 P 14 031431 P 15 082850 P 31
EXAMINATION
061489 P 22
EXCRETION
056432 P 21
EXCRETION, URINE
007577 P 2 007852 P 2 021994 P 10 029220 P 14
064768 P 24 081594 P 31
EXPANSION
061489 P 22
EXPERIMENT
030136 P 14
EXPOSURE, BACKGROUND
064768 P 24 075312 P 28
FAILURE, FUEL ELEMENT
023868 P 11
FALLOUT
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 025597 P 12 070249 P 26
070255 P 26
FILTER SYSTEM
008568 P 3
FILTERS
007416 P 2 028723 P 14 070249 P 26
FISSION GAS RELEASE
061489 P 22
FISSION PRODUCT RELEASE
043089 P 19 070249 P 26 082070 P 31
FISSION PRODUCT, AIRBORNE
056432 P 21
FISSION PRODUCT, IODINE
063405 P 23
FLAW
061489 P 22
FLOW
064263 P 23
FOOD
005771 P 1 038591 P 17
FRANCE
031431 P 15
FUEL BURNUP
061489 P 22
FUEL REPROCESSING
024192 P 11 030129 P 14 061410 P 22 073286 P 27
FUEL ROD
061489 P 22
GAMMA EMITTER
041955 P 19 070249 P 26
GAS
023269 P 11 028723 P 14 030136 P 14 038591 P 17
064263 P 23 068572 P 25 070249 P 26 077129 P 28
079785 P 30 082302 P 31 094457 P 33
GEOLOGY
040000 P 17
GERMANY
008568 P 3 013347 P 5 013795 P 8 031396 P 15
GI TRACT
075281 P 28
GROSS ALPHA
005771 P 1 007416 P 2 007577 P 2 007852 P 2
GROSS BETA
005383 P 1 005771 P 1 007416 P 2 007577 P 2

007852 P 2
GROSS GAMMA
007577 P 2 013775 P 5 013776 P 5 013777 P 6
013778 P 6 013779 P 6 013780 P 6 013781 P 6
013782 P 7 013783 P 7 013784 P 7
GROUND WATER
030129 P 14 040000 P 17 079785 P 30
GROUND WATER, NUCLIDE OCCURRENCE
013806 P 8 075312 P 28 077945 P 30 079785 P 30
GROUND WATER, TRACER
006958 P 1
HARWELL
025984 P 12
HAZARD, RELATIVE
043089 P 19 061931 P 22 077191 P 29
HEALTH PHYSICS TRAINING
016938 P 9 027976 P 13
HELIUM
089573 P 32
HPIS
077164 P 29 077165 P 29 077172 P 29 077191 P 29
077198 P 30 082302 P 31
HUMIDITY, RELATIVE
007680 P 2 075312 P 28
HYDROGEN
023269 P 11 028116 P 13 043804 P 20 074953 P 27
075281 P 28 092878 P 32
HYDROLOGY
013794 P 7 013796 P 8 016975 P. 9 030129 P 14
040000 P 17
IAEA
028116 P 13 070249 P 26 070252 P 26 070255 P 26
ICRP
031431 P 15
INHALATION
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 027976 P 13
INORGANIC
070063 P 26
INSECT
077945 P 30
INSTRUMENT CALIBRATION
005771 P 1 013775 P 5 013776 P 5 013777 P 6
013778 P 6 013779 P 6 013780 P 6 013781 P 6
013782 P 7 013783 P 7 013784 P 7 024591 P 12
064263 P 23
INSTRUMENT, ABNORMAL INDICATION
023868 P 11
INSTRUMENT, AIR SAMPLING
007416 P 2 008455 P 3 008568 P 3 011130 P 4
011470 P 4 036925 P 16 037365 P 17 049430 P 20
064018 P 23 074336 P 27 074953 P 27 077165 P 29
081436 P 30 094616 P 33
INSTRUMENT, COMPONENT
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 037755 P 17 037759 P 17
056070 P 21 081629 P 31 090669 P 32 094649 P 33
INSTRUMENT, FLOW
007416 P 2 037759 P 17 064263 P 23
INSTRUMENT, NUCLEAR
015267 P 9 096879 P 34
INSTRUMENT, OPTICAL
085814 P 32
INSTRUMENT, PULSE
085814 P 32
INSTRUMENT, SURVEILLANCE
049430 P 20 068572 P 25 090669 P 32
INSTRUMENT, TESTING
008680 P 4
INSTRUMENTS, MISC.
008709 P 4 009238 P 4 036537 P 16 043804 P 20
051081 P 20 051956 P 21 052185 P 21 061410 P 22
069312 P 25 077945 P 30
IODINE
008568 P 3 031431 P 15 036925 P 16 056432 P 21
061410 P 22 070249 P 26 077129 P 28 077945 P 30
ION EXCHANGE
075281 P 28
IRON
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 077945 P 30
ITALY
008709 P 4
JACOBS
030129 P 14 089573 P 32 094798 P 34
JAPAN
013925 P 8 038591 P 17 056432 P 21
KARLSRUHE
075312 P 28
KIDNEY
081594 P 31
KRYPTON
025597 P 12 030136 P 14 037759 P 17 057549 P 22
061410 P 22 064263 P 23 068572 P 25 077129 P 28
089573 P 32
LAKE
066272 P 24 077945 P 30
LASL
007577 P 2
LEAK RATE
093596 P 33 094614 P 33 096158 P 34 096879 P 34
LIQUID
005771 P 1 038591 P 17 040773 P 18 040792 P 18
052185 P 21 077198 P 30
LOW
069312 P 25
LRL
044996 P 20 069312 P 25
LUMINARY
085814 P 32
LUNG
056432 P 21 075281 P 28
MAIN COOLING SYSTEM
093596 P 33
MAINTENANCE AND REPAIR
008455 P 3
MAN
021994 P 10 024740 P 12 027925 P 13 029220 P 14
031396 P 15 064768 P 24 066272 P 24 075281 P 28
MANGANESE
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7
MATURE
064768 P 24
MEASUREMENT
021668 P 10 024192 P 11 031396 P 15 031431 P 15
038591 P 17 040000 P 17 042769 P 19 051081 P 20
061410 P 22 070063 P 26 070255 P 26 075281 P 28
077172 P 29 077191 P 29 077198 P 30 079785 P 30
082850 P 31 085814 P 32 093596 P 33 094614 P 33
096158 P 34
MESOSPHERE
025597 P 12
METABOLIC KINETICS
075281 P 28
METAL
008150 P 3
METEOROLOGICAL SUPPORT
013794 P 7
METEOROLOGY
016975 P 9 028116 P 13 061410 P 22 077945 P 30
MILITARY CONSIDERATION
023245 P 11 075963 P 28
MILK
005771 P 1 064768 P 24
MOLECULAR SIEVE
057549 P 22
MONITOR
007577 P 2 051956 P 21 066861 P 25 068112 P 25
075963 P 28 077198 P 30 082070 P 31 092878 P 32
094649 P 33 096158 P 34 096879 P 34
MONITOR, AIR
007416 P 2 007680 P 2 008455 P 3 008568 P 3
008679 P 3 008680 P 4 011130 P 4 011470 P 4
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 015267 P 9 023868 P 11
024740 P 12 030689 P 15 037365 P 17 037755 P 17
055111 P 21 063405 P 23 065252 P 24 068112 P 25
077164 P 29 077165 P 29 089573 P 32
MONITOR, AREA
043089 P 19 061931 P 22 073286 P 27 077164 P 29
082302 P 31
MONITOR, EMERGENCY
006997 P 2 007577 P 2 070249 P 26 070252 P 26
070255 P 26
MONITOR, ENVIRONMENTAL
005771 P 1 027976 P 13 044996 P 20 056432 P 21
061410 P 22 064768 P 24 065252 P 24 069312 P 25
070249 P 26 070252 P 26 070255 P 26 074953 P 27
077165 P 29 077191 P 29 081594 P 31 082302 P 31
MONITOR, GAS
023245 P 11 025984 P 12 031431 P 15 036925 P 16
037759 P 17 044996 P 20 049430 P 20 063405 P 23
063489 P 23 064263 P 23 065252 P 24 077129 P 28
082302 P 31 092878 P 32
MONITOR, GENERAL PRACTICE
007577 P 2

MONITOR, LIQUID
004811 P 1 023245 P 11 031431 P 15 040479 P 18
044996 P 20 055111 P 21 065252 P 24 068112 P 25
075312 P 28 077945 P 30
MONITOR, PERSONNEL
006997 P 2 007577 P 2 015267 P 9 027925 P 13
029220 P 14 040479 P 18 043089 P 19
MONITOR, SAMPLING
007416 P 2 011470 P 4 075312 P 28 094616 P 33
MONITOR, STACK
036925 P 16 065252 P 24 071338 P 27 073286 P 27
082302 P 31 089573 P 32
MONITOR, SURFACE
005383 P 1 008568 P 3 047841 P 20
MONITORING PROGRAM, ENVIRONMENTAL
028116 P 13 061936 P 23 066272 P 24 077945 P 30
089573 P 32
MONITORING SYSTEM, RADIATION
008568 P 3 040479 P 18 055111 P 21 057549 P 22
063405 P 23 063489 P 23 081436 P 30 089573 P 32
094649 P 33 094798 P 34
MOUND LABORATORY
081436 P 30
MPBB
007852 P 2 064768 P 24
MPC
007577 P 2 031431 P 15 056432 P 21 077129 P 28
077164 P 29
MPD
007577 P 2
NBS
077198 P 30
NEUTRON INTERACTION
040479 P 18
NEVADA TEST SITE
061931 P 22
NOBLE GAS
007416 P 2 036925 P 16 057549 P 22 082070 P 31
NRC REGULATORY GUIDE
077129 P 28
NRTS
089573 P 32
NS SAVANNAH (PWR)
014861 P 9
NUCLEAR DETONATION
070255 P 26 075312 P 28 077191 P 29
OCEAN AND SEA
030129 P 14 070063 P 26
OFF GAS
033384 P 16
OFF SITE
033384 P 16
ON SITE
068572 P 25
OPERATING EXPERIENCE
094798 P 34
ORGAN
052185 P 21
ORGANIC IODIDE
089573 P 32
OXIDE
021668 P 10 024192 P 11 026278 P 13 064768 P 24
074953 P 27 075281 P 28
OXYGEN
028116 P 13
PARTICLE
007416 P 2
PARTICLE SIZE
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 089573 P 32
PARTICLE SIZE DISTRIBUTION
089573 P 32
PARTICLE, RADIOACTIVE
070255 P 26
PATENT
093596 P 33
PERSONNEL EXPOSURE, RADIATION
006997 P 2 007577 P 2 009238 P 4 040479 P 18
042995 P 19 056432 P 21 061931 P 22 064768 P 24
068572 P 25
PERSONNEL PROTECTIVE DEVICE
006680 P 1 007577 P 2
PHOSPHATE
005771 P 1 077945 P 30
PHOSPHORUS
007852 P 2 040774 P 18 077172 P 29
PHYSIOLOGY/METABOLISM
042769 P 19 064768 P 24 066272 P 24
PLASTICS
066272 P 24
PLOWSHARE
030136 P 14 068572 P 25 077191 P 29 082302 P 31
PLUTO (TR)
025984 P 12
PLUTONIUM
007416 P 2 007852 P 2 013775 P 5 013776 P 5
013777 P 6 013778 P 6 013779 P 6 013780 P 6
013781 P 6 013782 P 7 013783 P 7 013784 P 7
081594 P 31
POLAND
047841 P 20
POLONIUM
007852 P 2
POPULATION EXPOSURE
030129 P 14 031396 P 15 061410 P 22 064768 P 24
066272 P 24
POTASSIUM
005771 P 1
POWER PLANT, NUCLEAR
077129 P 28
PRECIPITATION
028116 P 13
PRODUCTION
077191 P 29
PROMETHIUM
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7
PROPERTY, PHYSICAL
075281 P 28
PROTACTINIUM
007852 P 2
PROTEIN
040792 P 18
R AND D PROGRAM
056070 P 21
RADIATION EFFECT
016938 P 9 017268 P 9 077191 P 29
RADIATION EXPOSURE
056432 P 21
RADIATION EXPOSURE, CHRONIC
066272 P 24
RADIATION EXPOSURE, RECORD KEEPING
056432 P 21
RADIATION MONITORS
004811 P 1 005383 P 1 005771 P 1 006680 P 1
007416 P 2 008568 P 3 008679 P 3 008680 P 4
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 014861 P 9 016938 P 9
016975 P 9 021994 P 10 024740 P 12 027925 P 13
027976 P 13 030129 P 14 030689 P 15 031431 P 15
036224 P 16 037755 P 17 037759 P 17 040479 P 18
042995 P 19 047841 P 20 049430 P 20 056070 P 21
057549 P 22 063405 P 23 063489 P 23 065252 P 24
066272 P 24 068112 P 25 068572 P 25 070249 P 26
070252 P 26 071338 P 27 077164 P 29 077945 P 30
081436 P 30 081594 P 31 081629 P 31 094457 P 33
096879 P 34
RADIATION PROTECTION, ORGANIZATION
006997 P 2 007577 P 2 031396 P 15
RADIATION SAFETY AND CONTROL
007577 P 2 017268 P 9 027925 P 13 027976 P 13
030129 P 14 036537 P 16 042995 P 19 056432 P 21
061931 P 22 066056 P 24 068572 P 25 075963 P 28
RADIATION UNIT
007577 P 2
RADIOACTIVITY RELEASE
025597 P 12 030129 P 14 070249 P 26 073286 P 27
077191 P 29
RADIOBIOLOGY
036537 P 16
RADIOCHEMICAL ANALYSIS
006958 P 1 030136 P 14 030464 P 15 070063 P 26
070249 P 26 081594 P 31
RADIOCHEMICAL PLANT SAFETY
024192 P 11
RADIOCHEMICAL PROCESSING
089573 P 32
RADIOISOTOPE
017268 P 9 024192 P 11 031396 P 15 031431 P 15
077172 P 29
RADIOLOGICAL ASSISTANCE
027925 P 13
RADIOLYTIC GAS
028723 P 14 077129 P 28
RADIONUCLIDE TRANSFER
069312 P 25 075312 P 28 077945 P 30
RADIONUCLIDE UPTAKE
064768 P 24 066272 P 24 069312 P 25 075312 P 28
077945 P 30

RADIUM
007852 P 2
RADON
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 036537 P 16
RAINOUT
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7 030129 P 14 070249 P 26
REACTOR COOLANT
092878 P 32 093596 P 33
REACTOR POWER
021668 P 10
REACTOR, HWR
011130 P 4 013772 P 5 023868 P 11 027976 P 13
REACTOR, LMFBR
092878 P 32
REACTOR, MARITIME
014861 P 9
REACTOR, POWER
030129 P 14 077191 P 29
REACTOR, PRESSURE TUBE
023868 P 11
REACTOR, PWR
014861 P 9 023868 P 11
REACTOR, TEST
025984 P 12
REGULATION
007577 P 2 077129 P 28
REPORT, OPERATIONS
023868 P 11
RESOURCE, NATURAL
030136 P 14
RESPIRATION
042769 P 19
RESPONSE SPECTRUM
077172 P 29
RESPONSE TIME
068112 P 25
REVIEW
042769 P 19 068112 P 25 077198 P 30
RHODIUM
025597 P 12
RISO
063405 P 23
RUTHENIUM
089573 P 32
SAFETY EVALUATION
014861 P 9
SAMPLING
007416 P 2 007577 P 2 007680 P 2 007852 P 2
008709 P 4 009238 P 4 013775 P 5 013776 P 5
013777 P 6 013778 P 6 013779 P 6 013780 P 6
013781 P 6 013782 P 7 013783 P 7 013784 P 7
025597 P 12 026278 P 13 028723 P 14 030136 P 14
030464 P 15 037365 P 17 043804 P 20 057549 P 22
061201 P 22 061410 P 22 061931 P 22 070255 P 26
073286 P 27 075312 P 28 079785 P 30 082302 P 31
082850 P 31
SAVANNAH RIVER PLANT
023269 P 11 027976 P 13 043089 P 19 064768 P 24
065252 P 24
SCINTILLATION
077198 P 30 094649 P 33 096158 P 34
SEDIMENT
077945 P 30
SENSITIVITY ANALYSIS
068112 P 25 077165 P 29
SKIN
075281 P 28
SOCIO/PHILOSOPHICAL CONSIDERATION
077191 P 29
SODIUM
025597 P 12 092878 P 32
SOIL, NUCLIDE OCCURRENCE
077945 P 30 081594 P 31
SOLID
005383 P 1 005771 P 1
SOLID STATE DEVICE
036537 P 16 056070 P 21 070249 P 26
SORPTION
027976 P 13 031431 P 15
SOURCE, ELEVATED
061201 P 22
SOUTH AFRICA
013806 P 8
SPECTROMETRY
077129 P 28 081436 P 30 082850 P 31
SPECTROMETRY, ALPHA
007416 P 2 070252 P 26
SPECTROMETRY, BETA
040792 P 18 041955 P 19 070252 P 26 077172 P 29
SPECTROMETRY, GAMMA
030394 P 15 070249 P 26 070255 P 26 081594 P 31
STACK
033384 P 16 061410 P 22 066861 P 25
STATISTICAL ANALYSIS
021668 P 10
STIMULATION
082302 P 31
STRATOSPHERE
025597 P 12 028116 P 13 030129 P 14
STRONTIUM
004811 P 1 005771 P 1 007852 P 2 013775 P 5
013776 P 5 013777 P 6 013778 P 6 013779 P 6
013780 P 6 013781 P 6 013782 P 7 013783 P 7
013784 P 7 025597 P 12 066272 P 24 070063 P 26
077945 P 30
SULFUR
007852 P 2 040774 P 18
SURFACE CONTAMINATION
009238 P 4 021195 P 10 026278 P 13 030129 P 14
030464 P 15 044996 P 20
SURFACE FILM DEPOSIT
061489 P 22
SURFACE WATER, DISPOSAL MEDIA
081594 P 31
SURFACE WATER, NUCLIDE OCCURRENCE
004811 P 1 013347 P 5 013795 P 8 013925 P 8
069312 P 25 070063 P 26 075312 P 28 077945 P 30
081594 P 31
SURFACE WATER, SUSPENDED MATERIAL
004811 P 1
SURFACE WATER, TRACER
006958 P 1
SURVEY, EMERGENCY
007577 P 2
SURVEY, ENVIRONMENT
004811 P 1 013775 P 5 013776 P 5 013777 P 6
013778 P 6 013779 P 6 013780 P 6 013781 P 6
013782 P 7 013783 P 7 013784 P 7 069312 P 25
081594 P 31
SURVEY, RADIATION
075312 P 28 077172 P 29
SYSTEM ANALYSIS
068112 P 25
SYSTEM CAPABILITY
068112 P 25
SYSTEM DESCRIPTION
063489 P 23 066861 P 25 071338 P 27
TANTALUM
070249 P 26
TECHNICAL SPECIFICATIONS
014861 P 9
TEST, BENCH
024286 P 11
TEST, DOP FILTER
014861 P 9
TEST, INSTRUMENT RESPONSE
008680 P 4 024591 P 12 037755 P 17 037759 P 17
TEST, WEAPONS
077191 P 29
TESTING
030136 P 14 043804 P 20 061931 P 22 096879 P 34
THEORETICAL INVESTIGATION
030689 P 15
THERMAL CONSIDERATION
030129 P 14
THORIUM
007852 P 2 070063 P 26
TRACE ELEMENT
066272 P 24
TRACER
006958 P 1 093596 P 33
TRACER, GAS
017268 P 9 093596 P 33
TRACER, RADIOACTIVE
006958 P 1 013796 P 8 016938 P 9 017268 P 9
033384 P 16 061201 P 22 077945 P 30
TRANSPORT
042769 P 19
TRANSPORTATION AND HANDLING
061931 P 22 075963 P 28
TROPOSPHERE
025597 P 12 030129 P 14 038591 P 17
TUNGSTEN
025597 P 12
UNITED KINGDOM
007852 P 2 025984 P 12 036925 P 16 070249 P 26
UNITED STATES
093596 P 33

URANIUM
007852 P 2 013775 P 5 013776 P 5 013777 P 6
013778 P 6 013779 P 6 013780 P 6 013781 P 6
013782 P 7 013783 P 7 013784 P 7 070063 P 26
USSR
061936 P 23
VAPOR PRESSURE
027976 P 13
VEGETATION
042769 P 19 069312 P 25
WASTE DISPOSAL
014861 P 9 040479 P 18 061931 P 22
WASTE DISPOSAL, GAS
036925 P 16 094798 P 34
WASTE HANDLING
094798 P 34 096158 P 34
WASTE STORAGE
061931 P 22 094798 P 34
WASTE TREATMENT
066272 P 24 077191 P 29
WATER
011470 P 4 026278 P 13 028116 P 13 031431 P 15
041955 P 19 042769 P 19 044996 P 20 051100 P 21
061936 P 23 064768 P 24 066056 P 24 079785 P 30
082302 P 31 082850 P 31
WATER POLLUTION
077945 P 30
WATER VAPOR
030689 P 15 033384 P 16 082070 P 31
XENON
023868 P 11 057549 P 22 063405 P 23 066272 P 24
077129 P 28
YTTRIUM
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7
ZIRCALOY
061489 P 22
ZIRCONIUM
013775 P 5 013776 P 5 013777 P 6 013778 P 6
013779 P 6 013780 P 6 013781 P 6 013782 P 7
013783 P 7 013784 P 7

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

AKHTAR S
013796 P 8
ALBENESIUS FL
043089 P 19 064768 P 24
ANDREWS VE
037365 P 17
ANSPAUGH LR
070255 P 26
ARDELLIER A
030689 P 15
ASSCHE J
042769 P 19
BAKER RP
023245 P 11
BALKWELL WR
008150 P 3 009238 P 4
BALLARD LF
051956 P 21
BANVILLE B
008679 P 3 008680 P 4
BARATTA EJ
066056 P 24
BARLOW O
044996 P 20
BARLOW OM
037755 P 17
BARRY PE
090669 P 32
BARTON CJ
055111 P 21
BEK-UZAROV DJ
094457 P 33
BERSAQUES DE
041898 P 19
BLOCK S
037755 P 17 044996 P 20
BOGEN DC
070252 P 26
BOUTOT P
024286 P 11
BRADLEY AE
069312 P 25 081629 P 31
BREWER PG
070063 P 26
BROWN R
077165 P 29
BROWN R, ET AL.
081436 P 30
BRUNDAGE RS
064263 P 23
BURT AK
011130 P 4 011470 P 4
BUTLER HW
055111 P 21 061931 P 22
BUTTLAR HV
013347 P 5 013795 P 8
CAMERON JF
013794 P 7 028116 P 13
CAMPBELL DA
093596 P 33
CARTER MW
077191 P 29
COCHRAN JA
061410 P 22 073286 P 27
COLMENARES C
090669 P 32
CORTI F
008709 P 4
COSTES C
042769 P 19
COWPER G
006997 P 2 013772 P 5 015267 P 9 077945 P
CUMMING RB
055111 P 21
CURTIS ML
094614 P 33 096158 P 34
DALY JC
061201 P 22
DEROCHE M
042769 P 19
DEVIRTS AL
061936 P 23
DIXON JE
037755 P 17
DOBKINA EI
061936 P 23
DULCINO J
052185 P 21
DUMMER JE
007577 P 2
DUNN LM
037365 P 17
ENGELKE MJ
008455 P 3
FARZINE K
013795 P 8
FERRON F
042769 P 19
FLORKOWSKI T
028116 P 13
FREJAVILLE G
016975 P 9
FUKUDA S
056432 P 21
GABAY JJ
033384 P 16 061201 P 22
GANT P
064263 P 23
GELEZUNAS, VL
056070 P 21
GIBSON JA
011130 P 4 011470 P 4
GIRTON RC
089573 P 32
GREENHOUSE NA
066861 P 25
GRIFFIN WR
073286 P 27
HADZISEHOVIC M
094457 P 33
HANNAHS BJ
075963 P 28
HAYWOOD FF
061931 P 22
HEWKA, PV
056070 P 21
HODGEKINS D
044996 P 20
HODGKINS DJ
037755 P 17
HOLLADAY G
070255 P 26
HOLLAND JZ
025597 P 12
HOY JE
023769 P 11
HUTCHIN WH
069312 P 25
HUTH, GC
056070 P 21
ISTOMINA AG
024192 P 11
IYENGAR TS
007680 P 2
JACHYMEK A
047841 P 20
JACKSON S
007852 P 2
JACOBS DG
030129 P 14
JAMES, RT
025984 P 12
JAQUISH RE
057549 P 22
JOHNS FB
057549 P 22
JOHNS TF
036925 P 16
KADWANI MG
094649 P 33
KAKEY LT
089573 P 32
KANG Y
038591 P 17
KANTER M
063489 P 23
KATKIEWICZ W
047841 P 20
KAWASAKI H
079785 P 30

KERSHNER CJ
075963 P 28
KNOWLES FE
066056 P 24
KOENIG LA
075312 P 28
KONIG LA
074336 P 27
KORANDA JJ
070255 P 26
KOSKI WS
036224 P 16
KROH J
041955 P 19
KUBOSE DA
008150 P 3 009238 P 4
KUMAR R
092878 P 32
KUNZ CR
077129 P 28
KUNZE J
096879 P 34
LAMBERGER PH
094798 P 34
LARSEN OW
063405 P 23
LEBOULEUX P
030689 P 15
LEBOUTON AV
040792 P 18
LINDEKEN CL
024591 P 12
LOCANTE J
093596 P 33
MAEKAWA S
040773 P 18
MAGNO PJ
061410 P 22
MANN WB
051100 P 21 077198 P 30
MARTER WL
065252 P 24
MATUSZEK JM
077129 P 28
MAUSHART R
029220 P 14 031396 P 15
MAWSON CA
077945 P 30
MCCONNON D
026278 P 13
MEGERTH FH
061489 P 22
MERRILL RT
006680 P 1
MEYER HE
077165 P 29 081436 P 30
MEYER LH
043089 P 19
MOCILNIK I
094457 P 33
MOGHISSI AA
077191 P 29
MORIMOTO EM
069312 P 25
MORITA I
040773 P 18
MORRIS EC
027976 P 13
MOSKALEV YI
075281 P 28
MOTES BG
064263 P 23
MULLINS JW
037365 P 17
MURAKAMI K
040773 P 18
NEARY HP
085814 P 32
NOAKES JE
085814 P 32
OCHIAI T
079785 P 30
OLLER WL
077172 P 29
OSBORNE PV
013772 P 5 015267 P 9 021994 P 10 024740 P
068112 P 25 082302 P 31
OSTLUND HG
043804 P 20 051081 P 20 094616 P 33
OSTLUND JG
064018 P 23
OTLET RL
040000 P 17
PAIX D
030394 P 15
PANEK AF
092878 P 32
PAPERIELLO CJ
077129 P 28
PATTERSON CM
065252 P 24
PAVLICSEK I
082850 P 31
PAYNE BR
013794 P 7 028116 P 13
PENCE DT
089573 P 32
PERRY KE
007416 P 2
PETROFF C
036724 P 16
PHELPS PL
070255 P 26
PLATO PA
077172 P 29
PLONKA AM
041955 P 19
PORTER NS
036537 P 16
PORTER SW
021668 P 10
PREVO CT
037759 P 17
PRINCE JR
005383 P 1 021195 P 10 030464 P 15
RAGLAND JB
040774 P 18
RAKVACSNE SO
082850 P 31
RAUE DJ
092878 P 32
REINING WC
064768 P 24
RHINEHAMMER TB
094798 P 34
RICHARDS D
023245 P 11
ROBINSON B
074953 P 27 077165 P 29 081436 P 30
ROHWER PS
055111 P 21
SADARANGANI SH
007680 P 2
SALMON L
070249 P 26
SANNES F
008679 P 3
SANTOMASSINO VC
024591 P 12 037759 P 17
SAX NI
033384 P 16 061201 P 22
SCHIPFER P
024286 P 11
SCOWN KM
066861 P 25
SELLSCHOP JP
006958 P 1 013806 P 8
SHAPIRO EG
066861 P 25 090669 P 32
SHEEHAN WE
094614 P 33
SHEEHAS WE
096158 P 34
SHLEIEN B
061410 P 22
SHTUKKENBERG YM
024192 P 11
SILVER WJ
066861 P 25
SINGH AN
094649 P 33
SLABACK LA
021668 P 10
SMITH CF
030136 P 14
SMITH DG
061410 P 22
SMITH HA
013796 P 8
SOMASUNDARAM S

007680 P 2
SPAULDING JD
085814 P 32
SPEAR WG
036537 P 16
SPENCER DW
070063 P 26
STUSSI H
031431 P 15
SUTRA-FOURCADE Y
042995 P 19
TAKAHASHI T
013925 P 8
TAYLOR NA
007852 P 2
THATCHER LL
028116 P 13
TICE G
077164 P 29
TOURFAU AEP
070249 P 26
TROIANELLO FJ
073286 P 27
VALENTINE AM
028723 P 14
VALERO S
030689 P 15
VAZE PK
007680 P 2
VERES A
082850 P 31
VERHAGEN BT
006958 P 1 013806 P 8
VINOGRADOV AP
061936 P 23
VOGT KJ
008568 P 3
WADLEIGH W
069312 P 25
WANG CH
005383 P 1 021195 P 10 030464 P 15
WATERS JR
036224 P 16
WEBER KH
096879 P 34
WELFORD GA
070252 P 26
WILLES E
069312 P 25
WILLES EH
081629 P 31
WINTER M
074336 P 27 075312 P 28
WOHLFAHRT D
013795 P 8
YOSHIDA Y
056432 P 21
ZAK WM
063405 P 23

PERMUTED TITLE INDEX

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN THE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE. * INDICATES END OF TITLE.)

FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN	ABMIENT AIR ATMOSPHERE* ULTRASENSITIVE FIELD AIR SAMPLER	081436 P 30
TRITIATED WATER* #INTERNAL GAS CCUNTING METHOD FOF	ABSOLUTE MEASUREMENTS CF THE SPECIFIC RADIOACTIVITY OF	094457 P 33
AND ANALYTICAL CHEMISTRY, OCT. 10-11, 1972, PROGRAM AND	ABSTRACTS* ANNUAL CONFERENCE ON BIOASSAY, ENVIRONMENTAL	081594 P 31
#MODEL 200	AC/DC AIR SAMPLER*	008455 P 3
#THE DETERMINATION OF	ACCURACY AND PRECISION LIMITS FOR TRITIUM IN WATER*	066056 P 24
MONITORING* #	ACCURACY OF METHODS ANC INTERPRETATION OF RESULTS OF H-3	029220 P 14
#APPARATUS FOR CONCENTRATION AND MEASUREMENT OF LOW TRITIUM	ACTIVITIES*	013794 P 7
#DETERMINATION OF THE TGTAL TRITIUM	ACTIVITY ADSORBED CN THE SURFACE OF VARIOUS METALS*	008150 P 3
#CONCENTRATION, STORAGE, AND DETERMINATION OF TRITIUM AT	ACTIVITY LEVELS OF 10(MINUS 8TH) TO 10(MINUS 10TH) MOLE	013796 P 8
133* #CALIBRATION OF AIRBORNE AND GASEOUS	ACTIVITY MONITORS USED IN THE DR3 REACTOR BY AR-41 AND XE-	063405 P 23
#MINIMUM DETECTABLE	ACTIVITY OF BETA EMITTERS BY BETA SPECTRUM ANALYSIS*	077172 P 29
#A LABORATORY APPARATUS FOR MEASURING THE AMOUNT OF TRITIUM	ACTIVITY REMOVED FROM A CONTAMINATED SURFACE, BY DIRECT	009238 P 4
#CONTINUOUS SAMPLING AND MEASUREMENT OF AIRBORNE	ACTIVITY, SESSION III*	007416 P 2
#N S SAVANNAH CHANGE 5 - MISC.	ADMINISTRATION AND TESTING*	014861 P 9
#DETERMINATION OF THE TOTAL TRITIUM ACTIVITY	ADSORBED ON THE SURFACE OF VARIOUS METALS*	008150 P 3
#TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH	AFRICAN SITES*	013806 P 8
#MEANS OF DETECTING AND PROTECTING	AGAINST TRITIUM*	042995 P 19
DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN ABMIENT	AIR ATMOSPHERE* ULTRASENSITIVE FIELD AIR SAMPLER FOR	081436 P 30
DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT	AIR ATMOSPHERE*ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR	077165 P 29
DIFFERENTIALLY DETERMINING TRITIUM OXICE AND GAS IN AMBIENT	AIR ATMOSPHERE*ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR	074953 P 27
#DETECTION OF THE CONTAMINATION OF	AIR BY TRITIATED WATER VAPOUR AROUND THE REACTOR EL 3*	030689 P 15
FACILITY IN GERMANY* #RADIOACTIVE	AIR CONTAMINATION MEASUREMENT METHODS FOR NUCLEAR REACTOR	008568 P 3
#TRITIUM-IN-	AIR GENERATOR FOR DYNAMIC CALIBRATION OF TRITIUM MONITORS*	024591 P 12
#MEASUREMENT CF TRITIUM IN	AIR IN THE PRESENCE OF GAMMA RADIATION*	013772 P 5
#A PCRTABLE TRITIUM-IN-	AIR MONITOR*	008679 P 3
#REMOTE TRITIUM	AIR MONITORING SYSTEM*	027976 P 13
#CALIBRATION CF TRITIUM-IN-	AIR MONITORS*	008680 P 4
AND GAS IN ABMIENT AIR #A RUGGEDIZED ULTRASENSITIVE FIELD	AIR SAMPLER FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE	081436 P 30
OXIDE AND GAS IN AMBIENT #A RUGGEDIZED ULTRASENSITIVE FIELD	AIR SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM	077165 P 29
OXIDE AND GAS IN AMBIENT #A RUGGEDIZED ULTRASENSITIVE FIELD	AIR SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM	074953 P 27
#MODEL 200 AC/DC	AIR SAMPLER*	008455 P 3
#CONTINUOUS MONITCR FCR TRITIUM IN	AIR WITH HIGH SENSITIVITY AND WIDE RANGE*	077164 P 29
#THE DETECTION CF TRITIUM IN	AIR WITH IONIZATION CHAMBERS*	015267 P 9
#A CCLC STRIP APPARATUS FOR SAMPLING TRITIUM IN	AIR*	007680 P 2
#A METHOD FOR CONTINUOUS MEASUREMENT CF TRITIATED WATER IN	AIR*	011470 P 4
#A METHOD FOR CONTINUOUS MEASUREMENT CF TRITIATED WATER IN	AIR*	011130 P 4
SYSTEM FOR THE CONTINUOUS MONITORING OF TRITIUM IN THE	AIR.* #A SENSITIVE DETECTOR	094649 P 33
#CONTINUOUS SAMPLING AND MEASUREMENT OF	AIRBORNE ACTIVITY, SESSION III*	007416 P 2
REACTOR BY AR-41 AND XE-133* #CALIBRATION OF	AIRBORNE AND GASEOUS ACTIVITY MONITORS USED IN THE DR3	063405 P 23
FUEL REPROCESSING PLANT* #AN INVESTIGATION OF	AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR	061410 P 22
OF LIQUID SCINTILLATICN SPECTRCMETRY FOR TCTAL BETA AND	ALPHA ASSAY* #APPLICATION	070252 P 26
FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN	AMBIENT AIR ATMOSPHERE* FIELD AIR SAMPLER SYSTEM	074953 P 27
FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN	AMBIENT AIR ATMOSPHERE* FIELD AIR SAMPLER SYSTEM	077165 P 29
SURFACE, BY #A LABORATORY APPARATUS FOR MEASURING THE	AMOUNT CF TRITIUM ACTIVITY REMOVED FROM A CONTAMINATED	009238 P 4
#CONSTRUCTION OF A SIMPLE TRITIUM MONITOR AND A TRITIUM	AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-RAY	096879 P 34
#	ANALYSIS OF ATMOSPHERIC GASES*	057549 P 22
#TECHNIQUES FOR MCNITCRING AND	ANALYSIS OF ENVIRONMENTAL TRITIUM*	037365 P 17
SAMPLES* #GAS	ANALYSIS RESULTS FCR PROJECT RULISCN PRODUCTION TESTING	030136 P 14
DETECTABLE ACTIVITY OF BETA EMITTERS BY BETA SPECTRUM	ANALYSIS* #MINIMUM	077172 P 29
EIGHTEENTH ANNUAL CONFERENCE ON BIOASSAY, ENVIRCNMENTAL AND	ANALYTICAL CHEMISTRY, CCT. 10-11, 1972, PROGRAM ANC	081594 P 31
#	ANALYTICAL METHODS IN OCEANOGRAPHY - I. INORGANIC METHODS*	070063 P 26
RADIOACTIVITY* #SAMPLING AND	ANALYTICAL SYSTEMS FOR MEASURING ENVIRONMENTAL	070255 P 26
AT SAVANNAH RIVER* #	ANALYTICAL TECHNIQUES FOR THE USE AND CONTROL CF TRITIUM	043089 P 19
#AN	ANALYZER FOR RADIOACTIVE GAS*	006680 P 1
TRAINING MANUAL CN THE USE OF ISOTOPES AND RADIATION IN	ANIMAL RESEARCH* #LABORATORY	016938 P 9
#ASSAY OF TRITIUM AND CARBON-14 IN	ANIMAL TISSUES BY LIQUID SCINTILLATION.*	052185 P 21
ACTIVITIES* #	APPARATUS FOR CONCENTRATION AND MEASUREMENT OF LOW TRITIUM	013794 P 7
#SAMPLE CCMBUSTION	APPARATUS FOR LIQUID SCINTILLATION COUNTING*	040773 P 18
REMOVED FROM A CCNTAMINATED SURFACE, BY #A LABORATORY	APPARATUS FOR MEASURING THE AMOUNT OF TRITIUM ACTIVITY	009238 P 4
#A COLD STRIP	APPARATUS FOR SAMPLING TRITIUM IN AIR*	007680 P 2
BETA AND ALPHA ASSAY* #	APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL	070252 P 26
OF HYDROGEN ANC CXYGEN ISOTOPES IN NATURAL WATERS AND ITS	APPLICATION TO METEOROLOGY AND HYDROLOGY, FINAL REPORT*	028116 P 13
#ATMOSPHERIC TRITIUM, MEASUREMENT AND	APPLICATION*	016975 P 9
FCR DETECTION OF TRITIUM HAZARD DESIGNED FOR MILITARY	APPLICATION* #RELIABLE AND VERSATILE INSTRUMENTATION	023245 P 11
#LOW-LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL	APPLICATIONS*	040000 P 17
#NEW	APPROACH TO TRITIUM LEAK RATE DETERMINATION*	096158 P 34
#NEW	APPROACH TO TRITIUM LEAK RATE DETERMINATION*	094614 P 33
AND GASEOUS ACTIVITY MONITORS USED IN THE DR3 REACTOR BY	AR-41 AND XE-133* #CALIBRATION OF AIRBORNE	063405 P 23
UPPER ATMOSPHERE* #PROBLEMS	ARISING IN THE STUCY OF RADIOACTIVE CONTAMINATION OF THE	025597 P 12
#RADIATICN-INDUCED H-T EXCHANGE IN	AROMATIC HYDROCARBONS SATURATED WITH TRITIATED WATER*	041955 P 19
OF THE CONTAMINATICN OF AIR BY TRITIATED WATER VAPOUR	AROUND THE REACTOR EL 3* #DETECTION	030689 P 15
#A PROPANE BUBBLE CHAMBER	AS A LCW LEVEL COUNTER FCR TRITIUM AND CARBON-14*	036224 P 16
#THE USE OF WATER	AS A SAMPLING MEDIUM FCR TRITIUM OXIDE*	026278 P 13
DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR	AS THE TRACER* #GRAPHICAL EVALUATION OF EXPERIMENTS TO	074336 P 27
#ENRICHMENT AND	ASSAY OF NATURALLY OCCURRING TRITIUM*	006958 P 1
SCINTILLATION.* #	ASSAY CF TRITIUM AND CARBON-14 IN ANIMAL TISSUES BY LIQUID	052185 P 21
LIQUID SCINTILLATICN SPECTRCMETRY FOR TOTAL BETA AND ALPHA	ASSAY* #APPLICATICN OF	070252 P 26
IN THE STUDY OF RADIOACTIVE CONTAMINATION CF THE UPPER	ATMOSPHERE* #PRCBLEMS ARISING	025597 P 12

DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR	ATMOSPHERE* FIELD AIR SAMPLER FOR DIFFERENTIALLY	081436 P 30
DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR	ATMOSPHERE* FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY	077165 P 29
DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR	ATMOSPHERE* FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY	074953 P 27
TRACER* #GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE	ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE	074336 P 27
#ANALYSIS OF	ATMOSPHERIC GASES*	057549 P 22
#A SAMPLING SYSTEM FOR	ATMOSPHERIC HT AND HTO*	094616 P 33
#A RAPID FIELD SAMPLING SYSTEM FOR TRITIUM IN	ATMOSPHERIC HYDROGEN*	064018 P 23
#A RAPID-FIELD SAMPLING SYSTEM FOR TRITIUM IN	ATMOSPHERIC HYDROGEN*	043804 P 20
#	ATMOSPHERIC TRITIUM. MEASUREMENT AND APPLICATION*	016975 P 9
#A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM	ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF	007852 P 2
PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972*#	ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH	077945 P 30
LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, #	ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR	066272 P 24
OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY	AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES IN URINE*	007852 P 2
#RESEARCH ON	AVALANCHE TYPE SEMICONDUCTOR RADIATION DETECTORS*	056070 P 21
VIAL* #	BACKGROUND RATES IN TRITIUM COUNTING - THE EFFECT OF THE	030394 P 15
#SOURCES OF TRITIUM AND ITS	BEHAVIOR UPON RELEASE TO THE ENVIRONMENT*	030129 P 14
#APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL	BETA AND ALPHA ASSAY*	070252 P 26
#MINIMUM DETECTABLE ACTIVITY OF	BETA EMITTERS BY BETA SPECTRUM ANALYSIS*	077172 P 29
#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT	BETA EMITTERS*	021195 P 10
#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT	BETA EMITTERS*	030464 P 15
#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT	BETA EMITTERS*	005383 P 1
#MINIMUM DETECTABLE ACTIVITY OF BETA EMITTERS BY	BETA SPECTRUM ANALYSIS*	077172 P 29
OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION -	BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF	042769 P 19
(DEC. 1968-JAN. 1972)* #	BIBLIOGRAPHY ON HANDLING CONTROL AND MONITORING OF TRITIUM	075963 P 28
11, 1972, PROGRAM AND #EIGHTEENTH ANNUAL CONFERENCE ON	BIOASSAY, ENVIRONMENTAL AND ANALYTICAL CHEMISTRY, OCT. 10-	081594 P 31
#FACILITY FOR THE DETERMINATION OF LOW-LEVEL TRITIUM IN	BIOLOGICAL AND ENVIRONMENTAL SAMPLES*	069312 P 25
1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA LIMITED,	BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL	077945 P 30
ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES,	BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN.	066272 P 24
LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC DIVISION OF	BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART.	036537 P 16
CARBON-14* #A PROPANE	BUBBLE CHAMBER AS A LOW LEVEL COUNTER FOR TRITIUM AND	036224 P 16
#AN INVESTIGATION OF A	BUBBLER TRITIUM SAMPLER*	028723 P 14
#THE NATIONAL	BUREAU OF STANDARDS TRITIATED WATER STANDARDS.*	051100 P 21
#A TECHNIQUE FOR DEMONSTRATING	C-MAX OF A PLUME USING TRITIATED MOISTURE*	061201 P 22
#STUDY ON THE VARIATION OF TRITIUM AND	C-14 CONCENTRATIONS IN THE ENVIRONMENT*	038591 P 17
DETECTION* #A EUROPIUM-DOPED,	CALCIUM-FLUORIDE SCINTILLATOR SYSTEM FOR LOW-LEVEL TRITIUM	090669 P 32
IN THE DP3 REACTOR BY AR-41 AND XE-133* #	CALIBRATION OF AIRBORNE AND GASEOUS ACTIVITY MONITORS USED	063405 P 23
#TRITIUM-IN-AIR GENERATOR FOR DYNAMIC	CALIBRATION OF TRITIUM MONITORS*	024591 P 12
#	CALIBRATION OF TRITIUM-IN-AIR MONITORS*	008680 P 4
PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972*#ATOMIC ENERGY OF	CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION	077945 P 30
AND HEALTH PHYSICS DIVISION, PROGRESS #ATOMIC ENERGY OF	CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY	066272 P 24
#ASSAY OF TRITIUM AND	CARBON-14 IN ANIMAL TISSUES BY LIQUID SCINTILLATION.*	052185 P 21
BUBBLE CHAMBER AS A LOW LEVEL COUNTER FOR TRITIUM AND	CARBON-14* #A PROPANE	036224 P 16
OF TRITIATED WATER USING A PLASTIC-SCINTILLATOR FLOW	CELL* #THE DETECTION	037759 P 17
LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE	CHALK RIVER NUCLEAR LABORATORIES* #THE MEASUREMENT OF HIGH	006997 P 2
PHYSICS DIVISION, #ATOMIC ENERGY OF CANADA LIMITED,	CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH	066272 P 24
#A PROPANE BUBBLE	CHAMBER AS A LOW LEVEL COUNTER FOR TRITIUM AND CARBON-14*	036224 P 16
#THE DETECTION OF TRITIUM IN AIR WITH IONIZATION	CHAMBERS*	015267 P 9
#A S SAVANNAH	CHANGE 5 - MISC. ADMINISTRATION AND TESTING*	014861 P 9
#	CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES*	077129 P 28
REPROCESSING PLANT* #	CHARACTERIZATION OF TRITIUM STACK EFFLUENT FROM A FUEL	073286 P 27
#THE STACK MONITOR SYSTEM AT THE IDAHO	CHEMICAL PROCESSING PLANT*	089573 P 32
ANNUAL CONFERENCE ON BIOASSAY, ENVIRONMENTAL AND ANALYTICAL	CHEMISTRY, OCT. 10-11, 1972, PROGRAM AND ABSTRACTS*	081594 P 31
#COUNTING OF TRITIATED COMPOUNDS ON PAPER	CHROMATOGRAMS*	041898 P 19
#TRITIUM MEASUREMENT BY GAS-SOLID	CHROMATOGRAPHY*	023269 P 11
REPORT II, MAY - JULY 1970* #ZIRCALOY -	CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS	061489 P 22
#A	COLD STRIP APPARATUS FOR SAMPLING TRITIUM IN AIR*	007680 P 2
#SAMPLE	COMBUSTION APPARATUS FOR LIQUID SCINTILLATION COUNTING*	040773 P 18
#	COMBUSTION SAMPLES FOR LIQUID SCINTILLATION COUNTING*	040774 P 18
#A TRITIUM PROPORTIONAL COUNTER WITH GAMMA	COMPENSATION*	037755 P 17
#A NEW FAMILY OF TRITIUM MONITORING EQUIPMENT OFFERING	COMPLETE PERSONNEL PROTECTION*	027925 P 13
#COUNTING OF TRITIATED	COMPOUNDS ON PAPER CHROMATOGRAMS*	041898 P 19
#APPARATUS FOR	CONCENTRATION AND MEASUREMENT OF LOW TRITIUM ACTIVITIES*	013794 P 7
PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM	CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE	013795 P 8
PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM	CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE	013347 P 5
#MEASUREMENT OF TRITIUM	CONCENTRATION OF NATURAL WATERS*	082850 P 31
ACTIVITY LEVELS OF 10(MINUS 8TH) TO 10(MINUS 10TH) MOLE #	CONCENTRATION, STORAGE, AND DETERMINATION OF TRITIUM AT	013796 P 8
#STUDY ON THE VARIATION OF TRITIUM AND C-14	CONCENTRATIONS IN THE ENVIRONMENT*	038591 P 17
CHEMISTRY, OCT. 10-11, 1972, PROGRAM AND #EIGHTEENTH ANNUAL	CONFERENCE ON BIOASSAY, ENVIRONMENTAL AND ANALYTICAL	081594 P 31
AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-RAY #	CONSTRUCTION OF A SIMPLE TRITIUM MONITOR AND A TRITIUM	096879 P 34
ACTIVITY REMOVED FROM A CONTAMINATED SURFACE, BY DIRECT	CONTACT WITH THE SURFACE* MEASURING THE AMOUNT OF TRITIUM	009238 P 4
#FATE OF RADIOACTIVE	CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2*	004811 P 1
#DECONTAMINATION TESTS ON TRITIUM-	CONTAMINATED MATERIALS*	024286 P 11
FOR MEASURING THE AMOUNT OF TRITIUM ACTIVITY REMOVED FROM A	CONTAMINATED SURFACE, BY DIRECT CONTACT WITH THE SURFACE*	009238 P 4
FACILITY IN GERMANY* #RADIOACTIVE AIR	CONTAMINATION MEASUREMENT METHODS FOR NUCLEAR REACTOR	008568 P 3
#TRANSISTORISED PORTABLE TRITIUM	CONTAMINATION MONITOR*	047841 P 20
REACTOR EL 3* #DETECTION OF THE	CONTAMINATION OF AIR BY TRITIATED WATER VAPOUR AROUND THE	030689 P 15
#A METHOD FOR EVALUATING SURFACE	CONTAMINATION OF SOFT BETA EMITTERS*	021195 P 10
#A METHOD FOR EVALUATING SURFACE	CONTAMINATION OF SOFT BETA EMITTERS*	030464 P 15
#A METHOD FOR EVALUATING SURFACE	CONTAMINATION OF SOFT BETA EMITTERS*	005383 P 1
DEACTIVATION MEASURES* #THE CONTROL OF THE	CONTAMINATION OF SURFACES WITH TRITIUM OXIDES AND	024192 P 11

#TRITIUM
#PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE
#MEASUREMENT OF TRITIUM SURFACE
#DETERMINATION OF TRITIUM
#THE CURRENT TRITIUM
#A METHOD FOR
#A METHOD FOR
SENSITIVITY AND WIDE RANGE* #
#A SENSITIVE DETECTOR SYSTEM FOR THE
COVER GAS OF AN LMFBR* #
SESSION III* #
#BIBLIOGRAPHY ON HANDLING
OXIDES AND DEACTIVATION MEASURES* #THE
#ANALYTICAL TECHNIQUES FOR THE USE AND
PLANT* #
#HAZARDS
#TRITIUM
#CONTINUOUS MONITORS FOR TRITIUM IN SODIUM
#METHOD FOR DETERMINING REACTOR
#A PROPANE BUBBLE CHAMBER AS A LOW LEVEL
#A TRITIUM PROPORTIONAL
#TRITIUM MEASUREMENTS WITH A NEW LIQUID SCINTILLATION
#RECENT TECHNIQUES IN TRITIUM MONITORING BY PROPORTIONAL
#BACKGROUND RATES IN TRITIUM
RADIOACTIVITY OF TRITIATED WATER* #INTERNAL GAS
OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-
OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-
#COMBUSTION SAMPLES FOR LIQUID SCINTILLATION
#SAMPLE COMBUSTION APPARATUS FOR LIQUID SCINTILLATION
#A RISETIME DISCRIMINATOR FOR LOW LEVEL TRITIUM
#CONTINUOUS MONITORS FOR TRITIUM IN SODIUM COOLANT AND
#STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT
#THE
#SELECTED

CONTAMINATION OF THE ENVIRONMENT* 075312 P 28
CONTAMINATION OF THE UPPER ATMOSPHERE* 025597 P 12
CONTAMINATION* 021668 P 10
CONTENT IN SAMPLES (A REVIEW) PART, I.* 008709 P 4
CONTENTS OF NATURAL WATERS* 061936 P 23
CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR* 011130 P 4
CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR* 011470 P 4
CONTINUOUS MONITOR FOR TRITIUM IN AIR WITH HIGH 077164 P 29
CONTINUOUS MONITORING OF TRITIUM IN THE AIR.* 094649 P 33
CONTINUOUS MONITORS FOR TRITIUM IN SODIUM COOLANT AND 092878 P 32
CONTINUOUS SAMPLING AND MEASUREMENT OF AIRBORNE ACTIVITY. 007416 P 2
CONTROL AND MONITORING OF TRITIUM (DEC. 1968-JAN. 1972)* 075963 P 28
CONTROL OF THE CONTAMINATION OF SURFACES WITH TRITIUM 024192 P 11
CONTROL OF TRITIUM AT SAVANNAH RIVER* 043089 P 19
CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER 064768 P 24
CONTROL PROGRESS REPORT NO. 34, MAY-AUGUST 1969* 040479 P 18
CONTROL TECHNOLOGY* 094798 P 34
COOLANT AND COVER GAS OF AN LMFBR* 092878 P 32
COOLANT SYSTEM LEAKAGE* 093596 P 33
COUNTER FOR TRITIUM AND CARBON-14* 036224 P 16
COUNTER WITH GAMMA COMPENSATION* 037755 P 17
COUNTER* 085814 P 32
COUNTERS* 044996 P 20
COUNTING - THE EFFECT OF THE VIAL* 030394 P 15
COUNTING METHOD FOR ABSOLUTE MEASUREMENTS OF THE SPECIFIC 094457 P 33
COUNTING OF TRITIATED COMPOUNDS ON PAPER CHROMATOGRAMS* 041898 P 19
COUNTING TECHNIQUE* #TRITIUM CONCENTRATION 013795 P 8
COUNTING TECHNIQUE* #TRITIUM CONCENTRATION 013347 P 5
COUNTING* 040774 P 18
COUNTING* 040773 P 18
COUNTING* 081629 P 31
COVER GAS OF AN LMFBR* 092878 P 32
CRNL* 024740 P 12
CURRENT TRITIUM CONTENTS OF NATURAL WATERS* 061936 P 23
CVTR OPERATING EXPERIENCE* 023868 P 11

OF THE CONTAMINATION OF SURFACES WITH TRITIUM OXIDES AND
BIBLIOGRAPHY ON HANDLING CONTROL AND MONITORING OF TRITIUM (
SAFETY DURING PRODUCTION TESTING, JAN. 1925, 1968- #
#A TECHNIQUE FOR
VERSATILE INSTRUMENTATION FOR DETECTION OF TRITIUM HAZARD
ANALYSIS* #MINIMUM
#MEANS OF
#
VAPOUR AROUND THE REACTOR EL 3* #
FLOW CELL* #THE
APPLICATION* #RELIABLE AND VERSATILE INSTRUMENTATION FOR
#THE
CALCIUM-FLUORIDE SCINTILLATOR SYSTEM FOR LOW-LEVEL TRITIUM
IN THE AIR.* #A SENSITIVE
#RESEARCH ON AVALANCHE TYPE SEMICONDUCTOR RADIATION
IN WATER* #THE
ENVIRONMENTAL SAMPLES* #FACILITY FOR THE
USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE
ENVIRONMENTAL SAMPLES* #PROCEDURES FOR
THE SURFACE OF VARIOUS METALS* #
8TH) TO 10(MINUS 10TH) MOLE #CONCENTRATION, STORAGE, AND
PART, I.* #
#NEW APPROACH TO TRITIUM LEAK RATE
#NEW APPROACH TO TRITIUM LEAK RATE
VAPOR AS THE TRACER*#GRAPHICAL EVALUATION OF EXPERIMENTS TO
#METHOD FOR
ULTRASENSITIVE FIELD AIR SAMPLER FOR DIFFERENTIALLY
ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY
ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY
#THE INSTALLED TRITIUM MONITORING SYSTEM IN THE
#A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR
#A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR
ABMIENT #A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER FOR
#A TRITIUM STACK MONITOR WITH A WIDE
OF TRITIUM ACTIVITY REMOVED FROM A CONTAMINATED SURFACE, BY
SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY
#A RISETIME
#SIMPLIFIED TECHNIQUE FOR STACK
EVALUATION OF EXPERIMENTS TO DETERMINE ATMOSPHERIC
NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC
ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS
RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS
TRITIUM DETECTION* #A EUROPIUM-
AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-RAY
OF AIRBORNE AND GASEOUS ACTIVITY MONITORS USED IN THE
#PROJECT GASBUGGY - ON-SITE RADIOLOGICAL SAFETY
#TRITIUM-IN-AIR GENERATOR FOR

DEACTIVATION MEASURES* #THE CONTROL 024192 P 11
DEC. 1968-JAN. 1972)* # 075963 P 28
DEC. 31, 1969* #PROJECT GASBUGGY - ON-SITE RADIOLOGICAL 068572 P 25
DECONTAMINATION TESTS ON TRITIUM-CONTAMINATED MATERIALS* 024286 P 11
DEMONSTRATING C-MAX OF A PLUME USING TRITIATED MOISTURE* 061201 P 22
DESIGNED FOR MILITARY APPLICATION* #RELIABLE AND 023245 P 11
DETECTABLE ACTIVITY OF BETA EMITTERS BY BETA SPECTRUM 077172 P 29
DETECTING AND PROTECTING AGAINST TRITIUM* 042995 P 19
DETECTION AND MEASUREMENT (TRITIUM)* 077198 P 30
DETECTION OF THE CONTAMINATION OF AIR BY TRITIATED WATER 030689 P 15
DETECTION OF TRITIATED WATER USING A PLASTIC-SCINTILLATOR 037759 P 17
DETECTION OF TRITIUM HAZARD DESIGNED FOR MILITARY 023245 P 11
DETECTION OF TRITIUM IN AIR WITH IONIZATION CHAMBERS* 015267 P 9
DETECTION* #A EUROPIUM-DOPED, 090669 P 32
DETECTOR SYSTEM FOR THE CONTINUOUS MONITORING OF TRITIUM 094649 P 33
DETECTORS* 056070 P 21
DETERMINATION OF ACCURACY AND PRECISION LIMITS FOR TRITIUM 066056 P 24
DETERMINATION OF LOW-LEVEL TRITIUM IN BIOLOGICAL AND 069312 P 25
DETERMINATION OF RADIONUCLIDES IN URINE* OF THE METHODS 007852 P 2
DETERMINATION OF STABLE ELEMENTS AND RADIONUCLIDES IN 005771 P 1
DETERMINATION OF THE TOTAL TRITIUM ACTIVITY ADSORBED ON 008150 P 3
DETERMINATION OF TRITIUM AT ACTIVITY LEVELS OF 10(MINUS 013796 P 8
DETERMINATION OF TRITIUM CONTENT IN SAMPLES (A REVIEW) 008709 P 4
DETERMINATION* 094614 P 33
DETERMINATION* 096158 P 34
DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER 074336 P 27
DETERMINING REACTOR COOLANT SYSTEM LEAKAGE* 093596 P 33
DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE 081436 P 30
DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE 074953 P 27
DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE 077165 P 29
DIDO AND PLUTO REACTOR HALLS* 025984 P 12
DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN 074953 P 27
DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN 077165 P 29
DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN 081436 P 30
DIGITAL RANGE* 066861 P 25
DIRECT CONTACT WITH THE SURFACE* FOR MEASURING THE AMOUNT 009238 P 4
DISC ELECTROPHORESIS* #LIQUID SCINTILLATION 040792 P 18
DISCRIMINATOR FOR LOW LEVEL TRITIUM COUNTING* 081629 P 31
DISPERSION MAPPING WITH TRITIUM* 033384 P 16
DISPERSION WITH TRITIATED WATER VAPOR AS THE TRACER* 074336 P 27
DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL 036537 P 16
DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972* # 077945 P 30
DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*LIMITED, CHALK 066272 P 24
DOPED, CALCIUM-FLUORIDE SCINTILLATOR SYSTEM FOR LOW-LEVEL 090669 P 32
DOSIMETERS* OF A SIMPLE TRITIUM MONITOR AND A TRITIUM 096879 P 34
DR3 REACTOR BY AR-41 AND XE-133* #CALIBRATION 063405 P 23
DURING PRODUCTION TESTING, JAN. 1925, 1968-DEC. 31, 1969* 068572 P 25
DYNAMIC CALIBRATION OF TRITIUM MONITORS* 024591 P 12

#BACKGROUND RATES IN TRITIUM COUNTING - THE EFFECT OF THE VIAL* 030394 P 15
#CHARACTERIZATION OF TRITIUM STACK EFFLUENT FROM A FUEL REPROCESSING PLANT* 073286 P 27
#AN INVESTIGATION OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL REPROCESSING PLANT* 061410 P 22
#MONITORING REACTOR EFFLUENTS FOR TRITIUM - PROBLEMS AND POSSIBILITIES* 068112 P 25
#MONITORING OF GASEOUS EFFLUENTS FROM REACTORS* 036925 P 16
AND ANALYTICAL CHEMISTRY, OCT. 10-11, 1972, PROGRAM AND # EIGHTEENTH ANNUAL CONFERENCE ON BIOASSAY, ENVIRONMENTAL 081594 P 31
OF AIR BY TRITIATED WATER VAPOUR AROUND THE REACTOR EL 3* #DETECTION OF THE CONTAMINATION 030689 P 15
SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS* #LIQUID SCINTILLATION 040792 P 18
#PROCEDURES FOR DETERMINATION OF STABLE ELEMENTS AND RADIONUCLIDES IN ENVIRONMENTAL SAMPLES* 005771 P 1
#MINIMUM DETECTABLE ACTIVITY OF BETA EMITTERS BY BETA SPECTRUM ANALYSIS* 077172 P 29
#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA EMITTERS* 005383 P 1
#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA EMITTERS* 030464 P 15
#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA EMITTERS* 021195 P 10
#A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES IN 007852 P 2
DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS 077945 P 30
LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR 066272 P 24
ENRICHMENT AND ASSAY OF NATURALLY OCCURRING TRITIUM* 006958 P 1
TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY, TECHNICAL REPORTS SERIES NO. 61* #LABORATORY 017268 P 9
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 14
#TRITIUM CONTAMINATION OF THE ENVIRONMENT* 075312 P 28
#MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT* 065252 P 24
ON THE VARIATION OF TRITIUM AND C-14 CONCENTRATIONS IN THE ENVIRONMENT* #STUDY 038591 P 17
PROGRAM AND #EIGHTEENTH ANNUAL CONFERENCE ON BIOASSAY, ENVIRONMENTAL AND ANALYTICAL CHEMISTRY, OCT. 10-11, 1972, 081594 P 31
ENVIRONMENTAL MONITORING TECHNIQUES* 082302 P 31
#SAMPLING AND ANALYTICAL SYSTEMS FOR MEASURING ENVIRONMENTAL RADIOACTIVITY* 070255 P 26
FOR DETERMINATION OF STABLE ELEMENTS AND RADIONUCLIDES IN ENVIRONMENTAL SAMPLES* #PROCEDURES 005771 P 1
THE DETERMINATION OF LOW-LEVEL TRITIUM IN BIOLOGICAL AND ENVIRONMENTAL SAMPLES* #FACILITY FOR 069312 P 25
#TECHNIQUES FOR MONITORING AND ANALYSIS OF ENVIRONMENTAL TRITIUM* 037365 P 17
#A NEW FAMILY OF TRITIUM MONITORING EQUIPMENT OFFERING COMPLETE PERSONNEL PROTECTION* 027925 P 13
LOW-LEVEL TRITIUM DETECTION* #A EUROPIUM-DOPED, CALCIUM-FLUORIDE SCINTILLATOR SYSTEM FOR 090669 P 32
#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA EMITTERS* 030464 P 15
#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA EMITTERS* 005383 P 1
#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA EMITTERS* 021195 P 10
DISPERSION WITH TRITIATED WATER VAPOR AS THE #GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE ATMOSPHERIC 074336 P 27
* #RAPID EVALUATION OF RADIOACTIVE SAMPLES BY GAMMA-RAY SPECTROMETRY 070249 P 26
JULY 1970* #ZIRCALOY - CLAD UO2 FUEL ROD EVALUATION PROGRAM, QUARTERLY PROGRESS REPORT II, MAY - 061489 P 22
WATER* #RADIATION-INDUCED H-T EXCHANGE IN AROMATIC HYDROCARBONS SATURATED WITH TRITIATED 041955 P 19
OF MONITORING TECHNIQUE IN JAPAN* # EXPERIENCE IN OPERATIONAL HEALTH PHYSICS AND DEVELOPMENT 056432 P 21
#SELECTED CVTR OPERATING EXPERIENCE* 023868 P 11
TRITIATED WATER VAPOR AS THE TRACER#GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE ATMOSPHERIC DISPERSION WITH 074336 P 27
LABORATORIES* #THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER NUCLEAR 006997 P 2

#CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES* 077129 P 28
BIOLOGICAL AND ENVIRONMENTAL SAMPLES* # FACILITY FOR THE DETERMINATION OF LOW-LEVEL TRITIUM IN 069312 P 25
AIR CONTAMINATION MEASUREMENT METHODS FOR NUCLEAR REACTOR FACILITY IN GERMANY* #RADIOACTIVE 008568 P 3
PERSONNEL PROTECTION* #A NEW FAMILY OF TRITIUM MONITORING EQUIPMENT OFFERIN. COMPLETE 027925 P 13
NO. 2* # FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT 004811 P 1
OXIDE AND GAS IN AMBIENT AIR #A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER FOR DIFFERENTIALLY DETERMINING TRITIUM 081436 P 30
TRITIUM OXIDE AND GAS IN #A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING 077165 P 29
TRITIUM OXIDE AND GAS IN #A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING 074953 P 27
#A RAPID FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN* 064018 P 23
#A RAPID- FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN* 043804 P 20
WATERS AND ITS APPLICATION TO METEOROLOGY AND HYDROLOGY. FINAL REPORT* OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL 028116 P 13
DETECTION OF TRITIATED WATER USING A PLASTIC-SCINTILLATOR FLOW CELL* #THE 037759 P 17
DETECTION* #A EUROPIUM-DOPED, CALCIUM- FLUORIDE SCINTILLATOR SYSTEM FOR LOW-LEVEL TRITIUM 090669 P 32
TRITIATED WATER* #INTERNAL GAS COUNTING METHOD FOR ABSOLUTE MEASUREMENTS OF THE SPECIFIC RADIOACTIVITY OF 094457 P 33
#CHARACTERIZATION OF TRITIUM STACK EFFLUENT FROM A FUEL REPROCESSING PLANT* 073286 P 27
OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL REPROCESSING PLANT* #AN INVESTIGATION 061410 P 22
MAY - JULY 1970* #ZIRCALOY - CLAD UO2 FUEL ROD EVALUATION PROGRAM, QUARTERLY PROGRESS REPORT II, 061489 P 22

#A TRITIUM PROPORTIONAL COUNTER WITH GAMMA COMPENSATION* 037755 P 17
#MEASUREMENT OF TRITIUM IN AIR IN THE PRESENCE OF GAMMA RADIATION* 013772 P 5
A TRITIUM AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-RAY DOSIMETERS* OF A SIMPLE TRITIUM MONITOR AND 096879 P 34
#RAPID EVALUATION OF RADIOACTIVE SAMPLES BY GAMMA-RAY SPECTROMETRY* 070249 P 26
TESTING SAMPLES* # GAS ANALYSIS RESULTS FOR PROJECT RULISON PRODUCTION 030136 P 14
SPECIFIC RADIOACTIVITY OF TRITIATED WATER* #INTERNAL GAS COUNTING METHOD FOR ABSOLUTE MEASUREMENTS OF THE 094457 P 33
SAMPLER FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE* ULTRASENSITIVE FIELD AIR 081436 P 30
SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE* FIELD AIR SAMPLER 074953 P 27
SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE* FIELD AIR SAMPLER 077165 P 29
#ON-LINE MONITOR OF NATURAL GAS LINES FOR HYDROGEN-3 AND KRYPTON-85* 064263 P 23
CONTINUOUS MONITORS FOR TRITIUM IN SODIUM COOLANT AND COVER GAS OF AN LMFBR* # 092878 P 32
#AN ANALYZER FOR RADIOACTIVE GAS* 006680 P 1
#TRITIUM MEASUREMENT BY GAS-SOLID CHROMATOGRAPHY* 023269 P 11
TESTING, JAN. 1925, 1968-DEC. 31, 1969* #PROJECT GASBUGGY - ON-SITE RADIOLOGICAL SAFETY DURING PRODUCTION 068572 P 25
AND XE-133* #CALIBRATION OF AIRBORNE AND GASEOUS ACTIVITY MONITORS USED IN THE DR3 REACTOR BY AR-41 063405 P 23
#MONITORING OF GASEOUS EFFLUENTS FROM REACTORS* 036925 P 16
#INSTRUMENTS FOR MONITORING LIQUID AND GASEOUS MEDIA* 031431 P 15
#ANALYSIS OF ATMOSPHERIC GASES* 057549 P 22
MONITOR FOR TRITIATED WATER VAPOR IN THE PRESENCE OF NOBLE GASES* #DEVELOPMENT OF A 082070 P 31
#MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT* 065252 P 24
GENERAL HANDBOOK FOR RADIATION MONITORING* 007577 P 2
#TRITIUM-IN-AIR GENERATOR FOR DYNAMIC CALIBRATION OF TRITIUM MONITORS* 024591 P 12

COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL- 013347 P 5
COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL- 013795 P 8
MEASUREMENT METHODS FOR NUCLEAR REACTOR FACILITY IN GERMANY* #RADIOACTIVE AIR CONTAMINATION 008568 P 3
ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE # GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE 074336 P 27
#TRITIUM IN THE GROUNDWATER IN JAPAN* 079785 P 30

TRITIATED WATER* #RADIATION-INDUCED H-T EXCHANGE IN AROMATIC HYDROCARBONS SATURATED WITH 041955 P 19
#ACCURACY OF METHODS AND INTERPRETATION OF RESULTS OF H-3 MONITORING* 029220 P 14
TRITIUM MONITORING SYSTEM IN THE DIDO AND PLUTO REACTOR HALLS* #THE INSTALLED 025984 P 12
#GENERAL HANDBOOK FOR RADIATION MONITORING* 007577 P 2
1972)* #BIBLIOGRAPHY ON HANDLING CONTROL AND MONITORING OF TRITIUM (DEC. 1968-JAN. 075963 P 28
AND VERSATILE INSTRUMENTATION FOR DETECTION OF TRITIUM HAZARD DESIGNED FOR MILITARY APPLICATION* #RELIABLE 023245 P 11
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 24
HAZARDS CONTROL PROGRESS REPORT NO. 34, MAY-AUGUST 1969* 040479 P 18
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 24
JAPAN* #EXPERIENCE IN OPERATIONAL HEALTH PHYSICS AND DEVELOPMENT OF MONITORING TECHNIQUE IN 056432 P 21
#STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT CRNL* 024740 P 12
30, 1972* #ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 077945 P 30
LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31* 066272 P 24
#RADIATION SAFETY PRACTICES - OPERATION HENRE* 061931 P 22
AT THE CHALK RIVER NUCLEAR LABORATORIES*#THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS 006997 P 2
#CONTINUOUS MONITOR FOR TRITIUM IN AIR WITH HIGH SENSITIVITY AND WIDE RANGE* 077164 P 29
#A SAMPLING SYSTEM FOR ATMOSPHERIC HT AND HTO* 094616 P 33
#A SAMPLING SYSTEM FOR ATMOSPHERIC HT AND HTO* 094616 P 33
#RADIATION-INDUCED H-T EXCHANGE IN AROMATIC HYDROCARBONS SATURATED WITH TRITIATED WATER* 041955 P 19
APPLICATION TO METEOROLOGY AND #THE MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND ITS 028116 P 13
#A RAPID-FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN* 043804 P 20
#A RAPID FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN* 064018 P 23
#ON-LINE MONITOR OF NATURAL GAS LINES FOR HYDROGEN-3 AND KRYPTON-85* 064263 P 23
#LOW-LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL APPLICATIONS* 040000 P 17
IN NATURAL WATERS AND ITS APPLICATION TO METEOROLOGY AND HYDROLOGY. FINAL REPORT* OF HYDROGEN AND OXYGEN ISOTOPES 028116 P 13

#ANALYTICAL METHODS IN OCEANOGRAPHY - I. INORGANIC METHODS* 070063 P 26
THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS 042769 P 19
OF TRITIUM CONTENT IN SAMPLES (A REVIEW) PART, I.* #DETERMINATION 008709 P 4
#THE STACK MONITOR SYSTEM AT THE IDAHO CHEMICAL PROCESSING PLANT* 089573 P 32
1968 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION* FOR 036537 P 16
UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT II. MAY - JULY 1970* #ZIRCALOY - CLAD 061489 P 22
BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION* FOR 1968 TO THE USAEC DIVISION OF 036537 P 16
MONITORS* #TRITIUM- IN-AIR GENERATOR FOR DYNAMIC CALIBRATION OF TRITIUM 024591 P 12
#A PORTABLE TRITIUM- IN-AIR MONITOR* 008679 P 3
#CALIBRATION OF TRITIUM- IN-AIR MONITORS* 008680 P 4
WITH TRITIATED WATER* #RADIATION- INDUCED H-T EXCHANGE IN AROMATIC HYDROCARBONS SATURATED 041955 P 19
#ANALYTICAL METHODS IN OCEANOGRAPHY - I. INORGANIC METHODS* 070063 P 26
REACTOR HALLS* #THE INSTALLED TRITIUM MONITORING SYSTEM IN THE DIDO AND PLUTO 025984 P 12
FOR MILITARY APPLICATION* #RELIABLE AND VERSATILE INSTRUMENTATION FOR DETECTION OF TRITIUM HAZARD DESIGNED 023245 P 11
AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION* FOR 1968 TO THE USAEC DIVISION OF BIOLOGY 036537 P 16
INSTRUMENTS FOR MONITORING LIQUID AND GASEOUS MEDIA* 031431 P 15
THE SPECIFIC RADIOACTIVITY OF TRITIATED WATER* # INTERNAL GAS COUNTING METHOD FOR ABSOLUTE MEASUREMENTS OF 094457 P 32
#ACCURACY OF METHODS AND INTERPRETATION OF RESULTS OF H-3 MONITORING* 029220 P 14
TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED 042769 P 19
#AN INVESTIGATION OF A BUBBLER TRITIUM SAMPLER* 028723 P 14
OPERATING NUCLEAR FUEL REPROCESSING PLANT* #AN INVESTIGATION OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN 061410 P 22
#THE DETECTION OF TRITIUM IN AIR WITH IONIZATION CHAMBERS* 015267 P 9
#LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH* 016938 P 9
SERIES NO. 61* #LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS 017268 P 9
METEOROLOGY AND #THE MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO 028116 P 13
OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO METEOROLOGY AND HYDROLOGY. FINAL REPORT* 028116 P 13
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 14

TRITIUM MONITOR AND A TRITIUM AMPOULE LEAK TESTER USING VA- J-15/15A TYPE X-RAY GAMMA-RAY DOSIMETERS* OF A SIMPLE 096879 P 34
BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31* CHALK RIVER NUCLEAR LABORATORIES, 066272 P 24
- ON-SITE RADIOLOGICAL SAFETY DURING PRODUCTION TESTING, JAN. 1925, 1968-DEC. 31, 1969* #PROJECT GASBUGGY 068572 P 25
ON HANDLING CONTROL AND MONITORING OF TRITIUM (DEC. 1968- JAN. 1972)* #BIBLIOGRAPHY 075963 P 28
#TRITIUM IN THE GROUNDWATER IN JAPAN* 079785 P 30
HEALTH PHYSICS AND DEVELOPMENT OF MONITORING TECHNIQUE IN JAPAN* #EXPERIENCE IN OPERATIONAL 056432 P 21

RADIONUCLIDES #A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF 007852 P 2
#ON-LINE MONITOR OF NATURAL GAS LINES FOR HYDROGEN-3 AND KRYPTON-85* 064263 P 23

#LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM- LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS* 040792 P 18
- BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. I. INTRODUCTION 042769 P 19
EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER NUCLEAR LABORATORIES* #THE MEASUREMENT OF HIGH LEVELS OF RADIATION 006997 P 2

#ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, 066272 P 24
BIOLOGY AND MEDICINE. VOLUME II. #PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC DIVISION OF 036537 P 16
ACTIVITY REMOVED FROM A CONTAMINATED SURFACE, BY DIRECT #A LABORATORY APPARATUS FOR MEASURING THE AMOUNT OF TRITIUM 009238 P 4
RADIATION IN ANIMAL RESEARCH* # LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND 016938 P 9
RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS SERIES NO. 61* # LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND 017268 P 9
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 21
#NEW APPROACH TO TRITIUM LEAK RATE DETERMINATION* 096158 P 34
#NEW APPROACH TO TRITIUM LEAK RATE DETERMINATION* 094614 P 33
OF A SIMPLE TRITIUM MONITOR AND A TRITIUM AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-RAY 096879 P 34
#METHOD FOR DETERMINING REACTOR COOLANT SYSTEM LEAKAGE* 093596 P 33
BIBLIOGRAPHIC #STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - 042769 P 19
#A PROPANE BUBBLE CHAMBER AS A LOW LEVEL COUNTER FOR TRITIUM AND CARBON-14* 036224 P 16
#A RISETIME DISCRIMINATOR FOR LOW LEVEL TRITIUM COUNTING* 081629 P 31
DOPED, CALCIUM-FLUORIDE SCINTILLATOR SYSTEM FOR LOW- LEVEL TRITIUM DETECTION* #A EUROPIUM- 090669 P 32
#FACILITY FOR THE DETERMINATION OF LOW- LEVEL TRITIUM IN BIOLOGICAL AND ENVIRONMENTAL SAMPLES* 069312 P 25
#LOW- LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL APPLICATIONS* 040000 P 17
#LOW LEVEL TRITIUM MEASURING SYSTEM* 063489 P 23
CHALK RIVER NUCLEAR LABORATORIES* #THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE 006997 P 2
STORAGE, AND DETERMINATION OF TRITIUM AT ACTIVITY LEVELS OF 10(MINUS 8TH) TO 10(MINUS 10TH) MOLE PERCENT* 013796 P 8
#MONITORING FOR TRITIUM AT LOW LEVELS* 021994 P 10
#MEASUREMENT OF TRITIUM AT NATURAL LEVELS* 013925 P 8
REPORT, APRIL 1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS 077945 P 30
HEALTH PHYSICS DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND 066272 P 24
#THE DETERMINATION OF ACCURACY AND PRECISION LIMITS FOR TRITIUM IN WATER* 066056 P 24
KRYPTON-85* #ON- LINE MONITOR OF NATURAL GAS LINES FOR HYDROGEN-3 AND 064263 P 23
#ON-LINE MONITOR OF NATURAL GAS LINES FOR HYDROGEN-3 AND KRYPTON-85* 064263 P 23
#INSTRUMENTS FOR MONITORING LIQUID AND GASEOUS MEDIA* 031431 P 15
#TRITIUM MEASUREMENTS WITH A NEW LIQUID SCINTILLATION COUNTER* 085814 P 32
#SAMPLE COMBUSTION APPARATUS FOR LIQUID SCINTILLATION COUNTING* 040773 P 18
#COMBUSTION SAMPLES FOR LIQUID SCINTILLATION COUNTING* 040774 P 18
ASSAY* #APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL BETA AND ALPHA 070252 P 26
PROTEINS SEPARATED BY DISC ELECTROPHORESIS* # LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED 040792 P 18
#ASSAY OF TRITIUM AND CARBON-14 IN ANIMAL TISSUES BY LIQUID SCINTILLATION.* 052185 P 21
#MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT* 065252 P 24
MONITORS FOR TRITIUM IN SODIUM COOLANT AND COVER GAS OF AN LMFBR* #CONTINUOUS 092878 P 32
#A PROPANE BUBBLE CHAMBER AS A LOW LEVEL COUNTER FOR TRITIUM AND CARBON-14* 036224 P 16
#A RISETIME DISCRIMINATOR FOR LOW LEVEL TRITIUM COUNTING* 081629 P 31
LOW LEVEL TRITIUM MEASURING SYSTEM* 063489 P 23
#MONITORING FOR TRITIUM AT LOW LEVELS* 021994 P 10
#APPARATUS FOR CONCENTRATION AND MEASUREMENT OF LOW TRITIUM ACTIVITIES* 013794 P 7
#A EUROPIUM-DOPED, CALCIUM-FLUORIDE SCINTILLATOR SYSTEM FOR LOW-LEVEL TRITIUM DETECTION* 090669 P 32
#FACILITY FOR THE DETERMINATION OF LOW-LEVEL TRITIUM IN BIOLOGICAL AND ENVIRONMENTAL SAMPLES* 069312 P 25
APPLICATIONS* # LOW-LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL 040000 P 17

RESEARCH* #LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL 016938 P 9
TECHNICAL REPORTS SERIES NO. 61* #LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. 017268 P 9
#SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MAPPING WITH TRITIUM* 033384 P 16
AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY 066272 P 24
#DECONTAMINATION TESTS ON TRITIUM-CONTAMINATED MATERIALS* 024286 P 11
#A TECHNIQUE FOR DEMONSTRATING C- MAX OF A PLUME USING TRITIATED MOISTURE* 061201 P 22
#HAZARDS CONTROL PROGRESS REPORT NO. 34, MAY-AUGUST 1969* 040479 P 18
MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM* 042995 P 19
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013795 P 8
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013347 P 5
#DETECTION AND MEASUREMENT (TRITIUM)* 077198 P 30
#ATMOSPHERIC TRITIUM. MEASUREMENT AND APPLICATION* 016975 P 9
#TRITIUM MEASUREMENT BY GAS-SOLID CHROMATOGRAPHY* 023269 P 11
* #RADIOACTIVE AIR CONTAMINATION MEASUREMENT METHODS FOR NUCLEAR REACTOR FACILITY IN GERMANY 008568 P 3
#CONTINUOUS SAMPLING AND MEASUREMENT OF AIRBORNE ACTIVITY. SESSION III* 007416 P 2
REPORT OF METHODS AT THE CHALK RIVER NUCLEAR #THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A 006997 P 2
WATERS AND ITS APPLICATION TO METEOROLOGY AND #THE MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL 028116 P 13
#APPARATUS FOR CONCENTRATION AND MEASUREMENT OF LOW TRITIUM ACTIVITIES* 013794 P 7
#A METHOD FOR CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR* 011470 P 4
#A METHOD FOR CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR* 011130 P 4
MEASUREMENT OF TRITIUM AT NATURAL LEVELS* 013925 P 8
MEASUREMENT OF TRITIUM CONCENTRATION OF NATURAL WATERS* 082850 P 31
RADIATION* # MEASUREMENT OF TRITIUM IN AIR IN THE PRESENCE OF GAMMA 013772 P 5
MEASUREMENT OF TRITIUM SURFACE CONTAMINATION* 021668 P 10
#LOW-LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL APPLICATIONS* 040000 P 17
#TRITIUM MEASUREMENTS IN RADIATION PROTECTION* 031396 P 15
SITES* #TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN 013806 P 8
WATER* #INTERNAL GAS COUNTING METHOD FOR ABSOLUTE MEASUREMENTS OF THE SPECIFIC RADIOACTIVITY OF TRITIATED 094457 P 33
#TRITIUM MEASUREMENTS WITH A NEW LIQUID SCINTILLATION COUNTER* 085814 P 32
#STANDARDIZATION OF NATURAL TRITIUM MEASUREMENTS.* 051081 P 20
OF SURFACES WITH TRITIUM OXIDES AND REACTIVATION MEASURES* #THE CONTROL OF THE CONTAMINATION 024192 P 11
#SAMPLING AND ANALYTICAL SYSTEMS FOR MEASURING ENVIRONMENTAL RADIOACTIVITY* 070255 P 26
#LOW LEVEL TRITIUM MEASURING SYSTEM* 063489 P 23
CONTAMINATED SURFACE, BY DIRECT #A LABORATORY APPARATUS FOR MEASURING THE AMOUNT OF TRITIUM ACTIVITY REMOVED FROM A 009238 P 4
#INSTRUMENTS FOR MONITORING LIQUID AND GASEOUS MEDIA* 031431 P 15
ANNUAL REPORT FOR 1968 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III. 036537 P 16
#THE USE OF WATER AS A SAMPLING MEDIUM FOR TRITIUM OXIDE* 026278 P 13
TOTAL TRITIUM ACTIVITY ADSORBED ON THE SURFACE OF VARIOUS METALS* #DETERMINATION OF THE 008150 P 3
OXYGEN ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO METEOROLOGY AND HYDROLOGY. FINAL REPORT* OF HYDROGEN AND 028116 P 13
RADIOACTIVITY OF TRITIATED WATER* #INTERNAL GAS COUNTING METHOD FOR ABSOLUTE MEASUREMENTS OF THE SPECIFIC 094457 P 33
* #A METHOD FOR CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR 011470 P 4

* #A	METHOD FOR CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR	011130 P 4
#	METHOD FOR DETERMINING REACTOR COOLANT SYSTEM LEAKAGE*	093596 P 33
EMITTERS* #A	METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA	021195 P 10
EMITTERS* #A	METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA	005383 P 1
EMITTERS* #A	METHOD FOR EVALUATING SURFACE CONTAMINATION OF SOFT BETA	030464 P 15
#ACCURACY OF	METHODS AND INTERPRETATION OF RESULTS OF H-3 MONITORING*	029220 P 14
OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF	METHODS AT THE CHALK RIVER NUCLEAR LABORATORIES*	006997 P 2
#RADIOACTIVE AIR CONTAMINATION MEASUREMENT	METHODS FOR NUCLEAR REACTOR FACILITY IN GERMANY*	008568 P 3
#ANALYTICAL	METHODS IN OCEANOGRAPHY - I. INORGANIC METHODS*	070063 P 26
FOR THE DETERMINATION OF RADIONUCLIDES IN #A SURVEY OF THE	METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY	007852 P 2
#ANALYTICAL METHODS IN OCEANOGRAPHY - I. INORGANIC	METHODS*	070063 P 26
FOR DETECTION OF TRITIUM HAZARD DESIGNED FOR	MILITARY APPLICATION* AND VERSATILE INSTRUMENTATION	023245 P 11
SPECTRUM ANALYSIS* #	MINIMUM DETECTABLE ACTIVITY OF BETA EMITTERS BY BETA	077172 P 29
#N S SAVANNAH CHANGE 5 -	MISC. ADMINISTRATION AND TESTING*	014861 P 9
#	MODEL 200 AC/DC AIR SAMPLER*	008455 P 3
FOR DEMONSTRATING C-MAX OF A PLUME USING TRITIATED	MOISTURE* #A TECHNIQUE	061201 P 22
AT ACTIVITY LEVELS OF 10(MINUS 8TH) TO 10(MINUS 10TH)	MOLE PERCENT* STORAGE, AND DETERMINATION OF TRITIUM	013796 P 8
15/15A TYPE X-RAY GAMMA- #CONSTRUCTION OF A SIMPLE TRITIUM	MONITOR AND A TRITIUM AMPOULE LEAK TESTER USING VA-J-	096879 P 34
GASES* #DEVELOPMENT OF A	MONITOR FOR TRITIATED WATER VAPOR IN THE PRESENCE OF NOBLE	082070 P 31
RANGE* #CONTINUOUS	MONITOR FOR TRITIUM IN AIR WITH HIGH SENSITIVITY AND WIDE	077164 P 29
#ON-LINE	MONITOR OF NATURAL GAS LINES FOR HYDROGEN-3 AND KRYPTON-85*	064263 P 23
#THE STACK	MONITOR SYSTEM AT THE IDAHO CHEMICAL PROCESSING PLANT*	089573 P 32
#A TRITIUM STACK	MONITOR WITH A WIDE DIGITAL RANGE*	066861 P 25
#TRITIUM STACK	MONITOR*	071338 P 27
#A PORTABLE TRITIUM-IN-AIR	MONITOR*	008679 P 3
#TRANSISTORISED PORTABLE TRITIUM CONTAMINATION	MONITOR*	047841 P 20
#TRITIUM	MONITOR*	049430 P 20
#A SENSITIVE TRITIUM	MONITOR.*	051956 P 21
#TECHNIQUES FOR	MONITORING AND ANALYSIS OF ENVIRONMENTAL TRITIUM*	037365 P 17
#RECENT TECHNIQUES IN TRITIUM	MONITORING BY PROPORTIONAL COUNTERS*	044996 P 20
* #A NEW FAMILY OF TRITIUM	MONITORING EQUIPMENT OFFERING COMPLETE PERSONNEL PROTECTION	027925 P 13
#	MONITORING FOR TRITIUM AT LOW LEVELS*	021994 P 10
#INSTRUMENTS FOR	MONITORING LIQUID AND GASEOUS MEDIA*	031431 P 15
#	MONITORING OF GASEOUS EFFLUENTS FROM REACTORS*	036925 P 16
#BIBLIOGRAPHY ON HANDLING CONTROL AND	MONITORING OF TRITIUM (DEC. 1968-JAN. 1972)*	075963 P 28
ENVIRONMENT* #	MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE	065252 P 24
#A SENSITIVE DETECTOR SYSTEM FOR THE CONTINUOUS	MONITORING OF TRITIUM IN THE AIR.*	094649 P 33
POSSIBILITIES* #	MONITORING REACTOR EFFLUENTS FOR TRITIUM - PROBLEMS AND	068112 P 25
#THE INSTALLED TRITIUM	MONITORING SYSTEM IN THE DIDO AND PLUTO REACTOR HALLS*	025984 P 12
#REMOTE TRITIUM AIR	MONITORING SYSTEM*	027976 P 13
EXPERIENCE IN OPERATIONAL HEALTH PHYSICS AND DEVELOPMENT OF	MONITORING TECHNIQUE IN JAPAN* #	056432 P 21
#ENVIRONMENTAL	MONITORING TECHNIQUES*	082302 P 31
#ACCURACY OF METHODS AND INTERPRETATION OF RESULTS OF H-3	MONITORING*	029220 P 14
#GENERAL HANDBOOK FOR RADIATION	MONITORING*	007577 P 2
LMFBR* #CONTINUOUS	MONITORS FOR TRITIUM IN SODIUM COOLANT AND COVER GAS OF AN	092878 P 32
#CALIBRATION OF AIRBORNE AND GASEOUS ACTIVITY	MONITORS USED IN THE DR3 REACTOR BY AR-41 AND XE-133*	063405 P 23
#CALIBRATION OF TRITIUM-IN-AIR	MONITORS*	008680 P 4
TRITIUM-IN-AIR GENERATOR FOR DYNAMIC CALIBRATION OF TRITIUM	MONITORS* #	024591 P 12
#THE	NATIONAL BUREAU OF STANDARDS TRITIATED WATER STANDARDS.*	051100 P 21
#ON-LINE MONITOR OF	NATURAL GAS LINES FOR HYDROGEN-3 AND KRYPTON-85*	064263 P 23
#MEASUREMENT OF TRITIUM AT	NATURAL LEVELS*	013925 P 8
#STANDARDIZATION OF	NATURAL TRITIUM MEASUREMENTS.*	051081 P 20
#THE MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN	NATURAL WATERS AND ITS APPLICATION TO METEOROLOGY AND	028116 P 13
#MEASUREMENT OF TRITIUM CONCENTRATION OF	NATURAL WATERS*	082850 P 31
#THE CURRENT TRITIUM CONTENTS OF	NATURAL WATERS*	061936 P 23
#ENRICHMENT AND ASSAY OF	NATURALLY OCCURRING TRITIUM*	006958 P 1
#	NEW APPROACH TO TRITIUM LEAK RATE DETERMINATION*	094614 P 33
#	NEW APPROACH TO TRITIUM LEAK RATE DETERMINATION*	096158 P 34
COMPLETE PERSONNEL PROTECTION* #A	NEW FAMILY OF TRITIUM MONITORING EQUIPMENT OFFERING	027925 P 13
#TRITIUM MEASUREMENTS WITH A	NEW LIQUID SCINTILLATION COUNTER*	085814 P 32
OF A MONITOR FOR TRITIATED WATER VAPOR IN THE PRESENCE OF	NOBLE GASES* #DEVELOPMENT	082070 P 31
DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. #PACIFIC	NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC	036537 P 16
#CHARACTERIZATION OF RADIOGASES FROM	NUCLEAR FACILITIES*	077129 P 28
OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING	NUCLEAR FUEL REPROCESSING PLANT* #AN INVESTIGATION	061410 P 22
EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER	NUCLEAR LABORATORIES* OF HIGH LEVELS OF RADIATION	006997 P 2
PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER	NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION,	066272 P 24
#RADIOACTIVE AIR CONTAMINATION MEASUREMENT METHODS FOR	NUCLEAR REACTOR FACILITY IN GERMANY*	008568 P 3
#ENRICHMENT AND ASSAY OF NATURALLY	OCCURRING TRITIUM*	006958 P 1
#ANALYTICAL METHODS IN	OCEANOGRAPHY - I. INORGANIC METHODS*	070063 P 26
ON BIOASSAY, ENVIRONMENTAL AND ANALYTICAL CHEMISTRY,	OCT. 10-11, 1972, PROGRAM AND ABSTRACTS* ANNUAL CONFERENCE	081594 P 31
#A NEW FAMILY OF TRITIUM MONITORING EQUIPMENT	OFFERING COMPLETE PERSONNEL PROTECTION*	027925 P 13
KRYPTON-85* #	ON-LINE MONITOR OF NATURAL GAS LINES FOR HYDROGEN-3 AND	064263 P 23
JAN. 1925, 1968-DEC. 31, 1969* #PROJECT GASBUGGY -	ON-SITE RADIOLOGICAL SAFETY DURING PRODUCTION TESTING,	068572 P 25
#SELECTED CVTR	OPERATING EXPERIENCE*	023868 P 11
#AN INVESTIGATION OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN	OPERATING NUCLEAR FUEL REPROCESSING PLANT*	061410 P 22
#RADIATION SAFETY PRACTICES -	OPERATION HENRE*	061931 P 22
TECHNIQUE IN JAPAN* #EXPERIENCE IN	OPERATIONAL HEALTH PHYSICS AND DEVELOPMENT OF MONITORING	056432 P 21
FIELD AIR SAMPLER FOR DIFFERENTIALLY DETERMINING TRITIUM	OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE* ULTRASENSITIVE	081436 P 30
AIR SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM	OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE* FIELD	074953 P 27
AIR SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM	OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE* FIELD	077165 P 29

#TRITIUM OXIDE* 075281 P 28
#THE USE OF WATER AS A SAMPLING MEDIUM FOR TRITIUM OXIDE* 026278 P 13
#THE CONTROL OF THE CONTAMINATION OF SURFACES WITH TRITIUM OXIDES AND DEACTIVATION MEASURES* 024192 P 11
METEOROLOGY AND HYDROLOGY. #THE MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO 028116 P 13

USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. # PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE 036537 P 16
#COUNTING OF TRITIATED COMPOUNDS ON PAPER CHROMATOGRAMS* 041898 P 19
OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION* FOR 1968 TO THE USAEC DIVISION 036537 P 16
#DETERMINATION OF TRITIUM CONTENT IN SAMPLES (A REVIEW) PART. I.* 008709 P 4
AT ACTIVITY LEVELS OF 10(MINUS 8TH) TO 10(MINUS 10TH) MOLE PERCENT* STORAGE, AND DETERMINATION OF TRITIUM 013796 P 8
FAMILY OF TRITIUM MONITORING EQUIPMENT OFFERING COMPLETE PERSONNEL PROTECTION* #A NEW 027925 P 13
TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION* FOR 1968 036537 P 16
#EXPERIENCE IN OPERATIONAL HEALTH PHYSICS AND DEVELOPMENT OF MONITORING TECHNIQUE IN JAPAN* 056432 P 21
#STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT ORNL* 024740 P 12
#ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972* 077945 P 30
CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31* 066272 P 24
OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY 042769 P 19
STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. I. INTRODUCTION - BIBLIOGRAPHIC 042769 P 19
#THE STACK MONITOR SYSTEM AT THE IDAHO CHEMICAL PROCESSING PLANT* 089573 P 32
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 24
OF TRITIUM STACK EFFLUENT FROM A FUEL REPROCESSING PLANT* #CHARACTERIZATION 073286 P 27
EFFLUENT FROM AN OPERATING NUCLEAR FUEL REPROCESSING PLANT* #AN INVESTIGATION OF AIRBORNE RADIOACTIVE 061410 P 22
#THE DETECTION OF TRITIATED WATER USING A PLASTIC-SCINTILLATOR FLOW CELL* 037759 P 17
#A TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING TRITIATED MOISTURE* 061201 P 22
#THE INSTALLED TRITIUM MONITORING SYSTEM IN THE DIDO AND PLUTO REACTOR HALLS* 025984 P 12
#TRANSISTORISED PORTABLE TRITIUM CONTAMINATION MONITOR* 047841 P 20
#A PORTABLE TRITIUM-IN-AIR MONITOR* 008679 P 3
I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. 042769 P 19
#MONITORING REACTOR EFFLUENTS FOR TRITIUM - PROBLEMS AND POSSIBILITIES* 068112 P 25
#RADIATION SAFETY PRACTICES - OPERATION HENRE* 061931 P 22
#THE DETERMINATION OF ACCURACY AND PRECISION LIMITS FOR TRITIUM IN WATER* 066056 P 24
#MEASUREMENT OF TRITIUM IN AIR IN THE PRESENCE OF GAMMA RADIATION* 013772 P 5
#DEVELOPMENT OF A MONITOR FOR TRITIATED WATER VAPOR IN THE PRESENCE OF NOBLE GASES* 082070 P 31
#MONITORING REACTOR EFFLUENTS FOR TRITIUM - PROBLEMS AND POSSIBILITIES* 068112 P 25
OF THE UPPER ATMOSPHERE* # PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION 025597 P 12
WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* 042769 P 19
RADIONUCLIDES IN ENVIRONMENTAL SAMPLES* # PROCEDURES FOR DETERMINATION OF STABLE ELEMENTS AND 005771 P 1
#THE STACK MONITOR SYSTEM AT THE IDAHO CHEMICAL PROCESSING PLANT* 089573 P 32
#GAS ANALYSIS RESULTS FOR PROJECT RULISON PRODUCTION TESTING SAMPLES* 030136 P 14
#PROJECT GASBUGGY - ON-SITE RADIOLOGICAL SAFETY DURING PRODUCTION TESTING, JAN. 1925, 1968-DEC. 31, 1969* 068572 P 25
#ZIRCALOY - CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT II, MAY - JULY 1970* 061489 P 22
PRODUCTION TESTING, JAN. 1925, 1968-DEC. 31, 1969* # PROJECT GASBUGGY - ON-SITE RADIOLOGICAL SAFETY DURING 068572 P 25
#GAS ANALYSIS RESULTS FOR PROJECT RULISON PRODUCTION TESTING SAMPLES* 030136 P 14
AND CARBON-14* #A PROPANE BUBBLE CHAMBER AS A LOW LEVEL COUNTER FOR TRITIUM 036224 P 16
#A TRITIUM PROPORTIONAL COUNTER WITH GAMMA COMPENSATION* 037755 P 17
#RECENT TECHNIQUES IN TRITIUM MONITORING BY PROPORTIONAL COUNTERS* 044996 P 20
CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM 013347 P 5
CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM 013795 P 8
#MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM* 042995 P 19
#TRITIUM MEASUREMENTS IN RADIATION PROTECTION* 031396 P 15
OF TRITIUM MONITORING EQUIPMENT OFFERING COMPLETE PERSONNEL PROTECTION* #A NEW FAMILY 027925 P 13
#LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS* 040792 P 18

#RESEARCH ON AVALANCHE TYPE SEMICONDUCTOR RADIATION DETECTORS* 056070 P 21
RIVER NUCLEAR #THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE CHALK 006997 P 2
#LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH* 016938 P 9
#LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS SERIES NO. 61* 017268 P 9
#GENERAL HANDBOOK FOR RADIATION MONITORING* 007577 P 2
#TRITIUM MEASUREMENTS IN RADIATION PROTECTION* 031396 P 15
RADIATION SAFETY PRACTICES - OPERATION HENRE* 061931 P 22
#MEASUREMENT OF TRITIUM IN AIR IN THE PRESENCE OF GAMMA RADIATION* 013772 P 5
SATURATED WITH TRITIATED WATER* # RADIATION-INDUCED H-T EXCHANGE IN AROMATIC HYDROCARBONS 041955 P 19
NUCLEAR REACTOR FACILITY IN GERMANY* # RADIOACTIVE AIR CONTAMINATION MEASUREMENT METHODS FOR 008568 P 3
#FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2* 004811 P 1
#PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE* 025597 P 12
REPROCESSING PLANT* #AN INVESTIGATION OF AIRBORNE RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL 061410 P 22
#AN ANALYZER FOR RADIOACTIVE GAS* 006680 P 1
#RAPID EVALUATION OF RADIOACTIVE SAMPLES BY GAMMA-RAY SPECTROMETRY* 070249 P 26
COUNTING METHOD FOR ABSOLUTE MEASUREMENTS OF THE SPECIFIC RADIOACTIVITY OF TRITIATED WATER* #INTERNAL GAS 094457 P 33
SAMPLING AND ANALYTICAL SYSTEMS FOR MEASURING ENVIRONMENTAL RADIOACTIVITY* # 070255 P 26
#CHARACTERIZATION OF RADIOGASES FROM NUCLEAR FACILITIES* 077129 P 28
1968-DEC. 31, 1969* #PROJECT GASBUGGY - ON-SITE RADIOLOGICAL SAFETY DURING PRODUCTION TESTING, JAN. 1925, 068572 P 25
#PROCEDURES FOR DETERMINATION OF STABLE ELEMENTS AND RADIONUCLIDES IN ENVIRONMENTAL SAMPLES* 005771 P 1
KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES IN URINE* OF THE METHODS USED IN THE UNITED 007852 P 2
#A TRITIUM STACK MONITOR WITH A WIDE DIGITAL RANGE* 066861 P 25
MONITOR FOR TRITIUM IN AIR WITH HIGH SENSITIVITY AND WIDE RANGE* #CONTINUOUS 077164 P 29
SPECTROMETRY* # RAPID EVALUATION OF RADIOACTIVE SAMPLES BY GAMMA-RAY 070249 P 26
HYDROGEN* #A RAPID FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC 064018 P 23
HYDROGEN* #A RAPID-FIELD SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC 043804 P 20
#NEW APPROACH TO TRITIUM LEAK RATE DETERMINATION* 094614 P 33
#NEW APPROACH TO TRITIUM LEAK RATE DETERMINATION* 096158 P 34
#BACKGROUND RATES IN TRITIUM COUNTING - THE EFFECT OF THE VIAL* 030394 P 15

AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-
AND A TRITIUM AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-
#RAPID EVALUATION OF RADIOACTIVE SAMPLES BY GAMMA-
OF AIRBORNE AND GASEOUS ACTIVITY MONITORS USED IN THE DR3
#METHOD FOR DETERMINING
#MONITORING
CONTAMINATION OF AIR BY TRITIATED WATER VAPOUR AROUND THE
AIR CONTAMINATION MEASUREMENT METHODS FOR NUCLEAR
INSTALLED TRITIUM MONITORING SYSTEM IN THE DIDO AND PLUTO
#MONITORING OF GASEOUS EFFLUENTS FROM
COUNTERS* #
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON
TRITIUM HAZARD DESIGNED FOR MILITARY APPLICATION* #
APPARATUS FOR MEASURING THE AMOUNT OF TRITIUM ACTIVITY
LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS
THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL
#CHARACTERIZATION OF TRITIUM STACK EFFLUENT FROM A FUEL
RADIOACTIVE EFFLUENT FROM AN OPERATING NUCLEAR FUEL
DETECTORS* #
MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL
#GAS ANALYSIS
#ACCURACY OF METHODS AND INTERPRETATION OF
#DETERMINATION OF TRITIUM CONTENT IN SAMPLES (A
#A
OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE CHALK
DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH
TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN
TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN
TECHNIQUES FOR THE USE AND CONTROL OF TRITIUM AT SAVANNAH
JULY 1970* #ZIRCALOY - CLAD UO2 FUEL
DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN #A
DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN #A
DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND GAS IN #A
#GAS ANALYSIS RESULTS FOR PROJECT
RAY DOSIMETERS* OF A SIMPLE TRITIUM MONITOR AND A TRITIUM 096879 P 34
RAY GAMMA-RAY DOSIMETERS* OF A SIMPLE TRITIUM MONITOR 096879 P 34
RAY SPECTROMETRY* 070249 P 26
REACTOR BY AR-41 AND XE-133* #CALIBRATION 063405 P 23
REACTOR COOLANT SYSTEM LEAKAGE* 093596 P 33
REACTOR EFFLUENTS FOR TRITIUM - PROBLEMS AND POSSIBILITIES* 068112 P 25
REACTOR EL 3* #DETECTION OF THE 030689 P 15
REACTOR FACILITY IN GERMANY* #RADIOACTIVE 008568 P 3
REACTOR HALLS* #THE 025984 P 12
REACTORS* 036925 P 16
RECENT TECHNIQUES IN TRITIUM MONITORING BY PROPORTIONAL 044996 P 20
RELEASE TO THE ENVIRONMENT* 030129 P 14
RELIABLE AND VERSATILE INSTRUMENTATION FOR DETECTION OF 023245 P 11
REMOTE TRITIUM AIR MONITORING SYSTEM* 027976 P 13
REMOVED FROM A CONTAMINATED SURFACE, BY DIRECT CONTACT 009238 P 4
REPORT, APRIL 1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA 077945 P 30
REPORTS SERIES NO. 61* #LABORATORY TRAINING MANUAL ON 017268 P 9
REPROCESSING PLANT* 073286 P 27
REPROCESSING PLANT* #AN INVESTIGATION OF AIRBORNE 061410 P 22
RESEARCH ON AVALANCHE TYPE SEMICONDUCTOR RADIATION 056070 P 21
RESEARCH* #LABORATORY TRAINING 016938 P 9
RESULTS FOR PROJECT RULISON PRODUCTION TESTING SAMPLES* 030136 P 14
RESULTS OF H-3 MONITORING* 029220 P 14
REVIEW) PART, I.* 008709 P 4
RISETIME DISCRIMINATOR FOR LOW LEVEL TRITIUM COUNTING* 081629 P 31
RIVER NUCLEAR LABORATORIES*#THE MEASUREMENT OF HIGH LEVELS 006997 P 2
RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS 066272 P 24
RIVER PLANT* 064768 P 24
RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING 013347 P 5
RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING 013795 P 8
RIVER* #ANALYTICAL 043089 P 19
ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT II, MAY - 061489 P 22
RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER FOR 081436 P 30
RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR 077165 P 29
RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR 074953 P 27
RULISON PRODUCTION TESTING SAMPLES* 030136 P 14

1969* #PROJECT GASBUGGY - ON-SITE RADIOLOGICAL
#RADIATION
COUNTING* #
GAS IN AMBIENT AIR #A RUGGEDIZED ULTRASENSITIVE FIELD AIR
OXIDE AND GAS IN #A RUGGEDIZED ULTRASENSITIVE FIELD AIR
OXIDE AND GAS IN #A RUGGEDIZED ULTRASENSITIVE FIELD AIR
#AN INVESTIGATION OF A BUBBLER TRITIUM
#MODEL 200 AC/DC AIR
#DETERMINATION OF TRITIUM CONTENT IN
#RAPID EVALUATION OF RADIOACTIVE
#COMBUSTION
GAS ANALYSIS RESULTS FOR PROJECT RULISON PRODUCTION TESTING
OF STABLE ELEMENTS AND RADIONUCLIDES IN ENVIRONMENTAL
OF LOW-LEVEL TRITIUM IN BIOLOGICAL AND ENVIRONMENTAL
ENVIRONMENTAL RADIOACTIVITY* #
#CONTINUOUS
#THE USE OF WATER AS A
#A
#A RAPID FIELD
#A RAPID-FIELD
#A COLD STRIP APPARATUS FOR
#RADIATION-INDUCED H-T EXCHANGE IN AROMATIC HYDROCARBONS
#N S
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE
ANALYTICAL TECHNIQUES FOR THE USE AND CONTROL OF TRITIUM AT
USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL
#TRITIUM MEASUREMENTS WITH A NEW LIQUID
#COMBUSTION SAMPLES FOR LIQUID
#SAMPLE COMBUSTION APPARATUS FOR LIQUID
#APPLICATION OF LIQUID
SEPARATED BY DISC ELECTROPHORESIS* #LIQUID
#ASSAY OF TRITIUM AND CARBON-14 IN ANIMAL TISSUES BY LIQUID
#THE DETECTION OF TRITIATED WATER USING A PLASTIC-
#A EUROPIUM-DOPED, CALCIUM-FLUORIDE
#
#RESEARCH ON AVALANCHE TYPE
TRITIUM IN THE AIR.* #A
#A
#CONTINUOUS MONITOR FOR TRITIUM IN AIR WITH HIGH
SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED PROTEINS
OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS
#CONTINUOUS SAMPLING AND MEASUREMENT OF AIRBORNE ACTIVITY.
USING VA-J-15/15A TYPE X-RAY GAMMA-RAY #CONSTRUCTION OF A
TRITIUM* #
1925, 1968-DEC. 31, 1969* #PROJECT GASBUGGY - ON-
MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN
#CONTINUOUS MONITORS FOR TRITIUM IN
#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF
SAFETY DURING PRODUCTION TESTING, JAN. 1925, 1968-DEC. 31, 068572 P 25
SAFETY PRACTICES - OPERATION HENRE* 061931 P 22
SAMPLE COMBUSTION APPARATUS FOR LIQUID SCINTILLATION 040773 P 18
SAMPLER FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND 081436 P 30
SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM 077165 P 29
SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM 074953 P 27
SAMPLER* 028723 P 14
SAMPLER* 008455 P 3
SAMPLES (A REVIEW) PART, I.* 008709 P 4
SAMPLES BY GAMMA-RAY SPECTROMETRY* 070249 P 26
SAMPLES FOR LIQUID SCINTILLATION COUNTING* 040774 P 18
SAMPLES* # 030136 P 14
SAMPLES* #PROCEDURES FOR DETERMINATION 005771 P 1
SAMPLES* #FACILITY FOR THE DETERMINATION 069312 P 25
SAMPLING AND ANALYTICAL SYSTEMS FOR MEASURING 070255 P 26
SAMPLING AND MEASUREMENT OF AIRBORNE ACTIVITY. SESSION III* 007416 P 2
SAMPLING MEDIUM FOR TRITIUM OXIDE* 026278 P 13
SAMPLING SYSTEM FOR ATMOSPHERIC HT AND HTO* 094616 P 33
SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN* 064018 P 23
SAMPLING SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN* 043804 P 20
SAMPLING TRITIUM IN AIR* 007680 P 2
SATURATED WITH TRITIATED WATER* 041955 P 19
SAVANNAH CHANGE 5 - MISC. ADMINISTRATION AND TESTING* 014861 P 9
SAVANNAH RIVER PLANT* 064768 P 24
SAVANNAH RIVER* # 043089 P 19
SCIENCES. PART. III. INSTRUMENTATION* FOR 1968 TO THE 036537 P 16
SCINTILLATION COUNTER* 085814 P 32
SCINTILLATION COUNTING* 040774 P 18
SCINTILLATION COUNTING* 040773 P 18
SCINTILLATION SPECTROMETRY FOR TOTAL BETA AND ALPHA ASSAY* 070252 P 26
SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED PROTEINS 040792 P 18
SCINTILLATION.* 052185 P 21
SCINTILLATOR FLOW CELL* 037759 P 17
SCINTILLATOR SYSTEM FOR LOW-LEVEL TRITIUM DETECTION* 090669 P 32
SELECTED CVTR OPERATING EXPERIENCE* 023868 P 11
SEMICONDUCTOR RADIATION DETECTORS* 056070 P 21
SENSITIVE DETECTOR SYSTEM FOR THE CONTINUOUS MONITORING OF 094649 P 33
SENSITIVE TRITIUM MONITOR.* 051956 P 21
SENSITIVITY AND WIDE RANGE* 077164 P 29
SEPARATED BY DISC ELECTROPHORESIS* #LIQUID 040792 P 18
SERIES NO. 61* #LABORATORY TRAINING MANUAL ON THE USE 017268 P 9
SESSION III* 007416 P 2
SIMPLE TRITIUM MONITOR AND A TRITIUM AMPOULE LEAK TESTER 096879 P 34
SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MAPPING WITH 033384 P 16
SITE RADIOLOGICAL SAFETY DURING PRODUCTION TESTING, JAN. 068572 P 25
SITES* #TRITIUM 013806 P 8
SODIUM COOLANT AND COVER GAS OF AN LMFBR* 092878 P 32
SOFT BETA EMITTERS* 021195 P 10

#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF	SOFT BETA EMITTERS*	005383 P
#A METHOD FOR EVALUATING SURFACE CONTAMINATION OF	SOFT BETA EMITTERS*	030464 P 15
#TRITIUM MEASUREMENT BY GAS-	SOLID CHROMATOGRAPHY*	023269 P 11
#TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN	SOME SOUTH AFRICAN SITES*	013806 P 8
ENVIRONMENT* #	SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE	030129 P 14
#TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME	SOUTH AFRICAN SITES*	013806 P 8
GAS COUNTING METHOD FOR ABSOLUTE MEASUREMENTS OF THE	SPECIFIC RADIOACTIVITY OF TRITIATED WATER* #INTERNAL	094457 P 33
#APPLICATION OF LIQUID SCINTILLATION	SPECTROMETRY FOR TOTAL BETA AND ALPHA ASSAY*	070252 P 26
ELECTROPHORESIS* #LIQUID SCINTILLATION	SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC	040792 P 18
#RAPID EVALUATION OF RADIOACTIVE SAMPLES BY GAMMA-RAY	SPECTROMETRY*	070249 P 26
#MINIMUM DETECTABLE ACTIVITY OF BETA EMITTERS BY BETA	SPECTRUM ANALYSIS*	077172 P 29
#PROCEDURES FOR DETERMINATION OF	STABLE ELEMENTS AND RADIONUCLIDES IN ENVIRONMENTAL SAMPLES*	005771 P 1
#SIMPLIFIED TECHNIQUE FOR	STACK DISPERSION MAPPING WITH TRITIUM*	033384 P 16
#CHARACTERIZATION OF TRITIUM	STACK EFFLUENT FROM A FUEL REPROCESSING PLANT*	073286 P 27
* #THE	STACK MONITOR SYSTEM AT THE IDAHO CHEMICAL PROCESSING PLANT	089573 P 32
#A TRITIUM	STACK MONITOR WITH A WIDE DIGITAL RANGE*	066861 P 25
#TRITIUM	STACK MONITOR*	071338 P 27
#	STANDARDIZATION OF NATURAL TRITIUM MEASUREMENTS.*	051081 P 20
#THE NATIONAL BUREAU OF	STANDARDS TRITIATED WATER STANDARDS.*	051100 P 21
#THE NATIONAL BUREAU OF STANDARDS TRITIATED WATER	STANDARDS.*	051100 P 21
#	STATUS AND PROGRESS REPORT*	013784 P 7
#	STATUS AND PROGRESS REPORT*	013783 P 7
#	STATUS AND PROGRESS REPORT*	013782 P 7
#	STATUS AND PROGRESS REPORT*	013781 P 6
#	STATUS AND PROGRESS REPORT*	013780 P 6
#	STATUS AND PROGRESS REPORT*	013779 P 6
#	STATUS AND PROGRESS REPORT*	013778 P 6
#	STATUS AND PROGRESS REPORT*	013777 P 6
#	STATUS AND PROGRESS REPORT*	013776 P 5
#	STATUS AND PROGRESS REPORT*	013775 P 5
OF 10(MINUS 8TH) TO 10(MINUS 10TH) MOLE #CONCENTRATION,	STORAGE, AND DETERMINATION OF TRITIUM AT ACTIVITY LEVELS	013796 P 8
#A COLD	STRIP APPARATUS FOR SAMPLING TRITIUM IN AIR*	007680 P 2
#	STUDIES AND TECHNIQUES IN TRITIUM HEALTH PHYSICS AT ORNL*	024740 P 12
TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF #	STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH	042769 P 19
#PROBLEMS ARISING IN THE	STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE*	025597 P 12
WITH TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC	STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN	042769 P 19
IN THE ENVIRONMENT* #	STUDY ON THE VARIATION OF TRITIUM AND C-14 CONCENTRATIONS	038591 P 17
#TRITIUM MEASUREMENTS OF	SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES*	013806 P 8
#A METHOD FOR EVALUATING	SURFACE CONTAMINATION OF SOFT BETA EMITTERS*	021195 P 10
#A METHOD FOR EVALUATING	SURFACE CONTAMINATION OF SOFT BETA EMITTERS*	005383 P 1
#A METHOD FOR EVALUATING	SURFACE CONTAMINATION OF SOFT BETA EMITTERS*	030464 P 15
#MEASUREMENT OF TRITIUM	SURFACE CONTAMINATION*	021668 P 10
DETERMINATION OF THE TOTAL TRITIUM ACTIVITY ADSORBED ON THE	SURFACE OF VARIOUS METALS* #	008150 P 3
FROM A CONTAMINATED SURFACE, BY DIRECT CONTACT WITH THE	SURFACE* MEASURING THE AMOUNT OF TRITIUM ACTIVITY REMOVED	009238 P 4
THE AMOUNT OF TRITIUM ACTIVITY REMOVED FROM A CONTAMINATED	SURFACE, BY DIRECT CONTACT WITH THE SURFACE* FOR MEASURING	009238 P 4
#THE CONTROL OF THE CONTAMINATION OF	SURFACES WITH TRITIUM OXIDES AND DEACTIVATION MEASURES*	024192 P 11
ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES #A	SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC	007952 P 2
#THE 1971 TRITIUM	SYMPOSIUM AT LAS VEGAS*	055111 P 21
#THE STACK MONITOR	SYSTEM AT THE IDAHO CHEMICAL PROCESSING PLANT*	089573 P 32
#A SAMPLING	SYSTEM FOR ATMOSPHERIC HT AND HTO*	094616 P 33
GAS IN #A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER	SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND	077165 P 29
GAS IN #A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER	SYSTEM FOR DIFFERENTIALLY DETERMINING TRITIUM OXIDE AND	074953 P 27
#A EUROPIUM-DOPED, CALCIUM-FLUORIDE SCINTILLATOR	SYSTEM FOR LOW-LEVEL TRITIUM DETECTION*	090669 P 32
* #A SENSITIVE DETECTOR	SYSTEM FOR THE CONTINUOUS MONITORING OF TRITIUM IN THE AIR.	094649 P 33
#A RAPID FIELD SAMPLING	SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN*	064018 P 23
#A RAPID-FIELD SAMPLING	SYSTEM FOR TRITIUM IN ATMOSPHERIC HYDROGEN*	043804 P 20
#THE INSTALLED TRITIUM MONITORING	SYSTEM IN THE DIDO AND PLUTO REACTOR HALLS*	025984 P 12
#METHOD FOR DETERMINING REACTOR COOLANT	SYSTEM LEAKAGE*	093596 P 33
#REMOTE TRITIUM AIR MONITORING	SYSTEM*	027976 P 13
#LOW LEVEL TRITIUM MEASURING	SYSTEM*	063489 P 23
#SAMPLING AND ANALYTICAL	SYSTEMS FOR MEASURING ENVIRONMENTAL RADIOACTIVITY*	070255 P 26
TRITIATED MOISTURE* #A	TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING	061201 P 22
#SIMPLIFIED	TECHNIQUE FOR STACK DISPERSION MAPPING WITH TRITIUM*	033384 P 16
IN OPERATIONAL HEALTH PHYSICS AND DEVELOPMENT OF MONITORING	TECHNIQUE IN JAPAN* #EXPERIENCE	056432 P 21
GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING	TECHNIQUE* #TRITIUM CONCENTRATION OF	013795 P 8
GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING	TECHNIQUE* #TRITIUM CONCENTRATION OF	013347 P 5
TRITIUM* #	TECHNIQUES FOR MONITORING AND ANALYSIS OF ENVIRONMENTAL	037365 P 17
RIVER* #ANALYTICAL	TECHNIQUES FOR THE USE AND CONTROL OF TRITIUM AT SAVANNAH	043089 P 19
#STUDIES AND	TECHNIQUES IN TRITIUM HEALTH PHYSICS AT ORNL*	024740 P 12
#RECENT	TECHNIQUES IN TRITIUM MONITORING BY PROPORTIONAL COUNTERS*	044996 P 20
#ENVIRONMENTAL MONITORING	TECHNIQUES*	082302 P 31
#TRITIUM CONTROL	TECHNOLOGY*	094798 P 34
OF A SIMPLE TRITIUM MONITOR AND A TRITIUM AMPOULE LEAK	TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-RAY DOSIMETERS*	096879 P 34
#GAS ANALYSIS RESULTS FOR PROJECT RULISON PRODUCTION	TESTING SAMPLES*	030136 P 14
#N S SAVANNAH CHANGE 5 - MISC. ADMINISTRATION AND	TESTING*	014861 P 9
GASBUGGY - ON-SITE RADIOLOGICAL SAFETY DURING PRODUCTION	TESTING, JAN. 1925, 1968-DEC. 31, 1969* #PROJECT	068572 P 25
#DECONTAMINATION	TESTS ON TRITIUM-CONTAMINATED MATERIALS*	024286 P 11
#ASSAY OF TRITIUM AND CARBON-14 IN ANIMAL	TISSUES BY LIQUID SCINTILLATION.*	052185 P 21
#APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR	TOTAL BETA AND ALPHA ASSAY*	070252 P 26
METALS* #DETERMINATION OF THE	TOTAL TRITIUM ACTIVITY ADSORBED ON THE SURFACE OF VARIOUS	008150 P 3
ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE	TRACER* #GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE	074336 P 27
ENTOMOLOGY, TECHNICAL REPORTS SERIES NO. 61* #LABORATORY	TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN	017268 P 9
ANIMAL RESEARCH* #LABORATORY	TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN	016938 P 9
INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE #STUDIES ON THE	TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I.	042769 P 19

#COUNTING OF	TRITIATED COMPOUNDS ON PAPER CHROMATOGRAMS*	041898 P 19
#A TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING	TRITIATED MOISTURE*	061201 P 22
#A METHOD FOR CONTINUOUS MEASUREMENT OF	TRITIATED WATER IN AIR*	011470 P 4
#A METHOD FOR CONTINUOUS MEASUREMENT OF	TRITIATED WATER IN AIR*	011130 P 4
#THE NATIONAL BUREAU OF STANDARDS	TRITIATED WATER STANDARDS.*	051100 P 21
#THE DETECTION OF	TRITIATED WATER USING A PLASTIC-SCINTILLATOR FLOW CELL*	037759 P 17
OF EXPERIMENTS TO DETERMINE ATMOSPHERIC DISPERSION WITH	TRITIATED WATER VAPOR AS THE TRACER* #GRAPHICAL EVALUATION	074336 P 27
#DEVELOPMENT OF A MONITOR FOR	TRITIATED WATER VAPOR IN THE PRESENCE OF NOBLE GASES*	082070 P 31
#DETECTION OF THE CONTAMINATION OF AIR BY	TRITIATED WATER VAPOUR AROUND THE REACTOR EL 3*	030689 P 15
THE #STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH	TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF	042769 P 19
H-T EXCHANGE IN AROMATIC HYDROCARBONS SATURATED WITH	TRITIATED WATER* #RADIATION-INDUCED	041955 P 19
FOR ABSOLUTE MEASUREMENTS OF THE SPECIFIC RADICACTIVITY OF	TRITIATED WATER* #INTERNAL GAS COUNTING METHOD	094457 P 33
#BIBLIOGRAPHY ON HANDLING CONTROL AND MONITORING OF	TRITIUM (DEC. 1968-JAN. 1972)*	075963 P 28
#MONITORING REACTOR EFFLUENTS FOR	TRITIUM - PROBLEMS AND POSSIBILITIES*	068112 P 25
#APPARATUS FOR CONCENTRATION AND MEASUREMENT OF LOW	TRITIUM ACTIVITIES*	013794 P 7
#DETERMINATION OF THE TOTAL	TRITIUM ACTIVITY ADSORBED ON THE SURFACE OF VARIOUS METALS*	008150 P 3
DIRECT #A LABORATORY APPARATUS FOR MEASURING THE AMOUNT OF	TRITIUM ACTIVITY REMOVED FROM A CONTAMINATED SURFACE, BY	009238 P 4
#REMOTE	TRITIUM AIR MONITORING SYSTEM*	027976 P 13
GAMMA-RAY #CONSTRUCTION OF A SIMPLE TRITIUM MONITOR AND A	TRITIUM AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY	096879 P 34
#STUDY ON THE VARIATION OF	TRITIUM AND C-14 CONCENTRATIONS IN THE ENVIRONMENT*	038591 P 17
SCINTILLATION.* #ASSAY OF	TRITIUM AND CARBON-14 IN ANIMAL TISSUES BY LIQUID	052185 P 21
#A PROPANE BUBBLE CHAMBER AS A LOW LEVEL COUNTER FOR	TRITIUM AND CARBON-14*	036224 P 16
#SOURCES OF	TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT*	030129 P 14
10TH) MOLE #CONCENTRATION, STORAGE, AND DETERMINATION OF	TRITIUM AT ACTIVITY LEVELS OF 10(MINUS 8TH) TO 10(MINUS	013796 P 8
#MONITORING FOR	TRITIUM AT LOW LEVELS*	021994 P 10
#MEASUREMENT OF	TRITIUM AT NATURAL LEVELS*	013925 P 8
#ANALYTICAL TECHNIQUES FOR THE USE AND CONTROL OF	TRITIUM AT SAVANNAH RIVER*	043089 P 19
THE PROPORTIONAL-COUNTING TECHNIQUE* #	TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH	013795 P 8
THE PROPORTIONAL-COUNTING TECHNIQUE* #	TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH	013347 P 5
#MEASUREMENT OF	TRITIUM CONCENTRATION OF NATURAL WATERS*	082850 P 31
#TRANSISTORISED PORTABLE	TRITIUM CONTAMINATION MONITOR*	047841 P 20
#	TRITIUM CONTAMINATION OF THE ENVIRONMENT*	075312 P 28
#DETERMINATION OF	TRITIUM CONTENT IN SAMPLES (A REVIEW) PART, I.*	008709 P 4
#THE CURRENT	TRITIUM CONTENTS OF NATURAL WATERS*	061936 P 23
#	TRITIUM CONTROL TECHNOLOGY*	094798 P 34
#BACKGROUND RATES IN	TRITIUM COUNTING - THE EFFECT OF THE VIAL*	030394 P 15
#A RISETIME DISCRIMINATOR FOR LOW LEVEL	TRITIUM COUNTING*	081629 P 31
DOPED, CALCIUM-FLUORIDE SCINTILLATOR SYSTEM FOR LOW-LEVEL	TRITIUM DETECTION* #A EUROPIUM-	090669 P 32
#RELIABLE AND VERSATILE INSTRUMENTATION FOR DETECTION OF	TRITIUM HAZARD DESIGNED FOR MILITARY APPLICATION*	023245 P 11
#CONTROL OF	TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT*	064768 P 24
#STUDIES AND TECHNIQUES IN	TRITIUM HEALTH PHYSICS AT ORNL*	024740 P 12
#MEASUREMENT OF	TRITIUM IN AIR IN THE PRESENCE OF GAMMA RADIATION*	013772 P 5
#CONTINUOUS MONITOR FOR	TRITIUM IN AIR WITH HIGH SENSITIVITY AND WIDE RANGE*	077164 P 29
#THE DETECTION OF	TRITIUM IN AIR WITH IONIZATION CHAMBERS*	015267 P 9
#A COLD STRIP APPARATUS FOR SAMPLING	TRITIUM IN AIR*	007680 P 2
#A RAPID FIELD SAMPLING SYSTEM FOR	TRITIUM IN ATMOSPHERIC HYDROGEN*	064018 P 23
#A RAPID-FIELD SAMPLING SYSTEM FOR	TRITIUM IN ATMOSPHERIC HYDROGEN*	043804 P 20
#FACILITY FOR THE DETERMINATION OF LOW-LEVEL	TRITIUM IN BIOLOGICAL AND ENVIRONMENTAL SAMPLES*	069312 P 25
#MONITORING OF	TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT*	065252 P 24
#CONTINUOUS MONITORS FOR	TRITIUM IN SODIUM COOLANT AND COVER GAS OF AN LMFBR*	092878 P 32
SENSITIVE DETECTOR SYSTEM FOR THE CONTINUOUS MONITORING OF	TRITIUM IN THE AIR.* #A	094649 P 33
#	TRITIUM IN THE GROUNDWATER IN JAPAN*	079785 P 30
#THE DETERMINATION OF ACCURACY AND PRECISION LIMITS FOR	TRITIUM IN WATER*	066056 P 24
#NEW APPROACH TO	TRITIUM LEAK RATE DETERMINATION*	096158 P 34
#NEW APPROACH TO	TRITIUM LEAK RATE DETERMINATION*	094614 P 33
#	TRITIUM MEASUREMENT BY GAS-SOLID CHROMATOGRAPHY*	023269 P 11
#LOW-LEVEL	TRITIUM MEASUREMENTS FOR HYDROLOGICAL APPLICATIONS*	040000 P 17
#	TRITIUM MEASUREMENTS IN RADIATION PROTECTION*	031396 P 15
AFRICAN SITES* #	TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH	013806 P 8
COUNTER* #	TRITIUM MEASUREMENTS WITH A NEW LIQUID SCINTILLATION	085814 P 32
#STANDARDIZATION OF NATURAL	TRITIUM MEASUREMENTS.*	051081 P 20
#LOW LEVEL	TRITIUM MEASURING SYSTEM*	063489 P 23
J-15/15A TYPE X-RAY GAMMA-RAY #CONSTRUCTION OF A SIMPLE	TRITIUM MONITOR AND A TRITIUM AMPOULE LEAK TESTER USING VA-	096879 P 34
#A SENSITIVE	TRITIUM MONITOR.*	051956 P 21
#	TRITIUM MONITOR*	049430 P 20
#RECENT TECHNIQUES IN	TRITIUM MONITORING BY PROPORTIONAL COUNTERS*	044996 P 20
PROTECTION* #A NEW FAMILY OF	TRITIUM MONITORING EQUIPMENT OFFERING COMPLETE PERSONNEL	027925 P 13
HALLS* #THE INSTALLED	TRITIUM MONITORING SYSTEM IN THE DIDO AND PLUTO REACTOR	025984 P 12
#TRITIUM-IN-AIR GENERATOR FOR DYNAMIC CALIBRATION OF	TRITIUM MONITORS*	024591 P 12
FIELD AIR SAMPLER FOR DIFFERENTIALLY DETERMINING	TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE*	081436 P 30
FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING	TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE*	074953 P 27
FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY DETERMINING	TRITIUM OXIDE AND GAS IN AMBIENT AIR ATMOSPHERE*	077165 P 29
#	TRITIUM OXIDE*	075281 P 28
#THE USE OF WATER AS A SAMPLING MEDIUM FOR	TRITIUM OXIDE*	026278 P 13
#THE CONTROL OF THE CONTAMINATION OF SURFACES WITH	TRITIUM OXIDES AND DEACTIVATION MEASURES*	024192 P 11
#A	TRITIUM PROPORTIONAL COUNTER WITH GAMMA COMPENSATION*	037755 P 17
#AN INVESTIGATION OF A BUBBLER	TRITIUM SAMPLER*	028723 P 14
#CHARACTERIZATION OF	TRITIUM STACK EFFLUENT FROM A FUEL REPROCESSING PLANT*	073286 P 27
#A	TRITIUM STACK MONITOR WITH A WIDE DIGITAL RANGE*	066861 P 25
#	TRITIUM STACK MONITOR*	071338 P 27
#MEASUREMENT OF	TRITIUM SURFACE CONTAMINATION*	021668 P 10
#THE 1971	TRITIUM SYMPOSIUM AT LAS VEGAS*	055111 P 21
#TECHNIQUES FOR MONITORING AND ANALYSIS OF ENVIRONMENTAL	TRITIUM*	037365 P 17
#MEANS OF DETECTING AND PROTECTING AGAINST	TRITIUM*	042995 P 19
#SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MAPPING WITH	TRITIUM*	033384 P 16
#ENRICHMENT AND ASSAY OF NATURALLY OCCURRING	TRITIUM*	006958 P 1
#	TRITIUM*	077191 P 29

#ATMOSPHERIC TRITIUM. MEASUREMENT AND APPLICATION* 016975 P 9
#DETECTION AND MEASUREMENT (TRITIUM)* 077198 P 30
#DECONTAMINATION TESTS ON TRITIUM-CONTAMINATED MATERIALS* 024286 P 11
TRITIUM MONITORS* # TRITIUM-IN-AIR GENERATOR FOR DYNAMIC CALIBRATION OF 024591 P 12
#A PORTABLE TRITIUM-IN-AIR MONITOR* 008679 P 3
#CALIBRATION OF TRITIUM-IN-AIR MONITORS* 008680 P 4
#LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS* 040792 P 18
#RESEARCH ON AVALANCHE TYPE SEMICONDUCTOR RADIATION DETECTORS* 056070 P 21
MONITOR AND A TRITIUM AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-RAY DOSIMETERS* OF A SIMPLE TRITIUM 096879 P 34

DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT #A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER FOR DIFFERENTIALLY 081436 P 30
DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT #A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY 074953 P 27
DETERMINING TRITIUM OXIDE AND GAS IN AMBIENT #A RUGGEDIZED ULTRASENSITIVE FIELD AIR SAMPLER SYSTEM FOR DIFFERENTIALLY 077165 P 29
DETERMINATION OF #A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE 007852 P 2
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 14
ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE* #PROBLEMS 025597 P 12
ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES IN URINE* OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC 007852 P 2
#PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. 036537 P 16
#ANALYTICAL TECHNIQUES FOR THE USE AND CONTROL OF TRITIUM AT SAVANNAH RIVER* 043089 P 19
#LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH* 016938 P 9
REPORTS SERIES NO. 61* #LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL 017268 P 9
INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. I. 042769 P 19
#THE USE OF WATER AS A SAMPLING MEDIUM FOR TRITIUM OXIDE* 026278 P 13
#CALIBRATION OF AIRBORNE AND GASEOUS ACTIVITY MONITORS USED IN THE DR3 REACTOR BY AR-41 AND XE-133* 063405 P 23
DETERMINATION OF RADIONUCLIDES IN #A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE 007852 P 2
#THE DETECTION OF TRITIATED WATER USING A PLASTIC-SCINTILLATOR FLOW CELL* 037759 P 17
#A TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING TRITIATED MOISTURE* 061201 P 22
A SIMPLE TRITIUM MONITOR AND A TRITIUM AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-RAY DOSIMETERS* OF 096879 P 34
II. MAY - JULY 1970* #ZIRCALOY - CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY PROGRESS REPORT 061489 P 22

TRITIUM MONITOR AND A TRITIUM AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-RAY DOSIMETERS* OF A SIMPLE 096879 P 34
TO DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE TRACER* #GRAPHICAL EVALUATION OF EXPERIMENTS 074336 P 27
#DEVELOPMENT OF A MONITOR FOR TRITIATED WATER VAPOR IN THE PRESENCE OF NOBLE GASES* 082070 P 31
#DETECTION OF THE CONTAMINATION OF AIR BY TRITIATED WATER VAPOUR AROUND THE REACTOR EL 3* 030689 P 15
ENVIRONMENT* #STUDY ON THE VARIATION OF TRITIUM AND C-14 CONCENTRATIONS IN THE 038591 P 17
OF THE TOTAL TRITIUM ACTIVITY ADSORBED ON THE SURFACE OF VARIOUS METALS* #DETERMINATION 008150 P 3
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 21
DESIGNED FOR MILITARY APPLICATION* #RELIABLE AND VERSATILE INSTRUMENTATION FOR DETECTION OF TRITIUM HAZARD 023245 P 11
#BACKGROUND RATES IN TRITIUM COUNTING - THE EFFECT OF THE VIAL* 030394 P 15
FOR 1968 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION* 036537 P 16

#THE USE OF WATER AS A SAMPLING MEDIUM FOR TRITIUM OXIDE* 026278 P 13
#A METHOD FOR CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR* 011470 P 4
#A METHOD FOR CONTINUOUS MEASUREMENT OF TRITIATED WATER IN AIR* 011130 P 4
BIBLIOGRAPHIC STUDY OF #STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - 042769 P 19
BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. I. INTRODUCTION - 042769 P 19
#THE NATIONAL BUREAU OF STANDARDS TRITIATED WATER STANDARDS.* 051100 P 21
#THE DETECTION OF TRITIATED WATER USING A PLASTIC-SCINTILLATOR FLOW CELL* 037759 P 17
TO DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE TRACER* EVALUATION OF EXPERIMENTS 074336 P 27
#DEVELOPMENT OF A MONITOR FOR TRITIATED WATER VAPOR IN THE PRESENCE OF NOBLE GASES* 082070 P 31
#DETECTION OF THE CONTAMINATION OF AIR BY TRITIATED WATER VAPOUR AROUND THE REACTOR EL 3* 030689 P 15
OF ACCURACY AND PRECISION LIMITS FOR TRITIUM IN WATER* #THE DETERMINATION 066056 P 24
EXCHANGE IN AROMATIC HYDROCARBONS SATURATED WITH TRITIATED WATER* #RADIATION-INDUCED H-T 041955 P 19
MEASUREMENTS OF THE SPECIFIC RADIOACTIVITY OF TRITIATED WATER* #INTERNAL GAS COUNTING METHOD FOR ABSOLUTE 094457 P 33
ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE 042769 P 19
#FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2* 004811 P 1
#THE MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO METEOROLOGY AND HYDROLOGY. 028116 P 13
#TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES* 013806 P 8
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013347 P 5
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013795 P 8
#THE CURRENT TRITIUM CONTENTS OF NATURAL WATERS* 061936 P 23
#MEASUREMENT OF TRITIUM CONCENTRATION OF NATURAL WATERS* 082850 P 31
#A TRITIUM STACK MONITOR WITH A WIDE DIGITAL RANGE* 066861 P 25
MONITOR FOR TRITIUM IN AIR WITH HIGH SENSITIVITY AND WIDE RANGE* #CONTINUOUS 077164 P 29

AND A TRITIUM AMPOULE LEAK TESTER USING VA-J-15/15A TYPE X-RAY GAMMA-RAY DOSIMETERS* OF A SIMPLE TRITIUM MONITOR 096879 P 34
ACTIVITY MONITORS USED IN THE DR3 REACTOR BY AR-41 AND XE-133* #CALIBRATION OF AIRBORNE AND GASEOUS 063405 P 23

PROGRESS REPORT II. MAY - JULY 1970* # ZIRCALOY - CLAD UO2 FUEL ROD EVALUATION PROGRAM. QUARTERLY 061489 P 22

V Environmental Behavior

V - ENVIRONMENTAL BEHAVIOR

003488
MCMAHON JW
THE DISPERSION OF TRITIUM IN PERCH LAKE
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER
15 PAGES, 6 FIGURES, 8 REFERENCES- JANUARY 1964, AECL-1889

TRITIATED WATER FROM THE LIQUID DISPOSAL AREA ON C.R.N.L. PROPERTY IS EVENLY DISPERSED THROUGHOUT A SMALL NATURAL RESERVOIR - PERCH LAKE. THE AVERAGE TRITIUM CONCENTRATION IN THE LAKE (1.14 MU C/L), OVER AN 8 MONTH PERIOD, REPRESENTED ONLY 3.8% OF THE OCCUPATIONAL 168 HOUR (MPC) W. COMPLETE MIXING OF WATER OCCURS IN THE LAKE UNDER BOTH WINTER AND SUMMER CONDITIONS. THE PRESENCE OF A SUBTERRANEAN SPRING IN PERCH LAKE AND VARIATIONS IN TRITIUM CONCENTRATION IN PERCH LAKE SWAMP AND MARGINAL AREAS OF THE LAKE ARE DISCUSSED.

*GROUND WATER + *SURFACE WATER + *WATER

004811
FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, ROBERT A. TAFT SANITARY ENGINEERING CENTER
33 PAGES, 23 FIGURES, 7 TABLES- 1960, SEC-TR R60-2 (A/AC.82/G/L 511) (TID-12884)- OTS

THIS REPORT ON WATER-BORNE RADIONUCLIDES RECORDS PROGRESS MADE IN FIVE SPECIFIC AREAS OF STUDY DURING THE SECOND YEAR OF THE PROJECT, COVERING THE PERIOD FROM MAY 1, 1958 TO JUNE 30, 1959. THE AREAS COVERED INCLUDE INSTRUMENTATION, TRITIUM, ESTUARINE AND MARINE WATERS, AQUATIC BIOTA, AND THE FATE OF RADIOACTIVE MATERIALS IN THE WATER ENVIRONMENT. DESCRIBED ARE SOME CHANGES MADE IN EXISTING COUNTING EQUIPMENT TO IMPROVE SENSITIVITY, PROGRESS MADE TO IMPROVE TRITIUM ANALYSES, IMPROVEMENTS IN ANALYSES OF RADIONUCLIDES IN SEA WATER, METHODS USED TO IDENTIFY RADIONUCLIDES ASSOCIATED WITH ALGAE, AND THE DEVELOPMENT OF STREAM SAMPLING DEVICES. RESULTS OF ANALYSES OF SAMPLES COLLECTED AT KAPL, SAVANNAH RIVER, AND SHIPPINGPORT ARE REPORTED.

CRUSTACEAN + CESIUM + ECOLOGY + *MONITOR, LIQUID + STRONTIUM + *SURVEY, ENVIRONMENT + *SURFACE WATER, NUCLIDE OCCURRENCE + *SURFACE WATER, SUSPENDED MATERIAL + RADIATION MONITORS

004950
INOUE Y + KAUFMAN WJ
PREDICTION OF MOVEMENT OF RADIONUCLIDES IN SOLUTION THROUGH POROUS MEDIA
UNIVERSITY OF CALIFORNIA, BERKELEY
11 PAGES- HEALTH PHYSICS, 9(7)- 705-715 (JULY 1963)

THE TRANSPORT OF A CATIONIC RADIONUCLIDE THROUGH THE EARTH WAS DETERMINED. IF WATER MOVEMENT IS ASCERTAINED BY TRITIATED WATER AND THE EXCHANGE PROPERTIES ARE DETERMINED, IT IS POSSIBLE TO PREDICT THE ARRIVAL OF INDIVIDUAL RADIOISOTOPES. FOR THE PREDICTION TO BE FULLY APPLICABLE, THE FORMATION SHOULD BE REASONABLY HOMOGENEOUS, THE ISOTOPE DISTRIBUTION FACTOR SHOULD REMAIN CONSTANT, AND EXCHANGE EQUILIBRIA SHOULD PREVAIL AT ALL POINTS. IT IS ALSO DESIRABLE THAT THE HYDRAULIC FLOW NET REMAIN UNCHANGED. THE VALIDITY OF THE THEORY WAS TESTED WITH LABORATORY COLUMNS AND WITH A FIELD INVESTIGATION. THE FIELD TEST INVOLVED SEVERAL ARRAYS OF INJECTIONS AND RELIEF WELLS AND TWENTY-THREE OBSERVATION WELLS PENETRATING A CONFINED AQUIFER 100 FT BELOW THE EARTHS SURFACE. THE RESULTS DEMONSTRATED THE THEORETICAL VALIDITY AND PRACTICAL UTILITY OF THE THEORY.

EFFLUENT + GROUND WATER + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *STRONTIUM + *WASTE DISPOSAL, TERRESTRIAL

006736
HUISWAARD PJ + BANKS RB + BELL CG
DISPERSION IN TIDAL ESTUARIES
99 PAGES, 12 FIGURES, TABLES- JANUARY 1, 1959, AECU-4037- CFSTI

STUDY OF THE PROBLEM OF DIFFUSION OF POLLUTION IN A VERTICALLY AND LATERALLY MIXED TIDAL ESTUARY WAS UNDERTAKEN WITH THE PURPOSE OF INVESTIGATING SEVERAL CHARACTERISTICS OF DIFFUSION IN TIDAL ESTUARIES. A NUMBER OF EXPERIMENTS WERE CONDUCTED AT NORTHWESTERN UNIVERSITY WITH METHYLENE BLUE TRACER, TO STUDY THE INFLUENCE ON THE DIFFUSION PROCESS OF THE PERIODIC VARIATIONS OF FLOW WHICH ARE CHARACTERISTIC OF TIDAL ESTUARIES. TRANSIENT CONCENTRATION DISTRIBUTIONS DEMONSTRATED CLEARLY THE INFLUENCE OF THE PERIODIC HYDRAULIC CHANGES. A QUANTITY (K ?), CLOSELY RELATED TO THE ACTUAL DIFFUSION COEFFICIENT, WAS INTRODUCED AND APPEARED TO VARY IN MAGNITUDE AS A PERIODIC FUNCTION WITH THE SAME PERIOD AS THE TIDE. THE OSCILLATORY MOVEMENT OF POLLUTANT WAS ALSO CLOSELY STUDIED WITH AN INSTANTANEOUS INJECTION OF RADIOACTIVE TRITIUM WATER IN THE MODEL OF THE SAVANNAH HARBOR.

DIFFUSION + DILUTION + *HYDRAULIC ANALYSIS + HYDRAULIC EXPERIMENT + MONITOR, LIQUID + *RIVER + SURFACE WATER + RHODAMINE B + *SURFACE WATER, TRACER + *WASTE DISPOSAL, RIVER + SURFACE WATER, DISPOSAL MEDIA + SURFACE WATER, PROPERTY + *DISPERSION

007132
JACOBS DG + SHAIKH MU
LIQUID INJECTION INTO DEEP PERMEABLE FORMATIONS
OAK RIDGE NATIONAL LABORATORY
7 PAGES, 1 FIGURE, 1 TABLE- OCTOBER 1964, ORNL-3697, PAGES 3-10 OF HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1964- CFSTI

007132 *CONTINUED*
MOVEMENT OF RADIONUCLIDES THROUGH POROUS MEDIA IS DUE TO MOVEMENT OF THE TRANSPORTING WATER AFFECTED BY ION EXCHANGE PROPERTIES. CALCULATIONS FOR MOVEMENT OF SOLUTION AND RADIO-STRONTIUM THROUGH BEREA SANDSTONE WERE CONFIRMED BY EXPERIMENT. BEHAVIOR OF CHLORIDE AS A WATER TRACER IS COMPLICATED BY ITS REPULSION BY NEGATIVELY CHARGED SOIL COLLOIDS. THESE EFFECTS WOULD BE DECREASED AS THE CONCENTRATION OF ELECTROLYTE IS INCREASED AND WOULD PROBABLY BE RATHER INSIGNIFICANT IN CLEAN SANDSTONES. ANION EXCLUSION GIVES A GOOD MEASURE OF LATTICE EXPANSION AND COLLAPSE OF HYDROBIOTITE SYSTEMS. ACCURATE METHOD FOR MEASURING SURFACE CHARGE DENSITY OF THESE MATERIALS.

CESIUM + CHROMATOGRAPHY + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + STRONTIUM + GROUND WATER, TRACER + HYDROLOGY + ION EXCHANGE + *MINERAL EXCHANGE + SOIL PROPERTY + DISPERSION + CHLORINE

007341
BARRY PJ
SOME RECENT EXPERIMENTS ON TRANSFER OF RADIOACTIVE TRACERS FROM AIR TO NATURAL SURFACES
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
17 PAGES, TABLES- MAY 1964, AECL-2045 (CRL-86)- AECL

FIELD EXPERIMENTS TO MEASURE THE RATE OF DEPOSITION OF TRITRATED WATER VAPOUR AND RADIOIODINE VAPOUR TO NATURAL SNOW SURFACES ARE DESCRIBED. THE METEOROLOGICAL APPLICATIONS OF THE RESULTS OBTAINED IN THE FIELD OF GASEOUS EXCHANGE BETWEEN ATMOSPHERE AND THE EARTHS SURFACE SUCH AS FOR EXAMPLE IN EVAPORATION AND EVAPO-TRANSPIRATION ARE DISCUSSED. BY SIMULTANEOUSLY MEASURING THE RATES OF DEPOSITION OF TWO RADIOACTIVE TRACERS HAVING DIFFERENT MOLECULAR DIFFUSIVITIES IT HAS BEEN FOUND THAT MOLECULAR DIFFUSION PLAYS AN IMPORTANT ROLE IN ADDITION TO TURBULENT EDDY DIFFUSION, PRESUMABLY BECAUSE OF THE PRESENCE OF A LAMINAR SUBLAYER IN CLOSE PROXIMITY TO THE SURFACE. BY COMPARING THE RELATIVE TRANSFER RATES FOR THE TWO TRACERS IT IS POSSIBLE TO ESTIMATE THE THICKNESS OF THE LAMINAR SUBLAYER.

AIRBORNE RELEASE + *DEPOSITION + DIFFUSION + *ATMOSPHERIC DIFFUSION EXPERIMENT + FISSION PRODUCT, IODINE + *IODINE + TRACER, RADIOACTIVE + *FISSION PRODUCT TRANSPORT + *RADIOACTIVITY RELEASE

007456
STEAD FW
DISTRIBUTION IN GROUNDWATER OF RADIONUCLIDES FROM UNDERGROUND NUCLEAR EXPLOSIONS
U. S. GEOLOGICAL SURVEY, DENVER, COLORADO
11 PAGES, 2 TABLES, 1 FIGURE, 22 REFERENCES- TID-7695, PROCEEDINGS OF THE THIRD PLOWSHARE SYMPOSIUM, ENGINEERING WITH NUCLEAR EXPLOSIVES, APRIL 21, 22, 23, 1964, PAGES 127-138- CFSTI

RADIONUCLIDES RELEASED FROM UNDERGROUND NUCLEAR EXPLOSIONS IN THE PLOWSHARE PROGRAM WILL BE INITIALLY DISTRIBUTED IN THE MEDIUM BY DIRECT EXPLOSIVE ACTION- LONG-LIVED AND BIOLOGICALLY SIGNIFICANT RADIONUCLIDES MAY LATER ENTER INTO AND MOVE WITH GROUNDWATER FLOW. WHERE ADEQUATE PRECAUTIONS HAVE BEEN TAKEN, NO SIGNIFICANT POST-EXPLOSION MOVEMENT OF RADIONUCLIDES CAN AS YET BE DEMONSTRATED- HOWEVER, RADIOACTIVE WASTE DISPOSAL OPERATIONS CLEARLY INDICATE THAT RADIONUCLIDES CAN BE TRANSPORTED CONSIDERABLE DISTANCES BY GROUNDWATER FLOW. PREDICTION OF THE EXTENT OF RADIONUCLIDE CONTAMINATION OF GROUNDWATER IS PRECLUDED BY ENVIRONMENTAL FACTORS- EACH PROPOSED SITE OF A PLOWSHARE NUCLEAR EXPLOSIVE APPLICATION MUST BE EVALUATED, TO DETERMINE IF GEOLOGIC AND HYDROLOGIC CONDITIONS ARE PRESENT WHICH MIGHT PERMIT RELATIVELY RAPID AND PROLONGED MIGRATION OF RADIONUCLIDES.

CARBON + CESIUM + COBALT + MPC + *PLOWSHARE + RUTHENIUM + SOIL, RADIONUCLIDE MOVEMENT THROUGH + STRONTIUM + *ACTIVATION PRODUCT + GROUND WATER, NUCLIDE OCCURRENCE + *NUCLEAR DETONATION + *SOIL, NUCLIDE OCCURRENCE + *HYDROLOGY + MINERAL EXCHANGE + HYDROLOGY, RATE OF MOVEMENT

007620
CLEBSCH A + LIEBERMAN JA
THE POSSIBILITY OF GROUND WATER CONTAMINATION BY FALLOUT
U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C., + U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
11 PAGES- FEBRUARY 1962, TID-7632, BOOK 2, PAGES 306-317 OF PROCEEDINGS OF A CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, HELD IN GERMANTOWN, MARYLAND, NOVEMBER 15-17, 1961- CFSTI, $5.75

IN CONSIDERING WATER-SUPPLY PROBLEMS THAT COULD ARISE FROM CONTAMINATION OF STREAMS AND RESERVOIRS BY BOMB DEBRIS IN THE EVENT OF A NUCLEAR ATTACK, THE IDEA HAS BEEN GENERALLY ACCEPTED THAT WATER SUPPLIES DERIVED FROM GROUND-WATER SOURCES CAN BE EXPECTED TO BE FREE OF CONTAMINATION. AS WITH MOST GENERALIZATIONS, THERE ARE POSSIBLE EXCEPTIONS. IT IS THE PURPOSE OF THESE REMARKS TO DESCRIBE BRIEFLY THE KINDS OF GEOHYDROLOGIC TERRANES THAT BY REASON OF THEIR GEOLOGIC STRUCTURE AND MINERALOGIC CHARACTERISTICS PROVIDE THE HIGHEST DEGREES OF SAFETY FROM FALLOUT CONTAMINATION, AND ALSO TO INDICATE THE TYPE OF GROUND-WATER RESERVOIRS THAT ARE SUSCEPTIBLE TO CONTAMINATION AS A RESULT OF MASSIVE DEPOSITION OF BOMB DEBRIS.

*FALLOUT + GEOLOGY + SOIL, RADIONUCLIDE MOVEMENT THROUGH + *GROUND WATER, NUCLIDE OCCURRENCE + CONTAMINATION + HYDROLOGY + MINERAL EXCHANGE + HYDROLOGY, RATE OF MOVEMENT

008303
MILLER CE + HILSMEIER WF
SECOND AEC CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS
OAK RIDGE NATIONAL LABORATORY + U. S. WEATHER BUREAU, OAK RIDGE
7 PAGES, 58 REFERENCES- NUCLEAR SAFETY 6(3)- 283-291 (SPRING 1965)

008303 *CONTINUED*

THE SECOND AEC CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, SPONSORED BY THE AEC DIVISION OF BIOLOGY AND MEDICINE, WAS HELD AT AEC HEADQUARTERS, GERMANTOWN, MD., NOVEMBER 3-6, 1964. THE CONFERENCE AGENDA INCLUDED DISCUSSIONS OF THE PHYSICAL, CHEMICAL, AND RADIOLOGICAL CHARACTERISTICS OF ATMOSPHERIC RADIOACTIVITY AND FALLOUT- PARTICLE BEHAVIOR- ATMOSPHERIC TRANSPORT- AND DISTRIBUTION AND CYCLING OF RADIONUCLIDES.

CARBON + ATMOSPHERIC CIRCULATION, GLOBAL + *ATMOSPHERIC DIFFUSION, GLOBAL + *FALLOUT + *PARTICLE SIZE + *RAINOUT + SAMPLING, HIGH ALTITUDE + STRATOSPHERE + STRONTIUM + TRACER, RADIOACTIVE + INSTRUMENT, AIR SAMPLING + SAMPLING + *NUCLEAR DETONATION + RADON + OZONE

008330

MORRIS DA + TEASDALE WE

HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963

U. S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY, IDAHO FALLS, IDAHO

IDO-22046 +. 228 PAGES, FIGURES, TABLES, REFERENCES- MAY 1964- CFSTI, $6.00 CY

U. S. GEOLOGICAL SURVEY INVESTIGATIONS FOR 1963 AT THE NRTS ARE DISCUSSED AND INCLUDE REGIONAL GEOHYDROLOGY OF NRTS AND ADJACENT AREAS, SPECIAL STUDIES RELATED TO WASTE DISPOSAL, HYDROLOGY OF WASTE DISPOSAL, COLLECTION OF BASIC RECORDS AND THE FUTURE SCOPE OF THE PROGRAM.

CESIUM + GEOLOGY + GROUND WATER + *NRTS + SITING + STRONTIUM + *WASTE DISPOSAL + GROUND WATER, NUCLIDE OCCURRENCE + GROUND WATER, PROPERTY + SOIL, NUCLIDE OCCURRENCE + HYDROLOGY + GEOLOGY, GEOCHEMICAL + GEOLOGY, GEOPHYSICAL

008686

POST-SHOT HYDROLOGIC SAFETY. PROJECT SHOAL. FINAL REPORT

HAZLETON-NUCLEAR SCIENCE CORPORATION, PALO ALTO, CALIFORNIA

VUF-1014 +. 50 PAGES, 5 FIGURES, 2 TABLES, 14 REFERENCES- FEBRUARY 11, 1966- CFSTI, $3.00

AN INVESTIGATION OF GROUND-WATER CONTAMINATION RESULTING FROM THE SHOAL EVENT WHICH OCCURRED IN THE SATURATED GRANITE OF THE SAND SPRINGS RANGE, NEVADA, SHOWED THAT THE TRANSPORT OF RADIONUCLIDES BY GROUND WATER WILL BE QUITE SLOW AND RADIOACTIVE DECAY AND OTHER FACTORS WILL LOWER CONCENTRATION OF NUCLIDES TO NON-HAZARDOUS LEVELS BEFORE THE WATER TRAVELS MORE THAN 1000 METERS FROM THE DETONATION AREA.

CESIUM + GEOLOGY + STRONTIUM + ACTIVATION PRODUCT + GROUND WATER, NUCLIDE OCCURRENCE + *NUCLEAR DETONATION + HYDROLOGY + *HYDROLOGY, RATE OF MOVEMENT

009164

LYNCH EJ + DAVIS SN + POSTLE GL

TRANSPORT OF RADIONUCLIDES BY GROUND WATER- SOME THEORETICAL ASPECTS

HAZLETON-NUCLEAR SCIENCE CORPORATION, PALO ALTO, CALIFORNIA + BRADBERRY (CARROLL E.) AND ASSOCIATES, LOS ALTOS, CALIF.

HNS-1229-61 +. 56 PAGES- NOVEMBER 30, 1964- CFSTI, $3.00 CY, $0.75 MN

RADIONUCLIDES MAY BE TRANSPORTED BY FLOWING GROUNDWATER FROM THE SITE OF A NUCLEAR DETONATION TO POINTS OF POTENTIAL WATER USE. TO AID IN EVALUATING THE HAZARD FROM THIS CONDITION, AN ANALYSIS OF WATER TRANSPORT AND CONTAMINANT MOVEMENT IS MADE HEREIN. EQUATIONS ARE PRESENTED FOR PREDICTING TRANSPORT TIME AND DISPERSION IN UNIFORM SYSTEMS. THE EQUATIONS INDICATE THAT DISPERSION SHOULD HAVE A NEGLIGIBLE EFFECT ON TRANSPORT TIME, EXCEPT FOR FLOW THROUGH A SINGLE SET OF PARALLEL FRACTURES. THIS IS AT VARIANCE WITH OBSERVED CASES OF DISPERSION IN GRANULAR ROCKS, AND SUGGESTS THAT GEOLOGIC INHOMOGENEITIES MAY PLAY AN IMPORTANT ROLE. METHODS FOR DETERMINING ANISOTROPY OF AQUIFER ROCKS AND FOR MEASURING THE RETARDATION FACTOR IN PLACE NEED TO BE DEVELOPED.

ADSORPTION + GEOLOGY + *FISSION PRODUCT TRANSPORT + *GROUND WATER, NUCLIDE OCCURRENCE + GROUND WATER, PROPERTY + GROUND WATER, TRACER + *NUCLEAR DETONATION + HYDROLOGY + DISPERSION + HYDROLOGY, RATE OF MOVEMENT

011784

HASKELL EE + LEVENTHAL JS + BIANCHI WC

THE USE OF TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER TOWARD IRRIGATION WELLS IN WESTERN FRESNO COUNTY, CALIFORNIA

U. S. DEPARTMENT OF AGRICULTURE, FRESNO + UNIVERSITY OF CALIFORNIA, LOS ANGELES

11 PAGES, 5 FIGURES, 3 TABLES, 21 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH 71(16) PAGES 3849-59 (AUGUST 15, 1966)

THE TRITIUM CONTENT OF WATER FROM IRRIGATION WELLS ALONG TWO EAST-WEST TRAVERSE LINES WAS USED IN ESTIMATING GROUNDWATER VELOCITIES IN THE SAN JOAQUIN VALLEY. TRITIUM PEAKS DUE TO NUCLEAR WEAPONS TESTS WERE IDENTIFIED WITHIN THE GROUNDWATER BODY. THE ESTIMATED VELOCITIES WERE COMPARABLE WITH VELOCITIES EXPECTED IN THE COARSE PARTS OF THE AQUIFERS. THE RATIO OF TRITIUM IN THE WELL WATER TO THAT IN THE RAIN WAS INCONSISTENT WITH PREDICTED RECHARGE, INDICATING THAT RECHARGE WAS LOCALIZED AND THAT WATER FLOWED TO THE SAMPLED WELLS THROUGH THE COARSE AQUIFERS.

RAINOUT + *GROUND WATER, TRACER + NUCLEAR DETONATION + *HYDROLOGY, RATE OF MOVEMENT + GEOLOGY, GEOPHYSICAL

012287
HAWKINS DR + SCHMALZ BL
ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION
IDAHO OPERATIONS OFFICE, U.S. ATOMIC ENERGY COMMISSION, IDAHO FALLS
IDO-12043 + CONF-651108-1 +. 46 PAGES, 4 FIGURES, AUGUST 1965, PRESENTED AT SYMPOSIUM ON ISOTOPE TECHNIQUES, URBANA, ILLINOIS. CFSTI $2.00 CY, $0.50 MN

INFORMATION ON THE CONCENTRATION OF TRITIUM IN WASTE, PRECIPITATION, AND SURFACE AND GROUND WATER AT THE NATIONAL REACTOR TESTING STATION AND SURROUNDING AREAS IS PRESENTED. IT IS SHOWN THAT THE PRESENT CONCENTRATION OF TRITIUM IN THE ENVIRONMENTAL WATER IS ABOUT 100 TIMES PRE-HYDROGEN-BOMB LEVELS. NRTS OPERATIONS HAVE NOT NOTICEABLY CONTRIBUTED TO THIS CONTAMINATION EXCEPT IN THE CASE OF GROUND WATER DOWN GRADIENT FROM THE CHEMICAL PROCESSING PLANT. TRITIATED WATER EMANATING FROM THE IDAHO CHEMICAL PROCESSING PLANT HAS BEEN DETECTED DOWN THE GROUND-WATER GRADIENT OVER AN AREA OF ABOUT 75 SQUARE MILES. THE TRITIUM CONCENTRATION IN GROUND WATER DECREASES EXPONENTIALLY WITH DISTANCE FROM THE POINT OF INJECTION. AN EMPIRICAL EQUATION HAS BEEN DERIVED WHICH DESCRIBES THIS FUNCTION.

*NRTS + RAINOUT + *WASTE DISPOSAL, TERRESTRIAL + SURFACE WATER, NUCLIDE OCCURRENCE + GROUND WATER, NUCLIDE OCCURRENCE + WASTE DISPOSAL, LIQUID + HYDROLOGY + HYDROLOGY, RATE OF MOVEMENT

013251
HAINES A + MUSGRAVE R
CHEMICAL STATE OF TRITIUM IN THE ATMOSPHERE AND SOURCES OF TRITIATED METHANE
UNIVERSITY OF ARKANSAS, FAYETTEVILLE
CONF-765 +. 6 PAGES, 1 TABLE, 3 FIGURES, PAGES 144-149 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI $6.50 CY.

THE T/H RATIOS IN ATMOSPHERIC HYDROGEN AND METHANE ARE DISCUSSED IN RELATION TO SOME OF THE AVAILABLE INFORMATION ON THE AMOUNTS OF TRITIUM RELEASED BY THE NUCLEAR INDUSTRY. THE INCREASE IN THE T/H RATIO IN ATMOSPHERIC HYDROGEN PRIOR TO 1952 CAN BE ATTRIBUTED TO THIS SOURCE. FROM THE RATE OF TRITIUM RELEASE, AN ESTIMATE OF THE PRODUCTION OF TRITIATED METHANE CAN BE MADE. SUCH AN ESTIMATE GIVES REASONABLE AGREEMENT WITH THE OBSERVED T/H VALUES.

FISSION PRODUCT RELEASE

013282
THATCHER LL + PAYNE BR + CAMERON JF
TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
CONF-765 +. 29 PAGES, 13 FIGURES, 8 TABLES, 9 REFERENCES, PAGES 646-674 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI $6.50 CY.

TRITIUM LEVELS ROSE FROM AN AVERAGE BASE OF 80 TRITIUM UNITS (T.U.) FOR CONTINENTAL SITES IN THE NORTHERN HEMISPHERE TO AVERAGE PEAKS OF 2000 T.U. IN 1962 AND 4000 TO 5000 IN 1963. INDIVIDUAL PEAKS WERE HIGHER, REACHING 10,000 IN NORTHERN CANADA. LEVELS IN PRECIPITATION WERE LOWER IN 1964. THE PEAK YEAR APPEARS TO HAVE BEEN 1963. THE RATE OF DECREASE FROM 1963 TO 1964 IS LESS THAN THE COMPARABLE PERIOD 1959 TO 1961, POSSIBLY REFLECTING THE HIGHER ALTITUDES INVOLVED IN THE LAST TESTING. TRITIUM AND SR-90 DEPOSITION VALUES OVER THE GLOBE SHOW INTERESTING CONSISTENCIES THAT MAY PERMIT THE ESTIMATION OF TRITIUM CONCENTRATION FOR UNSAMPLED AREAS. THE HTO/SR-90 RATIO INCREASES TOWARD THE HIGH MID-LATITUDES IN THE NORTHERN HEMISPHERE. THE SOUTHERN-HEMISPHERE PRECIPITATION AVERAGED ONLY 15 T.U. IN 1963 COMPARED TO SEVERAL THOUSAND TRITIUM UNITS FOR THE NORTHERN HEMISPHERE. IT IS ESTIMATED THAT IN 1962 AND 1963 THE DEPOSITION OF TRITIUM HAD BEEN APPROXIMATELY 44 OR 96 KG, DEPENDING ON WHETHER OR NOT OCEANIC EXCHANGE WAS INCLUDED IN THE CALCULATION. THIS WOULD LEAVE EITHER 124 OR 72 KG IN THE STRATOSPHERE BASED ON THE ASSUMPTION OF A 168-KG PRODUCTION IN 1961 AND 1962.

*ATMOSPHERIC CIRCULATION, GLOBAL + FALLOUT + RAINOUT + STRATOSPHERE + STRONTIUM

013283
ERIKSSON E + BOLIN B
OXYGEN-18, DEUTERIUM, AND TRITIUM IN NATURAL WATERS AND THEIR RELATIONS TO THE GLOBAL CIRCULATION OF WATER
INTERNATIONAL METEOROLOGICAL INSTITUTE, STOCKHOLM
CONF-765 +. 12 PAGES, 4 FIGURES, 9 REFERENCES, PAGES 675-686 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI $6.50 CY.

THE OCCURRENCE OF THE NUCLIDES O-18, DEUTERIUM, AND TRITIUM IN NATURAL WATERS IS DISCUSSED ON THE BASIS OF THE GENERAL CIRCULATION OF WATER DERIVED FROM STANDARD METEOROLOGICAL OBSERVATIONS OF HUMIDITY, PRECIPITATION, AND EVAPORATION. IF THE ESTABLISHMENT OF A CHARACTERISTIC VERTICAL DISTRIBUTION OF MOISTURE, DEUTERIUM, AND O-18 IS RAPID (A FEW DAYS) IN COMPARISON WITH THE LARGE-SCALE HORIZONTAL TRANSFER RATES OF MOISTURE OVER THE OCEANS, ONE CAN RELATE THE VERTICAL DISTRIBUTION OF DEUTERIUM AND O-18 IN AIR MOISTURE AND THE CONTENT OF THESE NUCLIDES IN PRECIPITATION TO THE HUMIDITY DISTRIBUTION, THE ISOTOPIC COMPOSITION OF SEA WATER, AND THE CHARACTERISTIC FRACTIONATION FACTOR FOR CONDENSATION-EVAPORATION.

*ATMOSPHERIC CIRCULATION, GLOBAL + DEUTERIUM + FALLOUT + OXYGEN + *WATER

013347
BUTTLAR HV
TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE
TECHNICAL UNIVERSITY OF MUNCHEN
5 PAGES, 7 FIGURES, 12 REFERENCES, NUCLEAR INSTRUMENTS AND METHODS 37(2), PAGES 288-92, (DECEMBER 1965)

SAMPLE WATER IS CONVERTED TO HYDROGEN GAS AND THEN CONTACTED WITH ETHYLENE TO YIELD ETHANE. THE TRITIUM RADIOACTIVITY IS COUNTED IN AN DESCHGER-TYPE COUNTER IN THE LIMITED PROPORTIONAL REGION. A TRANSISTORIZED ELECTRONIC CIRCUIT ALLOWS SIMULTANEOUS REGISTRATION OF TRITIUM COUNTS PLUS BACKGROUND BELOW, AND MAINLY BACKGROUND ABOVE ABOUT 15 KEV. WITH A GEOMETRIC VOLUME OF THE CENTRAL TRITIUM COUNTER OF 2.9 LITERS, THE ANTICOINCIDENCE BACKGROUND IS 2.74 PLUS-OR-MINUS 0.03 CPM IN THE TRITIUM CHANNEL. A SAMPLE OF 100 TU HAS A SAMPLE COUNTING RATE OF 1.32 CPM WHEN THE ETHANE PRESSURE IS 750 MM HG. DETAILS ABOUT BACKGROUND TRITIUM SPECTRUM, EFFICIENCY, RELIABILITY AND LONG-TIMES STABILITY ARE GIVEN. THE TRITIUM CONCENTRATIONS OF WATER SAMPLES FROM RHINE AND MAIN RIVER TAKEN BETWEEN 1961 AND 1964 SHOW PRONOUNCED MAXIMA IN THE SUMMER, ABOUT TWO MONTHS LATER AND A FACTOR 5 SMALLER THAN THE RAIN MAXIMA. WINTER MINIMA DIFFER BY A FACTOR OF 2.

COUNTER + *SURFACE WATER, NUCLIDE OCCURRENCE + *ANALYTICAL TECHNIQUE + GERMANY

013458
SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM
SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE
CONF-640413 +. 138 PAGES, TABLES, SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM, LE VESINET, FRANCE, APRIL 16-18, 1964, IN FRENCH

THE 23 PAPERS, TOGETHER WITH THE DISCUSSIONS FOLLOWING THEIR PRESENTATION, PRESENTED AT THE SEMINAR AT LE VESINET ON PROTECTION AGAINST THE DANGERS OF TRITIUM ARE COMPILED.

AVAILABILITY - SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE, FREE.

FISSION PRODUCT RELEASE

013712
MACHTA L
WORLD WIDE RADIOACTIVE FALLOUT FROM NUCLEAR TESTS-PART 1
U.S. WEATHER BUREAU
9 PAGES, 3 FIGURES, 4 TABLES, NUCLEAR SAFETY 4(4) PAGES 103-111 (JUNE 1963)

FALLOUT FROM NUCLEAR TESTING PROGRAMS IS DISCUSSED. THE RADIOCHEMICAL, CHEMICAL, AND PHYSICAL PROPERTIES OF FALLOUT ARE REVIEWED, INCLUDING THE PROBLEM OF FRACTIONATION. THE EFFECT OF THE SURFACE, AIR, AND SUBSURFACE MONITORING OF THE DETONATION ON AMOUNT AND DISTRIBUTION OF FALLOUT IS DESCRIBED. METEOROLOGICAL CONSIDERATIONS ARE USED TO DEPICT WORLDWIDE FALLOUT PATTERNS AND WORLDWIDE INVENTORIES OF SR-90 AND C-14 ARE GIVEN.

*CARBON + *FALLOUT + PARTICLE SIZE + STRONTIUM + SURFACE WATER, NUCLIDE OCCURRENCE + AIR + NUCLEAR DETONATION + SOIL, NUCLIDE OCCURRENCE + ISOTOPIC FRACTIONATION + METEOROLOGY

013795
BUTTLAR HV + FARZINE K + WOHLFAHRT D
TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE
INSTITUT FUR TECHNISCHE KERNPHYSIK DER TECHNISCHEN HOCHSCHULE DARMSTADT
CONF-650652 + GMELIN-AED-CONF-65-158 +. 16 PAGES, 7 FIGURES, 12 REFERENCES, PAGES 471-486, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

SAMPLE WATER IS CONVERTED TO HYDROGEN GAS AND THEN REACTED WITH ETHYLEN TO YIELD ETHANE. THE TRITIUM RADIOACTIVITY IS COUNTED IN AN DESCHGER-TYPE COUNTER IN THE LIMITED PROPORTIONAL REGION. A TRANSISTORIZED ELECTRONIC CIRCUIT ALLOWS SIMULTANEOUS REGISTRATION OF TRITIUM COUNTS PLUS BACKGROUND BELOW, AND MAINLY BACKGROUND ABOVE ABOUT 15 KEV. WITH A GEOMETRIC VOLUME OF THE CENTRAL TRITIUM COUNTER OF 2.9 LITERS, THE ANTICOINCIDENCE BACKGROUND IS 2.74 PLUS OR MINUS 0.03 CPM IN THE TRITIUM CHANNEL. A SAMPLE OF 100 TU HAS A SAMPLING COUNTING RATE OF 1.32 CPM WHEN THE ETHANE PRESSURE IS 750 MM HG. DETAILS ABOUT BACKGROUND, TRITIUM SPECTRUM, EFFICIENCY, RELIABILITY, AND LONG-TIME STABILITY ARE GIVEN. THE TRITIUM CONCENTRATIONS OF WATER SAMPLES FROM RHINE AND MAIN RIVER TAKEN BETWEEN 1961 AND 1964 SHOW PRONOUNCED MAXIMA IN THE SUMMER, ABOUT TWO MONTHS LATER AND A FACTOR 5 SMALLER THAN THE RAIN MAXIMA. WINTER MINIMA DIFFER BY A FACTOR OF 2.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

COUNTER + *SURFACE WATER, NUCLIDE OCCURRENCE + ANALYTICAL TECHNIQUE + GERMANY

013797
FERGUSSON GJ
RADIOCARBON AND TRITIUM IN THE UPPER TROPOSPHERE
WM. H. JOHNSTON LAB., INC., BALTIMORE
CONF-650652 + GMELIN-AED-CONF-65-158 +. 16 PAGES, 4 FIGURES, 2 TABLES, 7 REFERENCES, PAGES 525-540, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

013797 *CONTINUED*

A NUMBER OF MEASUREMENTS HAVE BEEN MADE OF C-14 CONCENTRATION IN THE UPPER TROPOSPHERE BY COLLECTION OF CARBON DIOXIDE WITH MOLECULAR SIEVE SAMPLERS. SAMPLES HAVE BEEN COLLECTED FROM 15 DEGREES N TO 48 N AND FROM 30,000 TO 43,000 FEET ALTITUDE. THESE MEASUREMENTS HAVE SHOWN C-14 ACTIVITIES UP TO TEN TIMES THE PRE-BOMB GROUND LEVEL ACTIVITY. THE OBSERVED ACTIVITY DECREASES RAPIDLY WITH DECREASING LATITUDE AND ALTITUDE. STRONG STRATIFICATION HAS BEEN EVIDENT IN SOME SETS OF MEASUREMENTS. A SERIES OF MEASUREMENTS DURING SPRING 1963, WHEN C-14 LEVELS IN THE UPPER TROPOSPHERE WERE HIGH, YIELDED A T/C-14 RATIO OF 0.48 PLUS OR MINUS 0.12. THIS RESULT IS IN CLOSE AGREEMENT WITH THE STRATOSPHERIC DATA OF HAGEMANN FOR THE 1957-58 PERIOD, AND IMPLIES THAT THE CHANGING RATIO OF FUSION TO FISSION DEVICES HAS NOT BEEN ACCOMPANIED BY A SIGNIFICANT CHANGE IN THE RATIO OF T TO C-14 PRODUCTION. THE ANNUAL ADDITION OF C-14 TO THE TROPOSPHERE IS EASILY COMPUTED FROM GROUND LEVEL C-14 MEASUREMENTS. THUS FROM THE T/C-14 RATIO OF MATERIAL ENTERING THE TROPOSPHERE THE ANNUAL INPUT OF TRITIUM CAN BE COMPUTED MORE PRECISELY THAN FROM SURFACE TRITIUM MEASUREMENTS, AND SO CAN AID UNDERSTANDING OF THE TRITIUM CYCLE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

CARBON + *SAMPLING + *TROPOSPHERE

013798
LAL D + RAMA
ATMOSPHERIC PATHWAYS OF MAN-MADE C-14, H-3, AND SR-90
CONF-650652 + GMELIN-AED-CONF-65-158 +. 8 PAGES, 5 FIGURES, 10 REFERENCES, PAGES 541-548, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, JUNE 7-11, 1965, PULLMAN, WASHINGTON

THE SALIENT FEATURES OF H-3 AND SR-90 DEPOSITION AND THE C-14 ACTIVITIES IN THE TROPOSPHERE ARE SUMMARIZED BELOW. (1) THE TRITIUM FALLOUT IN THE YEAR 1963 REVEALS A SHARP DISCONTINUITY AT ABOUT 30 DEGREES LATITUDE IN THE NORTHERN HEMISPHERE. A SIMILAR DISCONTINUITY IS SEEN IN THE CASE OF SR-90. (2) THE TROPOSPHERE EXCESS C-14 CONCENTRATIONS ROSE TO VALUES OF UP TO 105% DURING AUGUST 1963 FROM INITIAL VALUES OF ABOUT 40% DURING JANUARY 1963. (3) NORTH OF 42 DEGREES N, THE INCREASES OF C-14 CONCENTRATIONS IN THE TROPOSPHERE, REACHING PEAK VALUES AROUND JULY IN 1963 AND 1964, WERE THE SAME UP TO 78 DEGREES LATITUDE (WITHING 1-2%). THIS COULD BE EXPLAINED ONLY IF THERE IS A RAPID MIXING OF C-14. THESE OBSERVATIONS ON H-3 AND C-14 CLEARLY SHOW THAT THE REGIONS NORTH OR SOUTH OF 30 DEGREES IN THE NORTHERN HEMISPHERE CAN BE INDIVIDUALLY CONSIDERED SUFFICIENTLY WELL MIXED ON TIME SCALES OF ONE MONTH OR LESS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

CARBON + *ATMOSPHERIC CIRCULATION, GLOBAL + FALLOUT + STRONTIUM

013800
OSTLUND HG
1964 HURRICANE TRITIUM
UNIVERSITY OF MIAMI
CONF-650652 + GMELIN-AED-CONF-65-158 +. 5 PAGES, 1 FIGURES, 1 TABLE, PAGES 560-564, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

DURING THE 1964 HURRICANE SEASON VERY PRELIMINARY ATTEMPTS WERE MADE TO COLLECT WATER FROM A FEW STORMS FOR TRITIUM ANALYSIS. THE RESULTS ARE DESCRIBED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT OF COMMERCE, SPRINGFIELD, VA., $8.00 CY.

*PRECIPITATION + METEOROLOGY

013801
HOUTERMANS J
TRITIUM IN THE SURFACE WATER OF THE NORTH PACIFIC OCEAN
UNIVERSITY OF CALIFORNIA
CONF-650652 + GMELIN-AED-CONF-65-158 +. 12 PAGES, 11 FIGURES, 9 REFERENCES, PAGES 565-576, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

THE SPECIFIC ACTIVITY OF TRITIUM IN SURFACE WATER SAMPLES FROM THE NORTH PACIFIC OCEAN HAS BEEN MEASURED SINCE 1959 IN THE LA JOLLA TRITIUM LABORATORY. ONE OF THE PURPOSES HAS BEEN THE TRACING OF OCEAN WATER MOVEMENTS, PARTICULARLY THE DOWNWARD MIXING OF SURFACE WATER. THIS PAPER DESCRIBES THE PRESENT STATUS OF THE WORK AS REGARDS THIS PARTICULAR EFFORT. HYDROGEN BOMB TESTING HAS RAISED THE ACTIVITY OF THE SURFACE OCEAN WATER FROM PRE-BOMB VALUES ON THE ORDER OF ONE TRITIUM UNIT (T.U.) TO VALUES ON THE ORDER OF TEN TO TWENTY TRITIUM UNITS (1 T.U. EQUAL 1 T ATOM PER 10(18TH) H ATOMS). THESE HIGHER LEVELS OF ACTIVITY AND THE PULSE NATURE OF THE INPUT PROVIDE A GOOD OPPORTUNITY FOR SUCH TRACING OF OCEAN WATER MOVEMENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

DILUTION + *OCEAN AND SEA + *SURFACE WATER, NUCLIDE OCCURRENCE + DISPERSION

013802
ZIMMERMANN U + MUNNICH KO + ROETHER W + KREUTZ W + SCHUBACH K + SIEGEL O
DOWNWARD MOVEMENT OF SOIL MOISTURE TRACED BY MEANS OF HYDROGEN ISOTOPES
CONF-650652 + GMELIN-AED-CONF-65-158 +. 12 PAGES, 6 FIGURES, 7 REFERENCES, PAGES 577-588, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

AN INVESTIGATION OF NATURAL DEUTERIUM AND BOMB-TRITIUM IN GROUNDWATER, IN LYSIMETER SEEPAGE WATER AND IN SOIL MOISTURE (1-7) HAS SUGGESTED THAT IN SUBSTANCE THE WATER TRANSPORT IN THE SOIL IS A VERY SLOW PROCESS, AND THAT IT MAY TAKE YEARS UNTIL THE WATER TABLE IS REACHED. THE SEEPAGE WATER, WHICH EVENTUALLY SHOWS UP AT A DEPTH OF 2 OR 3 METERS AFTER A PERIOD OF HOURS OR DAYS AFTER A HEAVY RAINFALL IS ACTUALLY OLD CAPILLARY WATER FROM THE IMMEDIATE SOIL LAYER ABOVE. IN SUBSTANCE THE DOWNWARD MOVEMENT OF THE SOIL WATER DEPENDS MERELY ON THE FIELD CAPACITY OF THE SOIL. IN REALITY, OF COURSE, THE BOUNDARY DOES NOT REMAIN EXACT, RATHER IT IS BLURRED BY SEVERAL DIFFUSION-LIKE PROCESSES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

DILUTION + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *HYDROLOGY + *DISPERSION + *HYDROLOGY, RATE OF MOVEMENT

013803
THATCHER LL + PAYNE BR
THE DISTRIBUTION OF TRITIUM IN PRECIPITATION OVER CONTINENTS AND ITS SIGNIFICANCE TO GROUND-WATER DATING
CONF-650652 + GMELIN-AED-CONF-65-158 +. 26 PAGES, 9 FIGURES, 2 TABLES, PAGES 604-629, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

GROUND WATER MAY BE DATED BY DETERMINING THE DECAY OF TRITIUM THAT HAS OCCURRED IN A SAMPLE OF GROUND WATER (NATURAL TRITIUM) OR BY FOLLOWING THE PROGRESS DOWN GRADIENT OF TRITIUM PULSES INJECTED INTO THE GROUND WATER SYSTEM BY FALLOUT IN RECHARGE WATER. IN EITHER TECHNIQUE THE FUNDAMENTAL COMPONENT OF INFORMATION REQUIRED IS THE RECORD OF TRITIUM RECHARGE INTO THE GROUND WATER SYSTEM. PROGRAMS TO SPECIFICALLY MONITOR THE TRITIUM INPUT INTO THE RECHARGE AREAS OF MAJOR GROUND WATER AQUIFERS ARE ESSENTIALLY NON-EXISTENT. THEREFORE, THE HYDROLOGIST UNDERTAKING SUCH INVESTIGATIONS MUST USUALLY OBTAIN THE TRITIUM FALLOUT INFORMATION BY INTERPOLATION FROM THE TRITIUM FALLOUT OBSERVATIONS OF THE IAEA-WHO WORLD NETWORK. THE NETWORK CONSISTS OF 109 STATIONS AND THE RECORD GOES BACK TO 1961 FOR THE KEY STATIONS. TRITIUM FALLOUT DATA FOR THE PERIOD 1954-1961 FOR A PARTICULAR STATION IN THE NETWORK MAY BE RECONSTRUCTED BY COMPARISON OF THE TRITIUM RESPONSE FOR THE KNOW PERIOD AT THE STATION AGAINST THE CONTINUOUS RECORDS FOR OTTAWA (1) AND CHICAGO (2), (3). A MORE LIMITED RECORD IS ALSO AVAILABLE FOR PALISADES, NEW YORK.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

FALLOUT + RAINOUT + *HYDROLOGY + PRECIPITATION

013804
GAT JR
THE DETERMINATION OF CHARACTERISTICS OF WATER BODIES WITH THE AID OF BOMB PRODUCED TRITIUM PULSES
UNIVERSITY OF CALIFORNIA
CONF-650652 + GMELIN-AED-CONF-65-158 +. 13 PAGES, 3 FIGURES, 20 REFERENCES, PAGES 630-642, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

DURING THE PRE-BOMB COSMIC RAY ERA, TRITIUM COULD HAVE BEEN USED IN HYDROLOGY IN A STRAIGHTFORWARD THOUGH LIMITED FASHION. ONE WOULD HAVE RELATED THE TRITIUM CONCENTRATION IN ANY WATER BODY TO THE CONSTANT ATMOSPHERIC TRITIUM CONCENTRATIONS BY MEANS OF ITS RADIOACTIVE DECAY RATE. FOR A CLOSED TRAPPED WATER SYSTEM OR WHEN WATERS MOVE IN A PISTON-LIKE FASHION, WITHOUT ANY MIXING WITH ADJACENT WATER BODIES, THE RESULTANT AGE CAN BE SIMPLY INTERPRETED AS THE TIME WHICH HAS PASSED SINCE THE LAST EXPOSURE OF THESE WATERS TO THE ATMOSPHERE. IN ALL OTHER CASES A MEAN AGE IS OBTAINED, WHICH ASSUMES PHYSICAL SIGNIFICANCE ONLY INSOFAR AS THE MIXING PATTERN IN THE RESERVOIR IS EITHER KNOWN OR ESTIMATED. THIS PROBLEM HAS RECENTLY BEEN DISCUSSED BY NIR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

*DISPERSION + *HYDROLOGY, RATE OF MOVEMENT

013805
STEWART GL
EXPERIENCES USING TRITIUM IN SCIENTIFIC HYDROLOGY
U.S. GEOLOGICAL SURVEY
CONF-650652 + GMELIN-AED-CONF-65-158 +. 16 PAGES, 5 FIGURES, 1 TABLE, 8 REFERENCES, PAGES 643-658, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

NATURAL AND BOMB PRODUCED TRITIUM PROVIDES THE HYDROLOGIST WITH A VALUABLE TOOL FOR TRACING WATER THROUGH THE HYDROLOGIC CYCLE. THE U.S. GEOLOGICAL SURVEY MONITORS TRITIUM IN PRECIPITATION AND IN SURFACE WATERS AT SEVERAL LOCATIONS WITHIN THE UNITED STATES AND PUERTO RICO. GEOGRAPHICAL AND SEASONAL VARIATIONS OF TRITIUM CONCENTRATIONS FOR THESE WATERS DURING 1963 AND 1964 ARE PRESENTED. TRITIUM CONCENTRATIONS IN PRECIPITATION AND SURFACE WATERS DURING 1963 WERE, IN MOST CASES, 3 OR MORE TIMES GREATER THAN IN 1962. CONCENTRATIONS FOR 1964 WERE IN GENERAL, SLIGHTLY LOWER THAN IN 1963. THESE DATA ARE USED TO CORRELATE TRITIUM ACTIVITY WITH HYDROLOGIC CHARACTERISTICS USED IN HYDROLOGIC RESEARCH. INVESTIGATIONS ARE BEING CONDUCTED TO DETERMINE THE POTENTIAL CAPABILITIES OF TRITIUM TRACER AND AGE DATING TECHNIQUES. TRITIUM FRACTIONATION OCCURS

013805 *CONTINUED*
DURING THE DIFFUSION OF WATER THROUGH CLAYS. LABORATORY RESULTS INDICATE THAT TRITIUM IS EXCHANGED WITH HYDROGEN IN THE CLAY MINERAL STRUCTURE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

TRACER, RADIOACTIVE + *SURFACE WATER, NUCLIDE OCCURRENCE + *HYDROLOGY + MINERAL EXCHANGE + UNITED STATES

013818
BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1965
ARGONNE NATIONAL LABORATORY
ANL-7136 +. 342 PAGES, FIGURES, TABLES, REFERENCES, DECEMBER 1965

PROGRESS IS REPORTED FOR THE YEAR 1965 FOR RESEARCH IN THE AREA OF RADIATION BIOLOGY. A LIST OF PUBLICATIONS BY MEMBERS OF THE RESEARCH STAFF OF THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION IS GIVEN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $7.00 CY, $1.75 MN

CRUSTACEAN + CESIUM + ECOLOGY + DOSIMETRY + RADIATION DAMAGE + RADIATION SAFETY AND CONTROL + X-RAY + GAMMA + NEUTRON + SPECTROMETRY, GAMMA + RADIATION PROTECTION, CHEMICAL + *RADIATION EFFECT

015304
SHAIKH MU + JACOBS DG + PARKER FL
STUDY OF THE MOVEMENT OF RADIONUCLIDES THROUGH SATURATED POROUS MEDIA
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENN.
ORNL-TM-1681 +. 115 PAGES, 17 FIGURES, 5 TABLES, 56 REFERENCES, JANUARY 1967

AN EQUATION FOR THE VELOCITIES IN THE BLOCK HAS ALSO BEEN DEVELOPED. EQUIPOTENTIAL CONTOURS, STREAMLINES, AND THE FLOW HISTORY OF THE SYSTEM WERE PLOTTED BY COMPUTER. FROM THE SORPTION DATA OBTAINED FROM LINEAR FLOW CORES, THE TIME REQUIRED FOR THE BREAKTHROUGH OF SR-89 AND CA-45 WAS 8.5 AND 6.2 TIMES THAT OF WATER, RESPECTIVELY. USING DIFFERENT LINEAR FLOW RATES, COEFFICIENTS OF DISPERSION WERE OBTAINED USING CORES OF SANDSTONE. BY COMBINING THE SOLUTION OF THE VELOCITY DISTRIBUTION ATTRIBUTED TO GEOMETRY WITH SOLUTION DISPERSION AT VARIOUS RATES OF LINEAR FLOW, NET SOLUTION BREAK-THROUGH CURVES WERE CONSTRUCTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

CALCIUM + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + STRONTIUM + GROUND WATER, TRACER + ION EXCHANGE + MINERAL EXCHANGE + DISPERSION + *HYDROLOGY, RATE OF MOVEMENT + MATHEMATICAL STUDY

016975
FREJAVILLE G
ATMOSPHERIC TRITIUM. MEASUREMENT AND APPLICATION
CENTRE D ETUDES NUCLEAIRES DE SACLAY, FRANCE
CEA-BIB-76 +. 26 PAGES, FIGURES, TABLES, FEB. 1967 (IN FRENCH)

THE POSSIBLE ORIGINS OF ATMOSPHERIC TRITIUM ARE REVIEWED AND DISCUSSED. DESCRIBES ENRICHMENT (ELECTROLYSIS AND THERMAL DIFFUSION) AND COUNTING (GAS COUNTERS AND LIQUID SCINTILLATION COUNTERS) PROCESSES WHICH CAN BE USED FOR DETERMINING ATMOSPHERIC TRITIUM CONCENTRATIONS. EXAMPLES ILLUSTRATES THE USE OF ATMOSPHERIC TRITIUM FOR RESOLVING A CERTAIN NUMBER OF HYDROLOGICAL AND GLACIOLOGICAL PROBLEMS.

AVAILABILITY - SERVICE DE DOCUMENTATION DU C.E.A., CENTRE D ETUDES NUCLEAIRES DE SACLAY, B.P. NO. 2, GIF-SUR-YVETTE, FRANCE

COUNTER + *ANALYTICAL TECHNIQUE + HYDROLOGY + METEOROLOGY + RADIATION MONITORS

017268
LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS SERIES NO. 61
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA
STI-DOC-10/61 +. 144 PAGES, 29 FIGURES, 9 TABLES, AUGUST, 1966

GENERAL AND BASIC INFORMATION ENCOMPASSING THE PROPERTIES OF RADIOISOTOPES AND RADIATIONS, THE METHODS OF RADIATION DETECTION, THE APPLICATION AND USES OF THE BASIC PROPERTIES OF RADIOISOTOPES AND RADIATIONS, AND THE PRECAUTIONS AND PROCEDURES NECESSARY FOR THE SAFETY OF THE INDIVIDUAL IN THEIR USE ARE PRESENTED IN LECTURE FORM.

AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY, NEW YORK OR GENEVA, $3.50

CRUSTACEAN + *ECOLOGY + COUNTER + DOSE + TRACER, RADIOACTIVE + TRACER, GAS + ANALYTICAL TECHNIQUE + *RADIATION SAFETY AND CONTROL + RADIOISOTOPE + RADIATION EFFECT

017272
BARRACLOUGH JT + TEASDALE WE + JENSEN RG
HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION AREA, IDAHO. ANNUAL PROGRESS REPORT, 1965
GEOLOGICAL SURVEY, IDAHO FALLS, IDAHO
IDO-22048 +. 118 PAGES, FIGURES, FEBRUARY, 1967

THIS ANNUAL REPORT DESCRIBES A STUDY BY THE U.S. GEOLOGICAL SURVEY, SPONSORED BY THE USAEC, TO DETERMINE THE EFFECTS OF RADIOACTIVE WASTE DISPOSAL TO THE BASALTS OF THE SNAKE PLAIN AQUIFER. GROUND- AND SURFACE-WATER SAMPLES WERE COLLECTED FOR CHEMICAL AND RADIOMETRIC ANALYSES. THE RESULTS WERE EVALUATED AND MAPPED. GROUNDWATER LEVELS WERE ALSO MONITORED AND MAPPED. PUMPAGE AND WASTE-DISPOSAL DATA ARE GIVEN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

*GEOLOGY + NRTS + STRONTIUM + GROUND WATER, NUCLIDE OCCURRENCE + GROUND WATER, PROPERTY + *WASTE DISPOSAL, LIQUID + *HYDROLOGY + SURFACE WATER, PROPERTY + HYDROLOGY, RATE OF MOVEMENT + WATER QUALITY + GEOLOGY, GEOCHEMICAL + GEOLOGY, GEOPHYSICAL

017816
STUDY OF RAINOUT OF RADIOACTIVITY IN ILLINOIS
ILLINOIS STATE WATER SURVEY
COO-1199-10 +. 44 PAGES, FIGURES, REFERENCES, DECEMBER 1966

DURING THE SUMMER OF 1965, NETWORK WATER SAMPLING FOR RADIOACTIVITY WAS CONTINUED. ALSO, SURFACE-AIR SAMPLING PLUS AIRBORNE WATER AND AIR SAMPLING WERE CARRIED OUT. AN AIRBORNE SAMPLING SYSTEM TO SECURE ATMOSPHERIC WATER VAPOR FOR TRITIUM ANALYSIS WAS DEVELOPED AND USED. DATA INDICATED THAT PRECIPITATION IS VERY EFFECTIVE IN SCRUBBING THE ATMOSPHERE UNDER SOURCE CONDITIONS BUT MAY BE LESS SO IN OTHERS. TRITIUM DATA WERE NOT YET AVAILABLE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

FALLOUT + *RAINOUT + ATMOSPHERIC POLLUTION + SAMPLING + AIRCRAFT + METEOROLOGY + WATER VAPOR

019263
JONES PM + HUTCHESON CG
ADSORPTION OF THREE HYDROGEN ISOTOPES ON CHARCOAL
ATOMIC WEAPONS RESEARCH ESTABLISHMENT, ALDERMASTON, ENGLAND
2 PAGES, 1 FIGURE, 1 TABLE, 2 REFERENCES, NATURE 213, PAGE 490 AND 491, (FEBRUARY 4, 1967)

PREVIOUS STUDIES WITH HYDROGEN AND DEUTERIUM WERE EXTENDED TO TRITIUM. APPARATUS AND EXPERIMENTAL DETAILS ARE OUTLINED. PLOTS OF EQUILIBRIUM PRESSURES AGAINST VOLUMES OF ADSORBED GAS AT LIQUID NITROGEN TEMPERATURE WERE GOOD STRAIGHT LINES FOR ALL THREE ISOTOPES AT PRESSURES GREATER THAN 100 MM, INDICATING THAT THE ADSORPTION FOLLOWS THE LANGMUIR ISOTHERM.

DEUTERIUM + HYDROGEN + UNITED KINGDOM + *CHARCOAL ADSORBER

020442
ATHAVALE RN + LAL D + RAMA
MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90
TATA INST. OF FUNDAMENTAL RESEARCH, BOMBAY
31 PAGES, 10 FIGURES, 6 TABLES, 17 REFERENCES, PROC. INDIAN ACAD. SCI., SECT A65, PAGE 73-103, (FEBRUARY 1967)

THE CONCENTRATIONS OF TRITIUM WERE DETERMINED IN WET PRECIPITATIONS OCCURRING OVER THE INDIAN SUBCONTINENT DURING 1961 TO 1964. THE TRITIUM CONCENTRATIONS VARIED SIGNIFICANTLY DURING THE PERIOD OF OBSERVATION. HIGHEST CONCENTRATIONS WERE OBSERVED DURING 1963. THE TRITIUM AND STRONTIUM DATA FOR THE INLAND, COASTAL, AND ISLAND STATIONS WERE ANALYZED TO EVALUATE THE IMPORTANCE OF REEVAPORATION OF TRITIUM FROM CONTINENTS AND THE MOLECULAR EXCHANGE OF ATMOSPHERIC TRITIUM WITH OCEANIC WATER.

*FALLOUT + RAINOUT + STRONTIUM + INDIA + PRECIPITATION

021312
COUM HT
HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM METABOLISM
PUERTO RICO NUCLEAR CENTER, MAYAGUEZ
BMI-171-002 +. 36 PAGES, TABLES, REFERENCES, JUNE 1, 1967

FROM DATA ON RAINFALL, THROUGHFALL, STEAMFLOW, EVAPORATION, TRANSPIRATION, PERCOLATION, PHOTOSYNTHESIS, AND RESPIRATION FROM THE MONTANE FOREST AT EL VERDE, PUERTO RICO, A HYDROGEN COMPARTMENTAL DIAGRAM WITH FLOW RATES AND COMPARTMENTAL STORAGES WAS PREPARED. THE DIAGRAM PERMITS COMPUTATION OF TRANSIENT PHENOMENA FOR THE FLOW OF TRITIUM IN A TROPICAL FOREST, ASSUMING A KNOWLEDGE OF THE EXTENT AND THE DURATION OF THE TRACER INPUT. A MATHEMATICAL MODEL FOR TRITIUM TRANSFER, BASED UPON THIS DIAGRAM, IS GIVEN IN THE APPENDIX. THE STORY AT EL VERDE IS FOUND TO

021712 *CONTINUED*
BE SOMEWHAT COMPARABLE TO THAT OF PANAMA DURING ITS WET SEASON BECAUSE THEIR RAINFALL AND SATURATION DEFICITS ARE SIMILAR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

ECOLOGY + *PLOWSHARE + *EXCAVATION, NUCLEAR

021824
BROWN DJ
MIGRATION CHARACTERISTICS OF RADIONUCLIDES THROUGH SEDIMENTS UNDERLYING THE HANFORD RESERVATION
ISOCHEM INC., RICHLAND, WASHINGTON
ISO-SA-32 + CONF-670512-2 +. 16 PAGES, 1966, FROM JOINT IAEA/ENEA SYMPOSIUM ON THE DISPOSAL OF RADIOACTIVE WASTES INTO THE GROUND, VIENNA, AUSTRIA

A FIELD STUDY OF A LARGE-SCALE WASTE-DISPOSAL SITE AT HANFORD, NO LONGER USED, SHOWED THAT NEARLY ALL THE LONG-LIVED RADIONUCLIDES, SORBED ON THE SEDIMENTS IN THE VADOSE ZONE ARE RETAINED HIGH UP IN THE SEDIMENT COLUMN AND ARE RELATIVELY IMMOBILE. THAT SMALL FRACTION WHICH DOES MOVE IS SORBED ON THE UNDERLYING SEDIMENTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA $3.00 COPY, $0.65 MICROFICHE

*GEOLOGY + RUTHENIUM + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + STRONTIUM + *WASTE DISPOSAL + WASTE DISPOSAL, TERRESTRIAL + GROUND WATER, NUCLIDE OCCURRENCE + WASTE DISPOSAL, LIQUID + MINERAL EXCHANGE + SORPTION + GEOLOGY, STRATIGRAPHY + HANFORD SITE + TECHNETIUM + ISOCHEM, INC.

022972
SOMAN SD + ABRAHAM P
ESTIMATION OF DILUTION RATE FACTORS FOR TRITIATED WATER VAPOUR FROM A REACTOR STACK
BHABHA ATOMIC RESEARCH CENTRE, BOMBAY, INDIA
5 PAGES, 1 FIGURE, 2 TABLES, 12 REFERENCES, HEALTH PHYSICS PERGAMON PRESS 1967, VOL. 13, PAGES 1117-1121

TRITIUM IS PRESENT IN THE EFFLUENT AIR FROM NUCLEAR REACTORS, USING HEAVY WATER AS MODERATOR OR AS COOLANT OR BOTH, AS TRITIATED WATER VAPOUR. AS TRITIUM IS LONG-LIVED, THE ESTIMATION OF TRITIUM IN AIR AT DIFFERENT LOCATIONS CAN PROVIDE A GOOD INDICATION OF THE DILUTION OBTAINED AT THESE POINTS IF THE CONCENTRATION OF TRITIUM IN THE EXHAUST GASES IS ALSO MEASURED SIMULTANEOUSLY. COLD-FINGER SAMPLES FROM THE CIRUS EXHAUST SYSTEM HAVE BEEN ANALYSED FOR TRITIUM CONTENT TO ESTIMATE THE RATE OF RELEASE OF TRITIUM. THE METHODS ADOPTED FOR THE COLLECTION OF SAMPLES AT DIFFERENT LOCATIONS IN THE CENTRE, ESTIMATION OF TRITIUM CONCENTRATIONS, AND THE RESULTS OBTAINED ARE PRESENTED. A PORTABLE SAMPLER DEVELOPED AT TROMBAY HAS BEEN USED FOR THE COLLECTION OF MOISTURE SAMPLES FROM DIFFERENT LOCATIONS.

DILUTION + EFFLUENT + SUTTON DIFFUSION FORMULA + WASTE DISPOSAL, ATMOSPHERIC + *CONCENTRATION, GROUND LEVEL + INDIA + *SOURCE, ELEVATED + *EXPERIMENT + WATER VAPOR

023154
KORANDA JJ
RESIDUAL TRITIUM AT SEDAN CRATER
CALIFORNIA UNIV., LIVERMORE. LAWRENCE RADIATION LAB.
UCRL-70292 + CONF-670503-9 +. 36 PAGES, APRIL 2, 1967, PRESENTED AT 2ND NATIONAL SYMPOSIUM ON RADIOECOLOGY, ANN ARBOR, MICHIGAN

RESIDUAL TRITIUM FROM THE SEDAN THERMONUCLEAR DETONATION, 6 JULY 1962, WAS SCAVENGED BY OR ENTRAINED IN THE 5-6 MILLION TONS OF EARTH MATERIALS MOVED BY THE DETONATION. AS A RESULT, THE SEDAN POST-SHOT ENVIRONMENT CONTAINED A MOST SIGNIFICANT BIOLOGICAL TRACER IN THE FORM OF THO. RESIDUAL TRITIUM (THO) IS FOUND IN MICROCURIE CONCENTRATIONS IN THE INTERSTITIAL WATER OF THE SEDAN THROWOUT SOIL, AND IN THE LOOSE TISSUE WATER OF PLANTS WHICH HAVE RE-INVADED THE NEW SUBSTRATUM DEPOSITED ON THE LANDSCAPE ADJACENT TO THE CRATER. TRITIUM IS PRESENT NOT ONLY IN THE LOOSE TISSUE WATER OF VASCULAR PLANTS GROWING ON THE SEDAN THROWOUT, BUT A COMPARABLE LEVEL IS ALSO FOUND IN THE TISSUE-BOUND HYDROGEN OF THESE PLANTS. HERBIVORES, MAINLY HETEROMYID RODENTS, WHICH HAVE RE-INVADED THE SEDAN POST-SHOT ENVIRONMENT AND RESIDE THERE, ALSO HAVE TRITIUM CONCENTRATIONS IN THEIR BODY WATER BETWEEN 1 AND 3 MICROCURIE/ML. THESE BODY-WATER TRITIUM CONCENTRATIONS ARE CLOSELY RELATED TO THE LEVELS OF TRITIUM IN THE PLANT TISSUE-BOUND HYDROGEN. THE INTERNAL DOSE TO THE RESIDENT MAMMAL AT SEDAN CRATER FROM RESIDUAL TRITIUM IS ESTIMATED TO BE BETWEEN 18 AND 268 RAD, OR ABOUT 10 TIMES THAT FROM EXTERNAL RADIATION SOURCES RESULTING FROM THE DETONATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

CRUSTACEAN + BIOMEDICAL + *ECOLOGY + HYDROGEN + *DIETARY HABIT + *NUCLEAR DETONATION

023297
BARRACLOUGH JT + TEASDALE WE + ROBERTSON JB + JENSEN RG
HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966
GEOLOGICAL SURVEY, IDAHO FALLS, IDAHO
IDO-22049 +. 95 PAGES, FIGURES, TABLES, REFERENCES, OCTOBER 1967

023297 *CONTINUED*

THIS ANNUAL REPORT DESCRIBES STUDIES BY THE U.S. GEOLOGICAL SURVEY, SPONSORED BY THE USAEC, TO DETERMINE THE HYDROLOGIC EFFECTS OF DISPOSAL OF RADIOACTIVE WASTE TO THE GROUND AT THE NATIONAL REACTOR TESTING STATION. THE PROJECT HAS INVOLVED THE COLLECTION AND ANALYSES OF GROUND- AND SURFACE-WATER SAMPLES FOR RADIOMETRIC AND CHEMICAL CHANGES. RESULTS HAVE BEEN EVALUATED AND MAPPED. GROUND-WATER LEVELS HAVE ALSO BEEN MAPPED OVER THE STATION. THE NET GROUND-WATER CONSUMPTION AFTER PUMPAGE WAS WASTE INJECTION HAS BEEN DETERMINED. TWO BILLION GALLONS OF WATER WERE PUMPED DURING 1966, OF WHICH 40% WAS METERED AND RETURNED TO THE SNAKE PLAIN AQUIFER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA $3.00 COPY, $0.65 MICROFICHE

CESIUM + GEOLOGY + IODINE + NIOBIUM + NRTS + STRONTIUM + WASTE DISPOSAL + WATER + ZIRCONIUM + HYDROLOGY

023879
HUFF FA + BRADLEY WE + FETERIS PJ
STUDY OF RAINOUT OF RADIOACTIVITY IN ILLINOIS. SIXTH PROGRESS REPORT
ILLINOIS STATE WATER SURVEY, URBANA
COO-1199-14 +. 19 PAGES, FIGURES, TABLES, REFERENCES, NOVEMBER 1967

RESEARCH DURING 1967 CONCENTRATED ON FOUR STUDIES. INVESTIGATION OF THE RELATION BETWEEN THE CONCENTRATION AND DEPOSITION OF RADIOACTIVITY IN RAIN WATER AND AIR CONCENTRATIONS OF RADIOACTIVITY AIRCRAFT SAMPLING OF THE VERTICAL DISTRIBUTION OF TRITIUM EXPANDED TO INCLUDE SPATIAL SAMPLING AND MEASUREMENT OF RADON CONCENTRATIONS. CASE STUDIES INVOLVING ANALYSES OF AIR TRAJECTORIES AT LEVELS BETWEEN THE SURFACE AND 200 MB. A STUDY TO DETERMINE THE RELATIONSHIP BETWEEN THE TIME DISTRIBUTIONS OF RADIOACTIVITY AND SELECTED CHEMICAL CONSTITUENTS IN RAINWATER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

DEPOSITION + *RAINOUT + AIR + *ANALYTICAL TECHNIQUE + CHEMICAL ANALYSIS + RADON + CONCENTRATION, AREA + WASHOUT

025597
HOLLAND JZ
PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE
U.S. ATOMIC ENERGY COMMISSION
15 PAGES, 12 FIGURES, 3 TABLES, 17 REFERENCES, PAGES 23-38, FROM COLLOQUE INTERNATIONAL SUR LA POLLUTION RADIOACTIVE DES MILIEUX GAZEUX (RADIOACTIVE POLLUTION OF GASEOUS MEDIA). BOOK I. SACLAY NOVEMBER 12-16, 1963

RADIONUCLIDES CAN BE INTRODUCED INTO THE UPPER TROPOSPHERE, STRATOSPHERE, MESOSPHERE, AND HIGHER LAYERS OF THE ATMOSPHERE BY BOTH PEACEFUL AND MILITARY USES OF NUCLEAR ENERGY. EXAMPLES OF PEACEFUL USES WHICH MIGHT RELEASE RADIOACTIVITY INTO THESE REGIONS ARE PROPULSION SYSTEMS AND AUXILIARY POWER SUPPLIES FOR OUTER-SPACE VEHICLES. THE PREDICTION AND THEREFORE CONTROL OF THE DISTRIBUTION AND FALLOUT OF SUCH CONTAMINANTS PRESENTS A NUMBER OF NOVEL SCIENTIFIC PROBLEMS. AN OUTLINE IS GIVEN OF THE USAEC COORDINATED PROGRAMS OF SAMPLING-DEVICE DEVELOPMENT, ANALYTICAL METHODS DEVELOPMENT, SAMPLE COLLECTION AND ANALYSIS, AND METEOROLOGICAL EVALUATION OF DATA.

AVAILABILITY - PRESSES UNIVERSITAIRES DE FRANCE, 108, BOULEVARD SAINT-GERMAIN, PARIS, VI, FRANCE

AEROSOL + CADMIUM + CARBON + CERIUM + CESIUM + ATMOSPHERIC DIFFUSION, CLIMATOLOGY + *ATMOSPHERIC DIFFUSION, GLOBAL + *FALLOUT + KRYPTON + ATMOSPHERIC STABILITY + SODIUM + *STRATOSPHERE + STRONTIUM + *SAMPLING + AIRCRAFT + COSMIC RADIATION + TUNGSTEN + *RADIOACTIVITY RELEASE + *MESOSPHERE + RHODIUM + *TROPOSPHERE + AGENCY, AEC

027021
FENIMORE JW
TRACING SOIL MOISTURE AND GROUNDWATER FLOW AT THE SAVANNAH RIVER PLANT
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S.C.
DP-MS-68-23 + CONF-680309-1 +. 25 PAGES, 14 FIGURES, 7 REFERENCES, MARCH, 1968

RADIOACTIVE WASTE MANAGEMENT IS A PROBLEM ASSOCIATED WITH THE PRODUCTION OF NUCLEAR MATERIALS AT THE SAVANNAH RIVER PLANT. GROUNDWATER FLOW IS IMPORTANT IN THE MANAGEMENT OF THREE CATEGORIES OF THIS WASTE - BURIED SOLID WASTE, LOW-LEVEL LIQUID WASTE DISCHARGED TO SEEPAGE BASINS, AND HIGH-LEVEL LIQUID WASTE STORED IN UNDERGROUND TANKS. TRITIUM TRACING METHODS ARE REPORTED FROM THE STANDPOINT OF STRATIGRAPHY, HYDROLOGY, FISSURES, ELEVATION, TYPE OF SOIL, ETC., WITH RESPECT TO EACH OF THE THREE CATEGORIES OF WASTE.

AVAILABILITY - J.W. FENIMORE, SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S.C. 29801

GEOLOGY + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *WASTE STORAGE + *SURFACE WATER, TRACER + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + *HYDROLOGY

027023
COREY JC
CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S. C.

027023 *CONTINUED*
DP-MS-67-95 +. 23 PAGES, 7 FIGURES, 2 TABLES, 16 REFERENCES, PRESENTED AT THE SYMPOSIUM ON ENVIRONMENTAL SURVEILLANCE IN THE VICINITY OF NUCLEAR FACILITIES, JANUARY 24-25, 1968, AUGUSTA, GEORGIA

TRITIATED WATER DEPOSITED ON THE SOIL RETURNS DIRECTLY TO THE ATMOSPHERE BY EVAPORATION FROM THE SOIL SURFACE AND BY TRANSPIRATION BY PLANTS. THE TIME FOR TRITIATED WATER TO EVAPORATE FROM A LOAMY SAND WAS MEASURED WHEN TRITIATED WATER WAS PLACED 0 TO 14, 14 TO 28, OR 28 TO 42 CM BELOW THE SURFACE AND FOR SOIL WATER CONTENTS OF 0.05 AND 0.10 G/G OF OVEN-DRY SOIL. THE EVAPORATION TIME INCREASED WITH THE DEPTH OF PLACEMENT AND WITH A DECREASE IN WATER CONTENT. TRITIATED WATER 14 TO 28 CM BELOW THE SOIL SURFACE DID NOT EVAPORATE BEFORE 60 HR. TRITIATED WATER 28 TO 42 CM BELOW THE SOIL SURFACE DID NOT EVAPORATE BEFORE 200 HR FROM SOIL WET TO 0.10 G/G OF OVEN-DRY SOIL, AND NOT BEFORE 300 HR FROM SOIL WET TO 0.05 G/G OF OVEN-DRY SOIL.

AVAILABILITY - J.C. COREY, SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S.C. 29801

*ECOLOGY + DEPOSITION + *EVAPORATION + *SOIL

027025
COREY JC + FENIMORE JW
TRACING GROUNDWATER WITH CHLORIDE IONS AND TRITIUM THROUGH ACID KAOLINITIC SOIL
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S. C.
DP-MS-67-64 +. 13 PAGES, 4 FIGURES, 13 REFERENCES, PROPOSED FOR PUBLICATION IN INTERNATIONAL JOURNAL OF APPLIED RADIATION AND ISOTOPES, APRIL, 1968

CHLORIDE IONS AND TRITIUM WERE COMPARED AS GROUNDWATER TRACERS FOR ACID SOILS CONTAINING KAOLINITIC CLAYS IN LABORATORY AND FIELD TESTS. THE BREAKTHROUGH FOR CHLORIDE WAS RETARDED MORE THAN THAT FOR TRITIUM, WHICH INDICATED THAT CHLORIDE IONS INTERACTED WITH THE ACID SOILS. THUS CHLORIDE AND OTHER NEGATIVELY CHARGED IONS HAVE LIMITED USEFULNESS AS WATER TRACERS IN ACID SOILS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

SOIL, RADIONUCLIDE MOVEMENT THROUGH + *SURFACE WATER, TRACER + SAVANNAH RIVER PLANT + ION EXCHANGE + DISPERSION + *EXPERIMENT + CHLORIDE

027078
COREY JC + HORTON JH
MOVEMENT OF WATER TAGGED WITH H-2, H-3, AND O-18 THROUGH ACIDIC KAOLINITIC SOIL
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, SOUTH CAROLINA
DP-MS-67-55 +. 25 PAGES, 3 FIGURES, 2 TABLES, 45 REFERENCES, PRESENTED AT THE MEETING OF THE SOIL SCIENCE SOCIETY OF AMERICA, WASHINGTON, D.C. NOVEMBER 10, 1967

MISCIBLE DISPLACEMENT TECHNIQUES WERE USED TO COMPARE THE BEHAVIOR OF DEUTERIUM, TRITIUM, AND O-18 AS WATER TRACERS. DISPLACEMENT OF A 170-ML PORTION OF TRIPLY TAGGED WATER THROUGH A 186-CM-LONG COLUMN OF WATER-SATURATED ACIDIC KAOLINITIC SOIL BY DISTILLED WATER REVEALED NO DIFFERENCES IN THE RELATIVE RATES OF MOVEMENT OF DEUTERIUM-, TRITIUM-, AND O-18-TAGGED WATER.

AVAILABILITY - J.C. COREY + J.H. HORTON, SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA 29801

*DEUTERIUM + DIFFUSION + *OXYGEN + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + TRACER, RADIOACTIVE + *HYDROLOGY + *ION EXCHANGE

028688
KLINE JR + JORDAN CF
TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST
PUERTO RICO NUCLEAR CENTER, CAPARRA HEIGHTS STATION, SAN JUAN
2 PAGES, 2 FIGURES, 6 REFERENCES, SCIENCE, 160, PAGES 550-51 (MAY 3, 1968)

TRITIATED WATER APPLIED TO THE SURFACE OF SOIL IN A TROPICAL RAIN FOREST WAS FOUND IN FREE WATER OF THE LITTER AND TOP 18 CENTIMETERS OF SOIL AS LONG AS 7 MONTHS AFTER THE APPLICATION. PLANT ROOTS, EVEN IN THE HIGH-RAINFALL ENVIRONMENT OF A TROPICAL RAIN FOREST, THEREFORE ARE EXPOSED TO TRIATED WATER FOR CONSIDERABLE PERIODS OF TIME AFTER RELEASE.

*ECOLOGY + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *RADIATION MODEL + RADIONUCLIDE, INDUCED + VEGETATION + CONCENTRATION

028902
LEVENTHAL JS + LIBBY WF
TRITIUM GEOPHYSICS FROM 1961-1962 NUCLEAR TESTS
DEPT. OF CHEMISTRY AND INSTITUTE OF GEOPHYSICS, UNIV. OF CALIFORNIA, LOS ANGELES, CALIF.
5 PAGES, 5 FIGURES, 1 TABLE, 10 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH, 73(8), PAGE 2715-2719, (APRIL 15, 1968)

TRITIUM FALLOUT FROM THE 1961-1962 NUCLEAR WEAPONS TESTS IN THE ARCTIC WAS MEASURED IN SOUTHERN CALIFORNIA AND LAKE MICHIGAN AND AT THE POLES. FROM THESE MEASUREMENTS THE STRATOSPHERIC RESIDENCE TIME FOR MOISTURE HAS BEEN DEDUCED TO BE ABOUT THREE YEARS. FROM THE OCEANIC TRITIUM DATA, THE YIELDS OF THE TESTS AND INCREASE IN SURFACE WATER HAVE BEEN CORRELATED. DATA CONFIRM

028902 *CONTINUED*
AND RE-ENFORCE EARLIER CONCLUSIONS ABOUT RE-EVAPORATION, RUNOFF, AND WIND TRANSPORT EFFECTS, GIVING A FIRMER BASE FOR THE CALCULATION OF THE TOTAL TRITIUM DEPOSITED AND THE ASSOCIATED PAST RAINFALL CONCENTRATIONS.

*DEPOSITION + *ATMOSPHERIC DIFFUSION, GLOBAL + *FALLOUT + RAINOUT + STRATOSPHERE + TESTING + *SURFACE WATER, NUCLIDE OCCURRENCE + *NUCLEAR EXPLOSION DEBRIS + TROPOSPHERE

030108
BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 - JUNE 30, 1968
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER
AECL-3158 +. 44 PAGES, 4 FIGURES, AUGUST 1968

HYDROGEN ISOTOPES IN THE HYDROLOGIC CYCLE - REGIONAL AND TIME VARIATIONS OF ISOTOPES OF HYDROGEN IN NATURAL WATERS CAN CONTRIBUTE VALUABLE INFORMATION ON MOVEMENT OF WATER THROUGH HYDROLOGIC CYCLE. TRITIUM, PRODUCED IN ATMOSPHERE BY COSMIC RADIATION OR RELEASED IN THERMONUCLEAR TESTS, SERVES AS TRACER FOR RECENT ATMOSPHERIC WATER AS IT IS TRANSFERRED THROUGH VARIOUS NATURAL RESERVOIRS OF THE WORLD--ATMOSPHERIC, CONTINENTAL AND OCEANIC. THE SMALL VARIATIONS OBSERVED IN NATURAL DEUTERIUM CONCENTRATIONS, ESTABLISHED BY ISOTOPIC FRACTIONATION IN EVAPORATIVE AND CONDENSATIVE PROCESSES IN NATURE, GIVE INFORMATION ON THESE ASPECTS OF HYDROLOGIC CYCLE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

CANADA + *ECOLOGY + DEPOSITION + *DEUTERIUM + *ATMOSPHERIC DIFFUSION + *HYDROGEN + OCEAN AND SEA + RAINOUT + STRATOSPHERE + TESTING + TRACER, RADIOACTIVE + *CONDENSATION + *SURFACE WATER, NUCLIDE OCCURRENCE + *GROUND WATER, NUCLIDE OCCURRENCE + NUCLEAR DETONATION + COSMIC RADIATION + EVAPORATION + ISOTOPIC FRACTIONATION + PRECIPITATION + DISPERSION + TROPOSPHERE

030129
JACOBS DG
SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
TID-24635 + ORNL-NSIC-39 +. 90P., DEC. 1968

AN ATTEMPT IS MADE IN THIS STATE-OF-THE-ART-REPORT TO SUMMARIZE SOME OF THE IMPORTANT PROPERTIES OF TRITIUM AND TO USE THESE PROPERTIES IN PREDICTING THE IMPACT OF DIVERSE RELEASES OF TRITIUM ON LOCAL AND WORLDWIDE POPULATIONS. DESPITE INADEQUACIES OF PRESENT INFORMATION ON THE BEHAVIOR OF TRITIUM, WE CAN CONCLUDE, IN OUR PRESENT POWER ECONOMY, TRITIUM POSES NO SEVERE WORLDWIDE EXPOSURE PROBLEMS. HOWEVER, IT WILL CONTINUE TO OFFER HANDLING AND ENVIRONMENTAL CONTAMINATION PROBLEMS. ALSO REPORTED IS INFORMATION CONCERNING SOURCES, ENRICHMENT, MONITORING, MOVEMENT, AND PROJECTED PRODUCTION OF TRITIUM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

DEPOSITION + DIFFUSION + DILUTION + CHROMATOGRAPHY + GROUND WATER + OCEAN AND SEA + RAINOUT + STRATOSPHERE + SURFACE CONTAMINATION + CONDENSATION + REACTOR, POWER + THERMAL CONSIDERATION + POPULATION EXPOSURE + EVAPORATION + HYDROLOGY + RADIATION SAFETY AND CONTROL + DISPERSION + RADIOACTIVITY RELEASE + ENVIRONMENT + TROPOSPHERE + FUEL REPROCESSING + RADIATION MONITORS + JACOBS

030457
HAINES A + MUSGRAVE BC
TRITIUM CONTENT OF ATMOSPHERIC METHANE AND ETHANE
UNIVERSITY OF ARKANSAS, FAYETTEVILLE
7 PAGES, J. GEOPHYS. RES., 73, PAGES 1167-73 (FEB. 15, 1968)

SAMPLES OF LIQUID OXYGEN COLLECTED AT GROUND LEVEL NEAR NEOSHO, MISSOURI, HAVE BEEN PROCESSED FOR RECOVERY OF METHANE, AND THE TRITIUM CONTENT OF THESE SAMPLES IS DISCUSSED IN TERMS OF POSSIBLE SOURCES OF THIS RADIOACTIVITY. THE CONTINUING RELEASE OF LABELED METHANE BY NUCLEAR INDUSTRY IS SUGGESTED BY THE FACT THAT THE T/H RATIO HAS NOT CHANGED APPRECIABLY DURING THE PERIOD 1958 TO 1966, ALTHOUGH THIS INTERVAL IS COMPARABLE TO THE CHEMICAL LIFETIME EXPECTED FOR METHANE IN THE ATMOSPHERE.

*AIRBORNE RELEASE + *ATMOSPHERIC DIFFUSION, CLIMATOLOGY + *ATMOSPHERIC POLLUTION

030475
BEGEMANN E + FRIEDMAN I
TRITIUM AND DEUTERIUM IN ATMOSPHERIC METHANE
MAX-PLANCK INSTITUT FUER CHEMIE, MAINZ
5 PAGES, J. GEOPHYS. RES., 73, PAGES 1149-53 (FEB. 15, 1968)

TEN SAMPLES OF ATMOSPHERIC METHANE COLLECTED AT OBERHAUSEN GERMANY, AND GARY, INDIANA, BETWEEN 1960 AND 1963 WERE ANALYZED FOR THEIR TRITIUM AND DEUTERIUM CONTENT. RESULTS SHOW THE TRITIUM CONCENTRATION IN THE NORTHERN HEMISPHERE TO HAVE BEEN ESSENTIALLY CONSTANT SINCE 1958, THE TIME THE FIRST SAMPLES WERE ANALYZED. EXISTING THEORIES TO EXPLAIN THE ORIGIN OF TRITIATED METHANE ARE DISCUSSED AND REJECTED AS HIGHLY IMPROBABLE. THE DATA CAN BEST BE EXPLAINED BY ASSUMING THAT LEAKAGE OF TRITIATED METHANE INTO THE ATMOSPHERE FROM SOURCES IN NUCLEAR INDUSTRY LOCATED IN THE NORTHERN HEMISPHERE OCCURRED FOR A PERIOD OF YEARS PRIOR TO 1958, AND THEN THE LEAK WAS

030475 *CONTINUED*
ESSENTIALLY CLOSED.

*AIRBORNE RELEASE + *ATMOSPHERIC DIFFUSION, CLIMATOLOGY + *DEUTERIUM + *ATMOSPHERIC POLLUTION + GERMANY

030682
CADLE RD
ROLE OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC TRITIATED METHANE
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH, BOULDER, COLO.
3 PAGES, J. GEOPHYS. RES., 72, PAGES 2251-3 (APRIL 15, 1967)

TRITIATED METHANE IN THE ATMOSPHERE RESULTS FROM TROPOSPHERIC EXCHANGE OF METHANE WITH TRITIATED HYDROGEN THAT HAS MIXED DOWNWARD FROM THE STRATOSPHERE. SPECIFICALLY, IT IS SUGGESTED THAT METHYLENE MAY BE PRODUCED FROM METHANE BY ELECTRICAL DISCHARGED AND OTHER IONIZATION PROCESSES IN THE LOWER ATMOSPHERE. AN EXPERIMENTAL INVESTIGATION WAS PERFORMED TO DETERMINE WHETHER ANY ATMOSPHERIC CONSTITUENTS WOULD REACT PREFERENTIALLY WITH METHYLENE PREVENTING ITS REACTION WITH TRITIATED HYDROGEN. IT WAS CONCLUDED THAT IT IS HIGHLY UNLIKELY THAT REACTIONS OF METHYLENE PRODUCE TRITIATED METHANE IN THE ATMOSPHERE.

*CHEMICAL REACTION + *STRATOSPHERE + *ATMOSPHERIC POLLUTION + *ATMOSPHERIC CHEMISTRY + ELECTROSTATIC CHARGE + CHEMICAL KINETICS

032094
TAYLOR CB
A COMPARISON OF TRITIUM AND STRONTIUM-90 FALLOUT IN THE SOUTHERN HEMISPHERE
19 PAGES, 4 FIGURES, 4 TABLES, REFERENCES, TELLUS 20(4), PAGES 559-577 (1968)

THE HISTORIES OF THO AND SR-90 FALLOUT IN THE SOUTHERN HEMISPHERE ARE COMPARED FOR DATA AVAILABLE TO JUNE 1966. THE SEASONAL VARIATION PATTERN FOR THO IN MID-LATITUDE RAIN WATERS IS CLOSELY REPRODUCED EVERY YEAR WITH PEAKS IN LATE WINTER-SPRING. SR-90 IS NOT SO CLOSELY REPRODUCED, WITH A BROAD SUMMER MAXIMUM. THE HISTORY OF THE THO/SR-90 ANNUAL MEAN ACTIVITY RATIO IS QUITE ERRATIC AND IS NOT CONSTANT OVER THE ENTIRE HEMISPHERE AT ANY ONE TIME.

ATMOSPHERIC DIFFUSION, GLOBAL + *FALLOUT + STRATOSPHERE + *STRONTIUM + *PRECIPITATION + NEW ZEALAND + TROPOSPHERE

033090
ANDERSON K
TRITIUM IN NEW YORK STATE WATERS, 1965
5 PAGES, 3 FIG., 3 TAB., 2 REF., PAGES 93 THRU 97 OF RADIOLOGICAL HEALTH DATA AND REPORTS, 10(3) (MARCH 1969)

THE STATES MAJOR RIVERS, CREEKS, AND LAKES WERE SAMPLED TO SEE WHAT VARIATIONS IN TRITIUM CONTENT OCCURRED THROUGHOUT THE STATE. SINCE MOST TRITIUM IN THE ATMOSPHERE FROM NUCLEAR WEAPONS PROBABLY REACHES THE SURFACE WATERS IN PRECIPITATION, ONE WOULD EXPECT THAT RUNNING WATER, SUCH AS IN CREEKS AND RIVERS (MADE UP OF RECENT PRECIPITATION RUNOFF) MAY BE HIGHER IN TRITIUM THAN LARGE, DEEP LAKES THAT CONTAIN OLDER WATER, THUS PROVIDING GREATER DILUTION.

DILUTION + FALLOUT + *RIVER + TESTING + *SURFACE WATER, NUCLIDE OCCURRENCE + NUCLEAR DETONATION + *PRECIPITATION + WASHOUT + *SURVEILLANCE PROGRAM + *LAKE

033384
GABAY JJ + SAX NI
SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MAPPING WITH TRITIUM
RADIOLOGICAL SCIENCES LAB., ALBANY
5 PAGES, ENVIRON. RES., 2, PAGES 72-6 (SEPT. 1968)

A TECHNIQUE FOR WIDE-AREA STACK EFFLUENT DISPERSION MAPPING IS DESCRIBED USING TRITIATED WATER AS A TRACER. THE SAMPLER CONSISTS OF INDICATING SILICA-GEL IN A FIBER-GLASS-SCREEN BAG CONVENIENTLY PLACED IN THE FIELD ALONG SAMPLING LEGS RADIATING OUT FROM THE SOURCE. THE ADSORBED WATER VAPOR IS REMOVED FROM THE SILICA GEL BY VACUUM DISTILLATION AND THE TRITIUM CONTENT DETERMINED BY LIQUID SCINTILLATION COUNTING. THIS TECHNIQUE HAS BEEN USED SUCCESSFULLY TO DISTANCES 10 MILES FROM A SOURCE TO EXPERIMENTALLY DETERMINE THE C-SUBMAX OF A STACK EFFLUENT FROM A NUCLEAR FUELS REPROCESSING PLANT WHICH ALREADY CONTAINED SOME TRITIATED WATER.

*EFFLUENT + TRACER, RADIOACTIVE + *STACK + *DISPERSION + OFF GAS + WATER VAPOR + OFF SITE

033922
DOURY A
RISK PRESENTED BY THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE
CEA, SERVICE DE CONTROLE DES RADIATIONS ET DE GENIE RADIOACTIF
CEA-N-489 +. 12 PAGES, 2 TABLES, 12 REFERENCES, JANUARY 1965 (IN FRENCH)

CONSIDERS THE RADIOLOGICAL HAZARD THAT ACCOMPANIES THE RELEASE OF TRITIUM TO THE ATMOSPHERE. PRESENTS TO ICRP THE ADMISSIBLE OR ACCEPTABLE CONTINUOUS RELEASE TO THE ATMOSPHERE.

FRANCE + MPC + HAZARD, RELATIVE + ATMOSPHERIC POLLUTION + ICRP + RADIOACTIVITY RELEASE

036248
ECOLOGICAL SCIENCES DIVISION ANNUAL PROGRESS REPORT. PERIOD ENDING SEPT. 30, 1971
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-4759 +. 188 PAGES, FIGURES, TABLES, REFERENCES, MARCH 1972

STUDIES OF RADIONUCLIDE CYCLING WERE - UPTAKE OF CS-137, CO-60, AND PU BY PLANTS; TRANSFER OF CS FROM ROOT TO SOIL; FOOD-CHAIN DYNAMICS (OF ARTHROPODS, SMALL MAMMALS, AND EARTHWORMS); EFFECTS OF MICROBIOTA AND SOIL FAUNA ON THE ENTRANCE OF ATMOSPHERIC POLLUTANTS INTO ECOSYSTEMS. STUDIES OF RADIATION EFFECTS INCLUDED RESCUE, SUNFLOWER, MICE, CRICKETS, AND GRASSHOPPERS. SYSTEMS ANALYSIS INCLUDED - A GENERALIZED COMPARTMENTAL COMPUTER MODEL FOR THE RADIONUCLIDE PATHWAY THROUGH FOOD CHAINS; A TWO-COMPARTMENT, THREE-PARAMETER MODEL FOR ABSORPTION AND RETENTION BY ANIMALS; AND NONRADIONUCLIDE-POLLUTANT APPLICATIONS. CERTAIN TOPICS WERE NOT FORMALLY REPORTED SINCE PERSONNEL WAS DIVERTED TO NUCLEAR POWER-PLANT ENVIRONMENTAL STATEMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + ECOLOGY + METAL + PLUTONIUM + SOIL, RADIONUCLIDE MOVEMENT THROUGH + ORNL + CRITICAL NUCLIDE PATHWAY + SOIL + THERMAL POLLUTION + *RADIONUCLIDE UPTAKE + ANIMAL + ANIMAL, INVERTEBRATE + ANIMAL, VERTEBRATE + BIOACCUMULATION/TURNOVER + VEGETATION + FOOD CHAIN + MINERAL CYCLING + *RADIONUCLIDE TRANSFER + *ECOSYSTEM + INSECT + ECOSYSTEM, FOREST + RADIATION EFFECT + ECOSYSTEM, MODEL + MAMMAL, SMALL + COMPUTER PROGRAM, DIGITAL

036413
JORDAN CF + KORANDA JF + MARTIN JR + KLINE JR
EXPERIMENTAL TEST OF A MATHEMATICAL MODEL PREDICTING TRITIUM MOVEMENT THROUGH A TROPICAL RAIN FOREST.
PUERTO RICO NUCLEAR CENTER, RIO PIEDRAS + LAWRENCE RADIATION LABORATORY + ARGONNE NATIONAL LABORATORY
TID-24933 + CONF-290508-2 +. 3 PAGES, MARCH 12, 1969

DISCUSSES AN EXPERIMENTAL TEST OF A MODEL TO PREDICT TRITIUM MOVEMENT THROUGH A TROPICAL ECOSYSTEM. A TEST WAS MADE, AND, AS PREDICTED, A SHARP RISE IN TRITIUM CONCENTRATION IN THE FREE WATER OF THE LITTER, SOIL, WOOD, AND LEAVES WAS OBSERVED. SPECIFIC ACTIVITY OF TRITIUM REACHED A MAXIMUM IN ALL COMPARTMENTS WITHIN A WEEK. THE PEAK WAS FOLLOWED BY A RATE OF DECREASE WITH A RESIDENCE HALF-TIME OF TRITIUM OF ABOUT SIX DAYS. SOME UNUSUAL CIRCUMSTANCES ARE ALSO POINTED OUT.

*ECOLOGY + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *CONCENTRATION, PEAK TO AVERAGE + *HYDROLOGY + PUERTO RICO + EXPERIMENT + *MODEL TESTING + VEGETATION + CONCENTRATION

036855
WEAVER CL + HARWARD ED + PETERSON HT
TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWER PLANTS
BUREAU OF RADIOLOGICAL HEALTH
9 PAGES, 3 TABLES, 12 REFERENCES, PUBLIC HEALTH REPORTS, 84(4), PG 363-371, APRIL 1969

INTENDED AS A GENERAL INFORMATION GUIDE ON TRITIUM FOR PERSONS IN FEDERAL, STATE, COUNTY, AND LOCAL PUBLIC HEALTH ACTIVITIES. THE VARIOUS SOURCES AND MECHANISMS FOR RELEASE OF TRITIUM AND ITS PATHWAY FROM NUCLEAR FACILITIES TO THE ENVIRONMENT ARE DESCRIBED.

ADMINISTRATIVE CONTROL + *COUNTER + *GUIDE + INGESTION + REGULATION + HAZARD, RELATIVE + *ACTIVATION PRODUCT + BETA EMITTER + *ANALYTICAL TECHNIQUE + POPULATION EXPOSURE + REACTOR + *ENVIRONMENT + LIQUID

037402
KORANDA JJ + ANSPAUGH LR + MARTIN JR
THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
13 PAGES, 8 FIGURES, 4 TABLES, 26 REFERENCES, IEEE TRANSACTIONS ON NUCLEAR SCIENCE, 19(1), PP. 27-39 (FEBRUARY 1972)

TRITIUM IS PRODUCED NATURALLY AND WAS PRESENT IN LOW CONCENTRATIONS IN PRECIPITATION AND NATURAL BODIES OF WATER BEFORE ATMOSPHERIC TESTING OF NUCLEAR WEAPONS. OTHER SOURCES OF TRITIUM ARE NOW PRESENT FROM WHICH TRITIUM IS RELEASED TO THE ENVIRONMENT. NUCLEAR REACTOR TRITIUM PRODUCTION, ACCORDING TO RECENT ESTIMATES, WILL EQUAL NATURAL TRITIUM PRODUCTION BEFORE THE YEAR 2000. PREDICTED INCREASES OF TRITIUM IN THE ENVIRONMENT WILL TAKE PLACE FIRST ON A LOCAL ECOLOGICAL LEVEL AND THEN APPEAR ON A BIOSPHERIC LEVEL. ITS BEHAVIOR IN THE ENVIRONMENT IS DISCUSSED.

*ECOLOGY + *WATER + *EVAPORATION + *HYDROLOGY + *PRECIPITATION + *RADIOACTIVITY RELEASE + ENVIRONMENT + WATER VAPOR + BEHAVIOR + *TRANSPIRATION + VAPOR EXCHANGE

038641
AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS
CONGRESS OF THE UNITED STATES
6 PAGES, PG 505-510 OF JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES, 1969

AT THESE HEARINGS CONCERN WAS EXPRESSED BY INTERESTED CITIZENS AS TO THE POSSIBLE ENVIRONMENTAL EFFECTS THAT MIGHT RESULT FROM ROUTINE RELEASES OF LOW LEVELS OF RADIOACTIVE HYDROGEN (TRITIUM) INTO THE BAY. THE BIOLOGICAL EFFECTS, IF ANY, OF EXPOSURES TO SUCH A LOW LEVEL WOULD BE TOO SMALL TO BE DETECTED, EVEN IF VERY LARGE POPULATIONS WERE EXPOSED, AND WOULD HAVE NO ECOLOGICAL SIGNIFICANCE. IN DERIVING LIMITS FOR TRITIUM APPLICABLE TO MEMBERS OF THE GENERAL PUBLIC, THESE EXPERT GROUPS HAVE TAKEN INTO ACCOUNT THE UNIQUE ENERGY AND ABSORPTION PROPERTIES OF TRITIUM AS

038641 *CONTINUED*
THEY RELATE TO DISTRIBUTION OF THE DOSE IN BODY TISSUE.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*NRC QUESTION + ECOLOGY + REACTOR, PWR + *POPULATION EXPOSURE + *CALVERT CLIFFS 1 (PWR) + CALVERT CLIFFS 2 (PWR)

039157
KORANDA JJ
RESIDUAL TRITIUM AT SEDAN CRATER
LAWRENCE RADIATION LABORATORY
CONF-670503 +. 13 PAGES, 13 FIGURES, REFERENCES, PG 696-708, MAY 17, 1967

RESIDUAL TRITIUM FROM THE SEDAN THERMONUCLEAR DETONATION, 6 JULY 1962, WAS SCAVENGED BY OR ENTRAINED IN THE 5-6 MILLION TONS OF EARTH MATERIALS MOVED BY THE DETONATION. AS A RESULT, THE SEDAN POST-SHOT ENVIRONMENT CONTAINED A MOST SIGNIFICANT BIOLOGICAL TRACER IN THE FORM OF THO. RESIDUAL TRITIUM (THO) IS FOUND IN MICROCI/ML CONCENTRATIONS IN THE INTERSTITIAL WATER OF THE SEDAN THROWOUT SOIL, AND IN THE LOOSE TISSUE WATER OF PLANTS WHICH HAVE RE-INVADED THE NEW SUBSTRATUM DEPOSITED ON THE LANDSCAPE ADJACENT TO THE CRATER. TRITIUM IS PRESENT IN LOOSE TISSUE WATER OF VASCULAR TISSUE-BOND HYDROGEN PLANTS. HERBIVORES, ALSO HAVE TRITIUM CONCENTRATIONS IN THEIR BODY WATER BETWEEN 1 AND 3 MICROCI/ML. 3 MICROCI/ML.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

ECOLOGY + FALLOUT + *TRACER + ANIMAL, AMPHIBIAN + CONCENTRATION FACTOR

040000
OTLET RL
LOW-LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL APPLICATIONS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WANTAGE, ENGLAND
CONF-680939 +. 8 PAGES, PP. 10-17 OF NUCLEONIC INSTRUMENTATION, LONDON, INSTITUTION OF ELECTRICAL ENGINEERS, 1968, FROM CONFERENCE ON NUCLEONIC INSTRUMENTATION, READING, ENGLAND

TRITIUM MEASUREMENTS CAN MAKE A SIGNIFICANT CONTRIBUTION TO MANY STANDARD GEOLOGICAL INVESTIGATIONS ON GROUNDWATER ORIGINS, MOVEMENT AND POTENTIALITIES. A LABORATORY HAS BEEN SET UP AT W.R.L. FOR TRITIUM MEASUREMENTS IN SAMPLES OF NATURAL WATER. THE PRINCIPLES AND TECHNICQUES CURRENTLY USED AT W.R.L. FOR THESE MEASUREMENTS ARE DESCRIBED.

AVAILABILITY - R.L. OTLET, UNITED KINGDOM ATOMIC ENERGY AUTHORITY, WANTAGE, ENGLAND

GEOLOGY + *GROUND WATER + *MEASUREMENT + *ANALYTICAL TECHNIQUE + HYDROLOGY

040040
SUESS HE
TRITIUM GEOPHYSICS AS AN INTERNATIONAL RESEARCH PROJECT
UNIVERSITY OF CALIFORNIA, SAN DIEGO, LA JOLIA
6 PAGES, SCIENCE, VOL. 163, PAGES 1405-10 (MARCH 28, 1969)

THE PRESENCE OF ARTIFICAL TRITIUM ON THE SURFACE OF THE EARTH PROVIDES AN OPPORTUNITY FOR THE STUDY OF A NUMBER OF PROBLEMS IN ENVIRONMENTAL SCIENCES. THE ENVIRONMENTAL TRITIUM CAN BE USED AS A TRACER FOR WATER VAPOR IN THE ATMOSPHERE, PRECIPITATION, RUNOFF, AND GROUNDWATER ON LAND, AND FOR THE VARIOUS WATER MASSES OF THE OCEANS. THE NEED FOR A WORLDWIDE AND LONG-RANGE PROGRAM IS DISCUSSED.

GEOLOGY + *SAMPLING + *METEOROLOGICAL SUPPORT + METEOROLOGY

040777
LEVEQUE P + VIGNEAUX M
RESULTS OF THE TRITIUM ACTIVITY MEASUREMENT OF SOME WATERS OF THE SOUTHWEST
FACULTE DES SCIENCES, BORDEAUX
4 PAGES, COMPTES RENDUS, VOL. 261, PAGES 4168-71 (NOVEMBER 15, 1965)(IN FRENCH)

MEASUREMENTS OF THE TRITIUM ACTIVITY OF RAIN WATER, LAKE WATER, WATER LEVELS, AND VEGETABLE WATER FURNISH, THANKS TO THE DISTRIBUTION OF THIS ISOTOPE, INFORMATION ON THE SEASONAL STRATIFICATION OF LAKES, THE FEED MECHANISM OF SURFACE LEVELS, AND THE EFFECT OF THE WATER LEVEL ON THE TRITIUM DISTRIBUTION IN SEVERAL COMMON VEGETABLES. ONLY THE UPPER FRINGE OF WATER LEVELS NOT INFLUENCED BY PUMPING SEEMED ACTUALLY INFLUENCED BY THE TRITIUM

FALLOUT + WATER + LAKE + CONCENTRATION + DISTRIBUTION + CYCLING

040781
KORANDA JJ
PRELIMINARY STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING GROUND
UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-12302-T +. 13 PAGES, HEALTH PHYSICS, VOL. 11, PAGES 1445-57 (DECEMBER 1965)

040781 *CONTINUED*
THE RESULTS OF A PRELIMINARY SURVEY OF DETONATION ENVIRONMENTS IN THE PACIFIC PROVING GROUNDS INDICATE THAT RESIDUAL TRITIUM AND C14 ARE PRESENT IN RELATIVELY HIGH CONCENTRATIONS IN SOIL MATERIALS OF THE DETONATION SITES AT TIMES UP TO 12 YEARS AFTER THE EVENT. EXCHANGE OF SOIL-BOUND TRITIUM WITH THE AVAILABLE SOIL WATER TAKES PLACE AT A SLOW BUT SIGNIFICANT RATE AND TRITIUM IS DETECTABLE IN PLANTS GROWING IN THE DETONATION ENVIRONMENTS. CARBON-14 IS ALSO ELEVATED IN THE TERRESTRIAL PLANTS. TRITIUM AND C14 ARE ALSO PRESENT IN ELEVATED CONCENTRATIONS IN MARINE ORGANISMS.

*CARBON + *NUCLEAR DETONATION + SOIL + ENVIRONMENT + CONCENTRATION + ANIMAL, AMPHIBIAN

042853
JORDAN CF
ECOLOGY - STUDIES OF A TROPICAL RAIN FOREST
PUERTO RICO UNIVERSITY
PRNC-129 +, 86 PAGES, PAGES 1-86, SECTION 1, DECEMBER 31, 1969

REPORTS ECOLOGICAL STUDIES OF A TROPICAL RAIN FOREST LOCATED AT AN ELEVATION OF 1500 FT ON THE SIDE OF EL YUNQUE MOUNTAIN IN EASTERN PUERTO RICO. CONTENTS OF CA, CU, FE, K, MG, MN, NA, AND P IN VARIOUS COMPARTMENTS OF THE ECOSYSTEM WERE DETERMINED FROM CONTENTS IN LEAVES, BARK, ROOTS, LITTER, ORGANIC MATTER IN THE FOREST AND BIOMASS OF THE SOIL. RATES OF MOVEMENT OF EACH ELEMENT WERE RELATED TO RAINFALL AND SEASON. FALLOUT DISTRIBUTION IN TROPICAL RAIN FOREST SYSTEMS WAS STUDIED IN TERMS OF SPECIES, SITE, CANOPY, AND PRESENCE OF EPIPHYLLS ON LEAVES. THE MOVEMENTS OF INJECTED CS-137, MN-54, RB-86, AND SR-85 THROUGH SELECTED SPECIES OF TREES WERE ALSO MEASURED AT VARIOUS TIMES, AND ACTIVITY IN THE SURROUNDING SOIL WAS DETERMINED. TRITIUM TRANSPORT WAS STUDIED IN A PLOT TO WHICH TRITIATED WATER WAS APPLIED BY SIMULATED RAINFALL.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

ELEMENTS AND ISOTOPES + FALLOUT + TRACER, RADIOACTIVE + *SOIL, NUCLIDE OCCURRENCE + EVAPORATION + PRECIPITATION + PUERTO RICO + BIOMASS + RESPIRATION + CONCENTRATION + *RADIONUCLIDE TRANSFER + DISTRIBUTION + *ECOSYSTEM, FOREST + *ECOSYSTEM, TROPICAL + RADIATION PROFILE + TRANSPORT + CYCLING

042995
SUTRA-FOURCADE Y
MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM
CEA-R-3350 + WAPD-TRANS-0102 +, 35 PAGES, DECEMBER 1967

DISCUSSES THE PROBLEMS POSED BY TRITIUM - ITS DETECTION, APPARATUS USED, PROTECTION OF PERSONNEL IN AN ATMOSPHERE CONTAMINATED WITH TRITIUM, THE DIFFUSION OF TRITIUM IN THE ATMOSPHERE, DECONTAMINATION, ETC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

DECONTAMINATION + ATMOSPHERIC DIFFUSION + ATMOSPHERIC POLLUTION + CONTAMINATION + PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + RADIATION MONITORS

043087
CARLSTON CW
TRITIUM-HYDROLOGIC RESEARCH. SOME RESULTS OF THE U. S. GEOLOGICAL SURVEY RESEARCH PROGRAM
GEOLOGICAL SURVEY, WASHINGTON, D. C.
3 PAGES, SCIENCE, VOL. 143, PAGES 408-6 (FEBRUARY 21, 1964)

TRITIUM IS OF LIMITED USEFULNESS AS A TOOL IN HYDROLOGIC STUDIES BECAUSE THE TRITIUM CONTENT OF GROUND WATER, AS A RESULT OF RADIOACTIVE DECAY, BECOMES TOO LOW TO BE DETECTABLE AFTER ABOUT 50 YEARS. A STUDY WAS MADE OF THE HYDROLOGIC CYCLE OF SMALL STREAM BASINS IN WISCONSIN AND NEW JERSEY ON THE BASIS OF MEASUREMENTS RELATIVE TO THE PEAK OF TRITIUM FALLOUT IN THE SPRING OF 1958. THE CONTINENTAL AND THE COASTAL BASINS RECEIVED APPROXIMATELY THE SAME TRITIUM FALLOUT. ABOUT 30 PERCENT WENT INTO GROUND-WATER STORAGE, THE REMAINDER BEING EXPORTED AS RUNOFF AND EVAPOTRANSPIRATION.

*FALLOUT + MEASUREMENT + *GROUND WATER, NUCLIDE OCCURRENCE + EVAPORATION + HYDROLOGY + R AND D PROGRAM + CONCENTRATION + TURNOVER RATE

043090
REICHERT SD
RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES
E. I. DUPONT DE NEMOURS AND COMPANY, AIKEN, S.C.

DISPOSAL OF RADIOACTIVITY TO THE GROUND HAS BEEN LIMITED TO THE BURIAL OF SOLID WASTE AND THE DISCHARGE OF VERY-LOW-LEVEL WASTE TO OPEN SEEPAGE BASINS. NO RADIONUCLIDES HAVE BEEN DETECTED IN GROUNDWATER FROM THIS SOURCE. SEEPAGE BASIN RETENTION OF RADIONUCLIDES HAS BEEN LESS SATISFACTORY. ALL OF THE RADIONUCLIDES RELEASED TO THE SEEPAGE BASINS, EXCEPT PLUTONIUM, HAVE BEEN DETECTED IN THE SURROUNDING GROUNDWATER. TRITIUM IS NOT ABSORBED AND THUS SERVES AS A USEFUL GROUNDWATER TRACER. STRONTIUM 90 IS POORLY ADSORBED ON LOCAL SOIL AND IS DETECTABLE IN SAND LAYERS, AT CONCENTRATIONS LESS THAN THE RADIOACTIVITY CONCENTRATION GUIDE, AS FAR AS 500 FEET FROM THE BASINS. THE PATH OF RADIONUCLIDE MIGRATION FROM SEEPAGE BASINS IS DETERMINED BY THE GEOLOGY AND HYDROLOGY OF EACH AREA.

043090 *CONTINUED*
ADSORPTION + GUIDE + GEOLOGY + *STRONTIUM + TRACER, RADIOACTIVE + *WASTE DISPOSAL, TERRESTRIAL + GROUND WATER, NUCLIDE OCCURRENCE + *SAVANNAH RIVER PLANT + HYDROLOGY + *SURVEILLANCE PROGRAM + MONITOR, AREA + CONCENTRATION

043099
ODEN S
THE OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA, WITH APPLICATIONS IN SOIL SCIENCE AND HYDROLOGY
INSTITUTIONEN FOER MARKLAERA, UPPSALA
21 PAGES, GRUNDFORBATTRING, VOL. 17, PP. 122-142 (1964)(IN SWEDISH)

AN ARTIFICIAL LABELING BY C-14 AND TRITIUM HAS OCCURRED IN ALL NATURAL RESERVOIRS. AT THE INTERNATIONAL METEOROLOGICAL INSTITUTE IN STOCKHOLM, EFFORTS HAVE BEEN MADE TO FOLLOW THIS LABELING IN TIME AND SPACE AND TO UTILIZE IT IN COMPUTATIONS OF RESERVOIR CHARACTERISTICS SUCH AS TURNOVER TIME, EXCHANGE PROPERTIES, AND DAMPING AND MASS CHARACTERISTICS. IN ADDITION TO A GLOBAL NETWORK FOR ATMOSPHERIC TRITIUM ASSAYS, A FAIRLY DENSE NETWORK HAS BEEN SET UP OVER SCANDINAVIA, INCLUDING THE MONITORING OF BOTH ATMOSPHERIC TRITIUM AND SURFACE AND GROUND WATER TRITIUM FROM DIFFERENT RESERVOIRS. THESE DATA ARE DISCUSSED AND CORRELATED WITH THE LONG-TERM TRITIUM VARIATIONS AS SHOWN BY OTHER STATIONS IN NORTHERN EUROPE.

*CARBON + ECOLOGY + ATMOSPHERIC DIFFUSION, GLOBAL + GROUND WATER + *ATMOSPHERIC POLLUTION + *SURFACE WATER, NUCLIDE OCCURRENCE + *MONITOR, ENVIRONMENTAL + HYDROLOGY + ION EXCHANGE + SOIL + *SURVEILLANCE PROGRAM + TURNOVER RATE

043102
KIGOSHI K
NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS
GAKUSHUIN UNIVERSITY, TOKYO
A/AC.87/G/L.693 +. 4 PAGES, AUGUST 1961

KR (10 TO 50 ML) WAS COLLECTED AT TOKYO FROM LIQUID OXYGEN OBTAINED FROM A SMALL-SCALE NITROGEN LIQUEFIER. A REMARKABLE INCREASE IN THE CONCENTRATION OF ATMOSPHERIC KR-85 AFTER THE MIDDLE OF 1960 IS SHOWN. ATMOSPHERIC CO2 WAS COLLECTED AT TOKYO BY ABSORPTION IN NAOH SOLUTION, AND THE RADIOACTIVITY WAS MEASURED. TREE RINGS WERE ANALYZED FOR C-14 AND TRITIUM CONCENTRATIONS. THE CONCENTRATION OF C-14 AND OF TRITIUM IN THE TREE RING ARE REGARDED AS AN ANNUAL MEAN VALUE OF THE C-14 CONCENTRATION IN THE ATMOSPHERE AND OF THE TRITIUM CONCENTRATION IN RAIN WATER. THE CONCENTRATION OF ATMOSPHERIC C-14 HAD A MAXIMUM VALUE AT THE BEGINNING OF 1960, AND THE CONCENTRATION OF TRITIUM DECREASED AFTER 1959 WITH A HALF LIFE OF ABOUT ONE YEAR. THE DATA ARE TABULATED.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

CRUSTACEAN + *CARBON + *KRYPTON + MEASUREMENT + *ATMOSPHERIC POLLUTION + SAMPLING + PRECIPITATION + BIOLOGICAL HALF-LIFE + *CONCENTRATION + PLANT, SPERMATOPHYTE

043106
KIGOSHI K + TOMIKURA Y
TRITIUM AND CARBON-14 IN THE TREE RINGS
GAKUSHUIN UNIVERSITY, TOKYO
2 PAGES, BULLETIN OF THE CHEMICAL SOCIETY OF JAPAN, VOL. 34, PAGES 1738-9 (NOVEMBER 1961) (IN ENGLISH)

MEASUREMENTS WERE MADE OF THE CONCENTRATION OF C-14 AND TRITIUM IN THE TREE RINGS OF RECENT YEARS IN ORDER TO OBTAIN THE ANNUAL MEAN CONCENTRATION OF THE ATMOSPHERIC C-14 AND OF THE TRITIUM IN THE RAIN WATER. THE DATA ON C-14 SHOWED A TENDENCY OF THE CONCENTRATION TO DECREASE AFTER 1960, AND IT SEEMED TO HAVE A MAXIMUM VALUE AT THE BEGINNING OF 1960. THE SAME WAS TRUE FOR TRITIUM CONCENTRATIONS. THE DATA SUGGESTED A STRATOSPHERIC RESIDENCE TIME OF 1 TO 2 YEARS.

*CARBON + *MEASUREMENT + RAINOUT + STRATOSPHERE + *ATMOSPHERIC POLLUTION + RADIONUCLIDE UPTAKE + *CONCENTRATION + *PLANT, SPERMATOPHYTE

043154
WOODS FW + ONEAL O
TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES
DUKE UNIVERSITY, N.C.
2 PAGES, SCIENCE, VOL. 147, PP. 148-49 (JANUARY 8, 1965)

TRITIUM WAS USED TO INVESTIGATE THE WITHDRAWAL BY SMALL TREES OF WATER FROM SOIL AT THREE DEPTHS. WITHIN 4 HOURS OF PLACEMENT AT EACH DEPTH, TRITIUM WAS DETECTED IN THE TRANSPIRED WATER FROM NEARBY TREES. ON THE 3RD DAY AFTER APPLICATION, 38 TIMES MORE TRITIUM (PER UNIT VOLUME) WAS PRESENT IN TRANSPIRED WATER DRAWN FROM SOIL AT A DEPTH OF 0 TO 30.5 CENTIMETERS THAN IN WATER DRAWN FROM THE 61- TO 91.5-CENTIMETER LEVEL.

*HEAVY WATER + *SOIL + EXPERIMENT + RADIONUCLIDE UPTAKE + *RESPIRATION + VEGETATION + *EXCRETION + RADIATION PROFILE + *ELIMINATION + PLANT

043272
ZELVENSKII YD + SHALYGIN VA + TATARINSKII VS + NIKOLAEV DA
A RELATIVE VOLATILITY OF HTO SOLUTIONS IN H2O

043272 - *CONTINUED*
3 PAGES, ATOMIC ENERGY/U.S.S.R., VOL. 18, PAGES 56-58 (JANUARY 1965) (IN RUSSIAN)

THE RELATIVE VOLATILITY OF HTO IN H2O SOLUTIONS AT 38 TO 100 C WAS DETERMINED BY A SIMPLE DISTILLATION METHOD AND RAYLEIGH EQUATIONS. THE DATA OBTAINED WERE SIMILAR TO THE DATA ON THE SEPARATION COEFFICIENT CALCULATED BY M.M. POPOV ET AL. (ATOMNAYA ENERGIYA 8, 420(1960)) ON THE BASIS OF T2O VAPOR PRESSURE.

EQUATION + *HEAVY WATER + *VAPOR PRESSURE + *VOLATILITY PROCESS + MATHEMATICAL TREATMENT + TEMPERATURE

043361
DOURY A
THE RISKS PRESENT IN THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE
COMMISSARIAT A L/ENERGIE ATOMIQUE, SACLAY, FRANCE
6 PAGES, MINERVA NUCLEARE, VOL. 9, PAGES 1-6 (JAN.-FEB. 1965) (IN FRENCH)

DATA ARE REPORTED ON THE QUANTITIES OF TRITIUM NORMALLY ENCOUNTERED IN NATURE AND THE PROCESSES BY WHICH HYDROGEN AND ITS ISOTOPES ARE SUSCEPTIBLE TO DIFFUSION IN THE TROPOSPHERE. SOME THEORETICAL STUDIES ARE PRESENTED ON THE MAXIMUM CONCENTRATIONS THAT COULD BE A CONSEQUENCE OF ACCIDENTAL DISCHARGES OF GREAT QUANTITIES OF TRITIUM IN THE ATMOSPHERE. THE POSSIBILITY OF CONTINUOUS DISCHARGE IS ALSO CONSIDERED. A HYPOTHESIS OF THE SPEED OF ISOTOPIC EXCHANGE BETWEEN GASEOUS TRITIUM AND STEAM FROM WATER IS SUGGESTED AND THE ORDERS OF SIZE OF DOSES OF EXTERNAL OR INTERNAL IRRADIATIONS RISKED DURING A STAY IN A CONTAMINATED AREA ARE GIVEN.

DIFFUSION + *RADIATION IN PERSPECTIVE + *ATMOSPHERIC POLLUTION + ACCIDENT, HYPOTHETICAL + DOSE CALCULATION, INTERNAL + POPULATION EXPOSURE + DOSE CALCULATION, EXTERNAL + CONTAMINATION + *TROPOSPHERE + CONCENTRATION

044109
CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.
BALTIMORE GAS AND ELECTRIC COMPANY
1 PAGE, THE WASHINGTON POST, SEPTEMBER 3, 1969

A PROMOTIONAL ADVERTISEMENT BY BGE CO. DEVOTED PRINCIPALLY TO INNOCUOUSNESS OF TRITIUM, VIZ. (1) CHESAPEAKE BAY WATER NOT DRINKABLE BECAUSE SALT WATER, (2) TO ACCUMULATE SO MUCH AS TO ACQUIRE SAME RELATIVE DOSE AS CHEST X-RAY, INDIVIDUAL WOULD NEED TO EAT 30 TONS FISH, CRABS, CLAMS AND OYSTERS, (3) NO BIOLOGICAL BUILDUP BECAUSE OF EXCHANGE MECHANISM, (4) EXPOSURE TO INDIVIDUAL IN SITE VICINITY WILL BE 0.0002 MILLIREM. ALSO, $4.4 MILLION PROCESSING SYSTEM INSTALLED TO REMOVE 99.999 PERCENT OF MOST NUCLIDES AND 97 PERCENT OF THE FEW REMAINING (EXCEPT TRITIUM).

FISSION PRODUCT RELEASE + *RADIATION IN PERSPECTIVE + REACTOR POWER + RADIOACTIVITY RELEASE + *CALVERT CLIFFS 1 (PWR) + *ENVIRONMENTAL CONTROL MEASURE + FOOD CHAIN + N-POWER, SAFETY OF + PROPONENT + SPOKESMAN, UTILITY

044378
PROCEEDINGS FROM VERMONT MEETING
ATOMIC INDUSTRIAL FORUM, INC.
1 PAGE, INFO. SERIES 26, APRIL 1970, PG 7

AEC HAS PUBLISHED PROCEEDING OF HISTORIC VERMONT PUBLIC MEETING. VOLUME CONTAINS (1) PRESENTATIONS OF AEC COMMISSIONERS AND SCIENTISTS, (2) PANEL DISCUSSION BETWEEN AEC AND FOUR PROMINENT CRITICS, (3) PRESS CONFERENCES WITH AEC CONTINGENCY AND CONSERVATIONISTS, (4) 100 PAGES OF WRITTEN QUESTIONS SUBMITTED BY AUDIENCE AND AEC ANSWERS, CONTAINING INFORMATION OF RELATIVE SAFETY OF LIGHT-WATER AND ADVANCED REACTORS, GOVERNMENT THERMAL POLLUTION STUDIES, RECONCENTRATION OF TRITIUM, AND AECS INFORMATION ACTIVITIES.

FISSION PRODUCT RELEASE + *REACTOR, POWER + *ENVIRONMENT + THERMAL POLLUTION + (TAMPLIN A) + N-POWER, SAFETY OF + OPPONENT + PROPONENT + *PUBLIC HEARING + PUBLIC RELATIONS + (TSIVOGLOU E)

044471
LARSON CE
ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS
U.S. ATOMIC ENERGY COMMISSION
38 PAGES, PG 238-275 OF THE HEARINGS BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES, NINETY-FIRST CONGRESS, FIRST SESSION, OCTOBER 28-31, NOVEMBER 4-6, 1969

STATEMENT OF C. F. LARSON, AEC COMMISSIONER ON ENVIRONMENTAL EFFECTS. RADIATION EFFECTS ARE EQUIVALENT TO JET-PLANE FLIGHT ONCE A YEAR. MICE STUDIES AT ORNL AT MUCH HIGHER IRRADIATION LEVELS SHOW VERY SMALL EFFECTS. EFFECTS AT ALLOWABLE LEVELS SO SMALL AS TO BE UNDETECTABLE BY PRESENT TECHNIQUES. GIVES DETAILS OF TYPES AND EFFORTS OF STUDIES ON ENVIRONMENTAL EFFECTS. INCLUDES RADIONUCLIDE CYCLING, SOMATIC AND GENETIC EFFECTS, TRITIUM, KRYPTON-85, THERMAL EFFECTS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*ECOLOGY + EFFLUENT + KRYPTON + REACTOR + THERMAL POLLUTION + *RADIONUCLIDE UPTAKE + FOOD CHAIN

044832
ESSINGTON EH + FENSKE PR + NORK WE
RADIOACTIVITY IN WATER - PROJECT MILROW

044832 *CONTINUED*
ISOTOPES, INC., PALO ALTO, CALIFORNIA
NVO-1229-135 +. 45 PAGES, MARCH 1970

DISCUSSES POST-MILROW EVENT CONDITIONS AT AMCHITKA RELATIVE TO EXPLOSION-PRODUCED RADIOACTIVITY IN WATER. EXPLOSION EFFECTS WHICH ARE RELATED TO MODIFICATION OF THE HYDROLOGIC SYSTEM ARE - (1) FORMATION OF A RUBBLE CHIMNEY AND COLLAPSE SINK, (2) FORMATION OF WATER SPOUTS ON THE ISLAND AND IN THE OCEAN DURING THE SEISMIC PHASE, (3) CREATION OF LINEATIONS IN THE OCEAN POSSIBLY RELATED TO FAULT AND FRACTURE SYSTEMS DURING THE SEISMIC PHASE, (4) FORMATION OF A LONG OPEN FRACTURE ABOUT 300 METERS FROM GROUND ZERO THAT ACTED AS A DRAIN FOR SURFACE WATER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DILUTION + OCEAN AND SEA + *PLOWSHARE + SEISMOLOGY + SOIL, RADIONUCLIDE MOVEMENT THROUGH + SURFACE WATER + MONITOR, BACKGROUND + *HYDROLOGY + *TRANSPORT THEORY + *MODEL TESTING + *SURVEILLANCE PROGRAM

045087
MASON BJ + WIPPER WJ + LEAVITT VD
TRITIUM UPTAKE FOLLOWING A THERMONUCLEAR TEST
PUBLIC HEALTH SERVICE, LAS VEGAS, NEVADA
STI/PUB-226 + CONF-690317 +. 8 PAGES, PG. 167-174 OF THE PROCEEDINGS OF THE SEMINAR ON AGRICULTURAL AND PUBLIC HEALTH ASPECTS OF ENVIRONMENTAL CONTAMINATION BY RADIOACTIVE MATERIALS, VIENNA, AUSTRIA, 1969

PRESENTS RESULTS OF A STUDY TO EVALUATE THE UPTAKE OF TRITIUM BY SELECTED CROPS THAT ARE IMPORTANT TO NEVADAS AGRICULTURAL ECONOMY. TO DETERMINE THE DISTRIBUTION OF TRITIUM FROM THIS DETONATION, A FOUR-STATION TRANSECT WAS LOCATED ALONG THE AXIS FROM THE SEDAN CRATER TO THE FARM FACILITY. A GRAPH OF THE 1968 TRITIUM PROFILE IN THE SOIL INDICATES A MAXIMUM CONCENTRATION AT A DEPTH OF APPROXIMATELY 70 CM. THIS DEPTH IS CLOSELY CORRELATED WITH THE DEPTH OF THE OF THE MAXIMUM DESERT RAINFALL PENETRATION FOR THIS AREA. THIS STUDY HAS INDICATED THAT TRITIUM IS AVAILABLE OVER CONSIDERABLE PERIODS OF TIME AND DOES NOT LEAVE THE ENVIRONMENT VIA EVAPORATION AS HAS BEEN SUGGESTED.

SURFACE CONTAMINATION + TESTING + *AGRICULTURE + *NEVADA TEST SITE + *NUCLEAR DETONATION + *SOIL, NUCLIDE OCCURRENCE + EVAPORATION + PRECIPITATION + CORRELATION + *RADIONUCLIDE UPTAKE + VEGETATION + DISTRIBUTION + RADIATION PROFILE + PLANT

045485
SCHELL WR + SAUZAY G + PAYNE BR
TRITIUM INJECTION AND CONCENTRATION DISTRIBUTION IN THE ATMOSPHERE
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA
16 PAGES, 6 FIGURES, 3 TABLES, 31 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH, 75(12), PG. 2251-2266 (APRIL 20, 1970)

A SIMPLIFIED MODEL WAS DEVELOPED TO RELATE INJECTION, EXCHANGE, EVAPORATION, CONDENSATION OF WATER VAPOR, AND TRITIUM TO METEOROLOGICAL PARAMETERS IN THE TROPOSPHERE. SINCE THE MODEL IN GENERAL, TRITIUM, FALLOUT RADIONUCLIDE, DEUTERIUM, AND OXYGEN-18 DATA CAN BE USED AS TRACERS. THE RESULTS OF THE INITIAL APPLICATION OF THE MODEL ARE PRESENTED.

STRATOSPHERE + TRACER, RADIOACTIVE + PRECIPITATION + MATHEMATICAL STUDY + TROPOSPHERE

047066
HEFT RE + HARRISON FL + PHILLIPS WA
RADIOECOLOGICAL STUDY OF THE HUMBOLDT BAY MARINE ENVIRONMENT
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-73168 + CONF-710818-3 +. 15 PAGES, FROM THE MEETING ON NUCLEAR METHODS IN ENVIRONMENTAL RESEARCH, COLUMBIA, MISSOURI, AUGUST 23, 1971

TRANSPORT IN THE ENVIRONMENT OF NUCLEAR-POWER-REACTOR WASTES IS BEING STUDIED AT HUMBOLDT BAY, CALIFORNIA, WITH THE EVENTUAL GOAL OF DEVELOPING A PREDICTIVE MODEL. MODELLING STUDIES INCLUDE SOURCE DESCRIPTION (SAMPLING WASTES), INTERPOOL TRANSPORT (A CDC 7600 COMPUTER PROGRAM IS BEING DEBUGGED), AND INTERPOOL EXCHANGE (MOVEMENT THROUGH ECOSYSTEM COMPARTMENTS). EXPERIMENTAL METHODS DETAILED INCLUDE - STABLE ELEMENTS BY NEUTRON ACTIVATION; COMPARTMENTAL UPTAKE OF GAMMA EMITTING RADIONUCLIDES AND TRITIUM AS A FUNCTION OF PH, SALINITY, AND TEMPERATURE; AND BIOMASS ASSAY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVATION + HUMBOLDT BAY (BWR) + COMPARISON, THEORY AND EXPERIENCE + WASTE DISPOSAL, OCEAN + SAMPLING + ESTUARY + CRITICAL NUCLIDE PATHWAY + GAMMA EMITTER + MATHEMATICAL TREATMENT + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + BIOMASS + FOOD CHAIN + *RADIONUCLIDE TRANSFER + SPECIFIC ACTIVITY + TEMPERATURE + ECOSYSTEM, MARINE + CONCENTRATION FACTOR + COMPARTMENT + ECOSYSTEM, MODEL + *ECOSYSTEM, ESTUARINE + COMPUTER PROGRAM, DIGITAL + EFFECT, PH + SALINITY

047170
KIGOSHI K + YONEDA K
DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC MOISTURE
GAKUSHUIN UNIVERSITY, TOKYO, JAPAN
4 PAGES, 8 FIGURES, 5 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH, 75(15), PG 2981-2984 (MAY 20, 1970)

047170 *CONTINUED*

OBSERVED DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC MOISTURE COLLECTED IN TOKYO FROM MAY 10 TO JUNE 2, 1966, AND FROM JULY 12 TO AUGUST 6, 1968, ARE PRESENTED. THE RELATION BETWEEN TRITIUM CONCENTRATION VARIATIONS AND THE MOVEMENT OF AIR MASSES OVER TOKYO IS DISCUSSED. HIGH TRITIUM CONCENTRATIONS INDICATE THE ARRIVAL OF CONTINENTAL AIR MASSES FROM THE NORTH, AND LOW TRITIUM CONCENTRATIONS INDICATE THE PRESENCE OF OCEANIC AIR MASSES. THE TRITIUM CONCENTRATIONS IN TROPICAL LOW-PRESSURE AIR MASSES WERE NEARLY EQUAL TO THAT OF SURFACE OCEAN WATER.

*JAPAN + METEOROLOGY + *WATER VAPOR + CONCENTRATION

047270
KIGOSHI K + YONEDA K
DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC MOISTURE
GAKUSHUIN UNIVERSITY, TOKYO, JAPAN
4 PAGES, 8 FIGURES, 5 REFERENCES, JOURNAL OF GEOPHYSICAL RESEARCH, 75(15), PP. 2981-1984 (MAY 20, 1970)

OBSERVED DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC MOISTURE COLLECTED IN TOKYO FROM MAY 10 TO JUNE 2, 1966, AND FROM JULY 12 TO AUGUST 6, 1968, ARE PRESENTED. THE RELATION BETWEEN TRITIUM CONCENTRATION VARIATIONS AND THE MOVEMENT OF AIR MASSES OVER TOKYO IS DISCUSSED. HIGH TRITIUM CONCENTRATIONS INDICATE THE ARRIVAL OF CONTINENTAL AIR MASSES FROM THE NORTH, AND LOW TRITIUM CONCENTRATIONS INDICATE THE PRESENCE OF OCEANIC AIR MASSES. THE TRITIUM CONCENTRATIONS IN TROPICAL LOW-PRESSURE AIR MASSES WERE NEARLY EQUAL TO THAT OF SURFACE OCEAN WATER.

*JAPAN + METEOROLOGY + *WATER VAPOR + CONCENTRATION

048899
STIGALL GF
EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN
NUS CORPORATION
NUS-TM-S-60 +. 17 PAGES, 1967

DISCUSSES THE QUESTION OF THE CAPACITY OF LAKE MICHIGAN TO RECEIVE AND ADEQUATELY DILUTE THE WASTES RELEASED TO IT. THE FIRST CONCERN IS THE LOCAL EFFECTS. THE SECOND IS A CONCERN OF THE TOTAL ASSIMILATIVE CAPACITY OF THE LAKE WITH A FUTURE OUTLOOK OF ADDED INJECTIONS. THE THIRD CONCERNS THE DILUTION OF A FEW PERCENT OF MPC BEFORE REACHING A SECOND PLANT FOUR AND ONE QUARTER MILES AWAY.

AVAILABILITY - NUS CORPORATION, 1730 M. STREET, N.W., WASHINGTON, D.C. 20036

CESIUM + DILUTION + FALLOUT + *MPC + STRONTIUM + WASTE DISPOSAL + DISPERSION + *WATER POLLUTION + *RECONCENTRATION + SYSTEM CAPACITY + ASSIMILATION + *LAKE MICHIGAN

050670
LIBBY WF
MORATORIUM TRITIUM GEOPHYSICS.
JOURNAL OF GEOPHYSICAL RESEARCH 68 PAGES 4485-4494 1963

FALLOUT + WATER + PRECIPITATION

050855
TAYLOR CB
TRITIUM CONTENT OF ANTARCTIC SNOW.
NATURE 201 PAGES 146-147 1964

SNOW

050988
BEGEMANN F
TRITIUM DETERMINATIONS IN ATMOSPHERIC GASES AND METEORITES. FINAL REPORT.
AFCRL-64-233 + AD-601129 +.

AIR + GAS

051130
KNOX JB
WATER QUALITY IN FLOODED CRATERS PRODUCED BY NUCLEAR EXCAVATION.
UCID-4741 +.

CERIUM + CESIUM + PLOWSHARE + RUTHENIUM + STRONTIUM + WATER + ION EXCHANGE + DISPERSION + FLOOD

051169
WOODS FW
TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES.
SCIENCE 147 PAGES 148-149 1965

WATER + EVAPORATION + VEGETATION + ECOSYSTEM + FIELD EXPERIMENT

051171
TAYLOR CB
ACCURACY IN THE DETERMINATION OF THE TRITIUM CONTENTS OF NATURAL WATERS IN THE SOUTH PACIFIC OCEAN AREA, 1959-63, AT THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, LOWER HUTT, NEW ZEALAND.
INS-R-27 +.

OCEAN AND SEA + WATER + NEW ZEALAND + OCEAN, PACIFIC + INSTRUMENTS, MISC.

051222
BIGELEISEN J
CHEMISTRY OF ISOTOPES.
SCIENCE 147 PAGES 463-471 1965

ELEMENTS AND ISOTOPES + CHEMICAL KINETICS

051272
IAEA
TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1
WP/17/1 + WP/17/2 + WP/17/3 + WP/17/4 + WP/17/5 + WP/17/1-5 + WP/17/6 +.

OCEAN AND SEA + RIVER + WATER + SAMPLING + PRECIPITATION + CONCENTRATION

051276
BROWN RM
DATING TRITIUM DISPERSAL IN GROUND WATER BY TREE RING ANALYSIS.
AECL-2107 +.

WATER + ECOSYSTEM, FOREST

051298
ERIKSSON E
AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE.
TELLUS 17 PAGES 118-130 1965

OCEAN AND SEA + ATMOSPHERIC POLLUTION + PRECIPITATION + EFFECT

051432
CHAMBERLAIN AC
WASHOUT OF TRITIATED WATER VAPOUR BY RAIN.
AERE-R-3970 + CONF-67-21 +. INTERNATIONAL JOURNAL OF AIR AND WATER POLLUTION 8 PAGES 135-149 1964

RAINOUT + WATER + PRECIPITATION + WASHOUT

051562
NAKAYAMA FS
DIFFUSION OF TRITIATED WATER IN SOILS.
SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 27 PAGES 255-258 1963

DIFFUSION + WATER + SOIL

051569
PARSONS PJ
THE MOVEMENT OF TRITIUM FROM THE CHALK RIVER LIQUID DISPOSAL AREA.
AECL-1739 + CRER-1146 +.

DIFFUSION + RIVER + WASTE DISPOSAL + REACTOR + LIQUID

051578
STEAD FW
TRITIUM DISTRIBUTION IN GROUND WATER AROUND LARGE UNDERGROUND FUSION EXPLOSIONS.
TID-18853 +. SCIENCE 142 PAGES 1163-1165 1963

051578 *CONTINUED*
DIFFUSION + EXPLOSION + PLOWSHARE + WATER + DISTRIBUTION

051840
PIPER AM
POTENTIAL APPLICATIONS OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES.
TEI-857 +.

DIFFUSION + PLOWSHARE + WATER + ION EXCHANGE + SOIL + EQUIPMENT DEVELOPMENT

052042
BUTLER GC
EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL REACTOR STACK.
AECL-1518 +.

DILUTION + STACK + AIR + PRECIPITATION + REACTOR + RATE + AECL + TRANSPORT

052495
KOCZY FF
RADIOACTIVITY IN OCEANOGRAPHY.
NUCL. RADIATION IN GEOPHYSICS 1 PAGES 18-46 1962

CARBON + OCEAN AND SEA + URANIUM + RADIUM + RADIOISOTOPE + RHENIUM + SEDIMENT

053221
HAZLETON-NUCLEAR S
VELA UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.
VUF-1014 +.

GROUND WATER + TRANSPORT

053417
SKAUEN DM
TRITIUM IN ECOLOGY. A REVIEW.
RADIOECOLOGY 6 PAGES 603-609 1963

ECOLOGY + REVIEW

053552
DOURY A
HAZARDS OF THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE.
CONF-640413 + ORNL-TR-1482 +.

DIFFUSION + DOSE + ATMOSPHERIC POLLUTION

053760
DOCKINS KO
TRITIUM IN THE MIXED LAYER OF THE NORTH PACIFIC OCEAN.
SM-87/56 + PB-174711 +.

OCEAN AND SEA + LAYER + OCEAN, PACIFIC

053772
KORANDA JJ
RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.
UCRL-50360 +.

PLOWSHARE + SOIL + CANAL

053779
ODUM HT
BIOENVIRONMENTAL AND RADIOLOGICAL-SAFETY FEASIBILITY STUDIES, ATLANTIC-PACIFIC INTEROCEANIC CANAL. HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TR
BMI-171-002 +.

HYDROGEN + SURFACE WATER + PRECIPITATION + CANAL + RADIOLOGY + MATHEMATICS + MODEL + ECOSYSTEM, FOREST + COMPARTMENT

054493
IAEA
TRITIUM AND OTHER ENVIRONMENTAL ISOTOPES IN THE HYDROLOGICAL CYCLE. PART I. REVIEW OF THE ENVIRONMENTAL ISOTOPES AND THEIR ROLE IN THE INVESTIGATION OF THE HYDROSPHERE.
STI/DOC/10/73 +.

ELEMENTS AND ISOTOPES + ENVIRONMENT + REVIEW

054494
BROWN RM
TRITIUM IN PRECIPITATION AT CANADIAN SITES (1953-1963).
STI/DOC/10/73 +.

CANADA + SITING + PRECIPITATION

054496
TAYLOR CB
TRITIUM IN SOUTHERN HEMISPHERE PRECIPITATION (1953-1964).
STI/DOC/10/73 +.

PRECIPITATION

055002
MASON BJ + BROWN KW + HOP HW + MILLER CL
DESERT VEGETATION UPTAKE OF TRITIUM FROM PROJECT GASBUGGY EFFLUENT
WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS, NEVADA
PNE-G-78 +. 15 PAGES, NOVEMBER 29, 1971

TEST FLARING OF A NUCLEAR-EXPLOSION-STIMULATED GAS WELL PRODUCED AN EMISSION PLUME WHICH CAUSED MEASURABLE TRITIUM CONTAMINATION OF NEARBY VEGETATION. ALTHOUGH CONTAMINATION PEAKED AT ABOUT 2 MILES FROM THE SOURCE, AS PREDICTED BY PASQUILL'S EQUATION, THE SCATTERING OF DATA PREVENTED A DETAILED TEST OF THE EQUATION. RELATIVELY HIGH CONTAMINATION OCCURRED IN CANYONS, WHICH MAY BE EXPLAINED BY MOVEMENT OF AIR MASSES THROUGH THESE LOCATIONS AT NIGHT, ALTHOUGH THIS EXPLANATION IS SPECULATIVE AT PRESENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*WATER + WIND PROFILE + PLUME BEHAVIOR + NEVADA TEST SITE + WIND STATISTICS + FUEL, FOSSIL + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + *VEGETATION + PLANT, SPERMATOPHYTE + STIMULATION + RESOURCE, NATURAL

055111
BARTON CJ + BUTLER HM + CUMMING RB + ROHWER PS
THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS
11 PAGES, 1 TABLE, 2 REFERENCES, NUCLEAR SAFETY, 13(3), PP. 225-235 (MAY-JUNE 1972)

A TRITIUM SYMPOSIUM SPONSORED BY THE WESTERN ENVIRONMENTAL RESEARCH LABORATORY OF THE ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA AT LAS VEGAS WAS HELD IN LAS VEGAS AUG. 30 TO SEPT. 2, 1971. NEARLY 100 PAPERS WERE PRESENTED COVERING A BROAD RANGE OF TOPICS, INCLUDING TRITIUM PRODUCTION, ITS MOVEMENT IN THE ENVIRONMENT, ENVIRONMENTAL RELEASE AND MONITORING, DETECTION AND MEASUREMENT, BIOLOGICAL EFFECTS, BIOKINETICS, APPLICATIONS IN BIOLOGY AND MEDICINE, AND HEALTH PHYSICS. THIS ARTICLE TOUCHES ON ALL ASPECTS OF THE MEETING, BUT PAPERS OF PARTICULAR INTEREST IN THE FIELD OF NUCLEAR SAFETY ARE EMPHASIZED.

*AIRBORNE RELEASE + *BIOMEDICAL + MONITOR, LIQUID + *MONITOR, AIR + ANALYTICAL TECHNIQUE + *MONITORING SYSTEM, RADIATION

055973
MULLINS JW + STEIN JL
EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968-DEC. 1969
WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS, NEVADA + SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY
9 PAGES, 3 FIGURES, 1 TABLE, 9 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 13(2), PP. 59-67 (FEBRUARY 1972)

TO ESTABLISH A BASELINE FOR ENVIRONMENTAL TRITIUM A STUDY WAS CONDUCTED TO MEASURE CURRENT LEVELS OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES. DATA ARE REPORTED FOR TRITIUM CONCENTRATIONS IN SURFACE AND GROUND WATERS DURING APRIL 1968-DECEMBER 1969. THE CONCENTRATION OF TRITIUM WAS NONDETECTABLE IN MOST GROUND-WATER SAMPLES, WHILE OTHER SAMPLES CONTAINED AS MUCH AS 2.6 NCI/LITER. SURFACE WATER SAMPLES RANGED FROM NONDETECTABLE TO 3.8 NCI/LITER. POSSIBLE REASONS FOR THE RANGE OF RESULTS, SUCH AS ALTITUDE AND LATITUDE EFFECTS, ARE DISCUSSED.

SAMPLING, HIGH ALTITUDE + *ANALYTICAL TECHNIQUE + *MONITOR, ENVIRONMENTAL + *GROUND WATER, NUCLIDE OCCURRENCE + *MONITOR, GROUND SURFACE + UNITED STATES + *SURVEILLANCE PROGRAM + *CONCENTRATION

056628
MARTIN, JR + JORDAN, CF + KORANDA, JJ + KLINE, JR
RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY
CONF-700101(VOL.1) +. 17 PAGES, PP. 422-438 OF THE PROCEEDINGS OF THE SYMPOSIUM ON ENGINEERING WITH NUCLEAR EXPLOSIVES, LAS VEGAS, NEVADA, JANUARY 14-16, 1970

SEVERAL EXPERIMENTS ON THE MOVEMENT OF TRITIUM IN A TROPICAL ECOSYSTEM HAVE BEEN CONDUCTED IN THE MONTANE RAINFOREST OF EASTERN PUERTO RICO. TRITIATED WATER WAS USED AS A TRACER FOR WATER MOVEMENT IN, MATURE EVERGREEN TREES OF THE CLIMAX RAINFOREST, SOIL AND SUBSTORY VEGETATION, AND RAPIDLY GROWING SUCCESSIONAL SPECIES. BASED ON ALL EXPERIMENTAL DATA, THE DISTRIBUTION OF TRITIUM FROM A SIMULATED RAINOUT FOLLOWING A ONE MEGATON THERMONUCLEAR DETONATION IS PRESENTED FOR A CLIMAX TROPICAL RAINFOREST AND FOR SUCCESSIONAL VEGETATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FALLOUT + ECOSYSTEM + ECOSYSTEM, FOREST + ECOSYSTEM, TROPICAL

057383
WYERMAN TA + FARNSWORTH RK + STEWART GL
TRITIUM IN STREAMS IN THE UNITED STATES, 1961-1968
WATER RESOURCES DIVISION, U.S. GEOLOGICAL SURVEY + ENVIRONEMTNAL SCIENCES SERVICES ADMINISTRATION, MARYLAND + UNIVERSITY OF MASSACHUSETTS
19 PAGES. 20 TABLES, RADIOLOGICAL HEALTH DATA AND REPORTS, 11(9), PG 421-439 (SEPTEMBER 1970)

AS PART OF ITS PROGRAM OF WATER RESOURCES INVESTIGATIONS, THE U.S. GEOLOGICAL SURVEY HAS BEEN ANALYZING THE TRITIUM CONTENT OF STREAM WATER SINCE THE EARLY 1960S. THE RESULTS FOR 20 STREAMS IN THE CONTERMINOUS UNITED STATES AND ALASKA ARE TABULATED ALONG WITH RELEVANT STREAM DISCHARGE DATA. THE DATA SHOW THE EFFECT ON STREAM TRITIUM CONCENTRATION CAUSED PRINCIPALLY BY THERMONUCLEAR DETONATIONS, AND ALSO SEASONAL, LATITUDINAL, AND CONTINENTAL EFFECTS.

*SURFACE WATER, NUCLIDE OCCURRENCE + HYDROLOGY + UNITED STATES + ALASKA + *SURVEY

057579
VAUBERT, P + BITTEL, R
THE HAZARD FROM TRITIUM CONTAMINATION
CENTRE D/ETUDES NUCLEAIRES DE FONTENAY-AUX-ROSES, FRANCE
CEA-BIB-182 + FUR-4522F +. 1970

CONTENTS - OBJECTIVE OF THIS REPORT. NUCLEAR CHARACTERISTICS. FORMATION AND ASSOCIATED HAZARDS. BEHAVIOR VIS-A-VIS HYDROGEN, OXYGEN, WATER AND VARIOUS ORGANICS OF BIOLOGICAL IMPORTANCE. RADIOCHEMISTRY. EXCHANGE REACTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIBLIOGRAPHY + OCEAN AND SEA + RADIATION IN PERSPECTIVE + *HAZARD, RELATIVE + RIVER + *LAKE + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER

058730
JORDAN CF + KORANDA JJ + KLINE JR + MARTIN JR
TRITIUM MOVEMENT IN A TROPICAL ECOSYSTEM
ARGONNE NATIONAL LABORATORY, ILLINOIS + LAWRENCE RADIATION LABORATORY, CALIFORNIA
6 PAGES, 6 FIGURES, 1 TABLE, 17 REFERENCES, BIOSCIENCE, 20(14), PG. 807-812 (JULY 15, 1970)

RESULTS OF AN EXPERIMENTAL STUDY ARE COMPARED WITH STUDIES BY OTHERS. CONCLUSIONS - THE PORTION OF THE PULSE OF WATER MOVING ON THROUGH THE SUBSOIL MAINTAINS A NEAR-SYMMETRICAL DISTRIBUTION WHILE THE WATER ABOVE THE DISCONTINUITY RECORES MIXED WITH OTHER WATER COMING IN FROM ABOVE. MOVEMENT OF TRITIUM IN THE SOIL IS THE RATE-LIMITING STEP ON THE MOVEMENT OF TRITIUM THROUGH SOIL AND PLANTS INTO AIR.

*SOIL, RADIONUCLIDE MOVEMENT THROUGH + PUERTO RICO + *RADIONUCLIDE UPTAKE + ECOSYSTEM + *ECOSYSTEM, TROPICAL + *PLANT

059243
BARRY PJ + MERRITT WF
THE PERCH LAKE EVAPORATION STUDY
ATOMIC ENERGY OF CANADA, CHALK RIVER (ONTARIO)
AECL-3557 + SM-129/10 + CONF-700328-2 +. 16 PAGES, FROM CONFERENCE ON THE USE OF RADIOISOTOPES IN HYDROLOGY, VIENNA, AUSTRIA, FEBRUARY 1970

THE PRIMARY PURPOSE OF THE PERCH LAKE PROJECT IS TO EXPLOIT THE USE OF RADIOACTIVE TRACERS IN THE STUDY OF ALL ASPECTS OF THE HYDROLOGICAL CYCLE IN A SMALL, WELL-DEFINED BASIN. WITHIN THIS BROAD OBJECTIVE A NUMBER OF INDIVIDUAL STUDIES ARE BEING CONDUCTED, OF WHICH ONE, THE USE OF TRITIATED WATER VAPOUR FOR THE STUDY OF EVAPORATION MECHANISMS IN A NATURAL SETTING, IS BELIEVED TO BE UNIQUE. OTHER STUDIES INCLUDE THE DETERMINATION OF THE WATER, TRITIATED WATER, ENERGY, AND TRACE-ELEMENT BUDGETS OF THE LAKE, OF WHICH THE FIRST THREE COMPLEMENT THE USE OF TRITIATED WATER VAPOUR TO STUDY BASIC EVAPORATION MECHANISMS. RADIOACTIVE TRACERS HAVE BEEN USED PARTICULARLY FOR ESTIMATING THE GROUND-WATER COMPONENTS OF THE WATER AND TRITIUM BUDGETS. GROUND-WATER FLOWS

059243 *CONTINUED*
PREDICTED BY THE USE OF CONVENTIONAL HYDROLOGICAL TECHNIQUES AS WELL AS VARIOUS NEW MODELS ARE BEING COMPARED WITH THE RESULTS OBTAINED BY USING RADIOACTIVE TRACERS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CANADA + GROUND WATER + *TRACER, RADIOACTIVE + *ANALYTICAL TECHNIQUE + TRACER + *EVAPORATION + HYDROLOGY + *THERMAL POLLUTION + *LAKE

060477
TAYLOR CB
A COMPARISON OF TRITIUM AND SR-90 FALLOUT IN THE SOUTHERN HEMISPHERE
UNIVERSITY HEIDELBERG, GERMANY
18 PAGES, TELLUS, VOL. 20, PP. 559-576 (1968)

THE HISTORIES OF TRITIUM AND SR-90 FALLOUT IN THE SOUTHERN HEMISPHERE WERE COMPARED FROM THE DATA AVAILABLE TO JUNE 1966. THE SEASONAL VARIATION PATTERN (JULY TO JUNE) FOR TRITIUM IN MID-LATITUDE OCEANIC RAINWATERS WAS FAIRLY CLOSELY REPRODUCED FROM YEAR TO YEAR, AND PEAKED IN LATE WINTER TO SPRING. THE PEAK COINCIDED WITH THE ABSENCE OF THE TEMPERATURE INVERSION AT THE POLAR TROPOPAUSE, SUGGESTING THAT THE STRATOSPHERE-TROPOSPHERE EXCHANGE OF THE BULK OF SOUTHERN HEMISPHERE TRITIUM FALLOUT TOOK PLACE OVER THE POLAR REGIONS. FOR SR-90 IN MID-LATITUDE RAINWATERS, THE SEASONAL VARIATION PATTERN WAS NOT SO CLOSELY REPRODUCED FROM YEAR TO YEAR BUT SHOWED A BROAD SUMMER MAXIMUM AND WINTER MINIMUM.

ATMOSPHERIC CIRCULATION, GLOBAL + *FALLOUT + *STRONTIUM

060857
KERY PW + KRAJEWSKI B
TROPOSPHERIC SCAVENGING OF SR90 AND H3
HEALTH AND SAFETY LABORATORY, U.S. ATOMIC ENERGY COMMISSION, NEW YORK
CONF-700601 +. 15 PAGES, PG 447-462 OF THE PROCEEDINGS OF A SUMPOSIUM ON PRECIPITATION SCAVENGING, RICHLAND, WASHINGTON, JUNE 2-4, 1970

TROPOSPHERIC INVENTORIES OF TRITIUM AS HTO ARE CALCULATED FOR THE YEARS 1963, 1964, AND 1965 WITH DATA FROM THE PRECIPITATION NETWORK OF THE INTERNATIONAL ATOMIC ENERGY AGENCY. THE PREVIOUSLY REPORTED HALF RESIDENCE TIME OF 30 DAYS FOR SR-90 WAS VERIFIED, AND A SURPRISINGLY LOW OVERALL HALF RESIDENCE TIME OF 10 DAYS WAS FOUND FOR HTO. THIS OVERALL 10-DAY VALUE IS THE RESULT OF TRITIUM REMOVAL BY PRECIPITATION AND BY VAPOR EXCHANGE WITH THE OCEANS. THE HALF RESIDENCE TIME FOR HTO REMOVED BY PRECIPITATION IS 28 DAYS BUT ONLY 16 DAYS BY VAPOR EXCHANGE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FALLOUT + *STRONTIUM + *AEROSOL, RADIOACTIVE + PRECIPITATION + TROPOSPHERE + *WASHOUT + GAS

061104
KIEFER H + KONIG LA + WINTER M
STUDY OF PROPAGATION OF ATMOSPHERIC POLLUTANTS WITH THE AID OF TRITIUM
7 PAGES, KERNTECHNIK, 12(5/6), PP. 212-218 (JUNE 1970)

REPORTS ON EXPERIMENTS WITH TRITIATED WATER EMITTED TO THE ATMOSPHERE. THE RESULTS WERE COMPARED WITH THE GENERALIZED GAUSSIAN FORMULA, AND THE AGREEMENT WAS WITHIN A FACTOR OF 2.

ATMOSPHERIC DIFFUSION EXPERIMENT + LAPSE RATE, ADIABATIC, NEUTRAL + CONCENTRATION, GROUND LEVEL + SOURCE, ELEVATED

061130
BASSON JK + VANAS D + VLEGGAAR CM + VANDERWESTHUSIZEN
RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE
11 PAGES, SOUTH AFRICAN JOURNAL OF SCIENCE, 66(7), PP. 214-225

MEASUREMENTS SINCE 1963 WITH SPECIAL ATTENTION TO 1966-67 SHOWED THE FRENCH NUCLEAR TESTS DID NOT PRODUCE A HAZARDOUS INCREASE. ANALYSES OF AIRBORNE FALLOUT, SR-90 IN MILK, CS-137 IN BONE. TRANSIT TIME AND AGE ANALYSIS, THE RATIO OF CE-144/CS-137 INDICATED FALLOUT AGE, AND SHOWED FALLOUT TOWARDS THE END OF 1966. INCREASES IN CUMULATIVE SR-90 DEPOSITION AND H-3 IN RAIN WERE ATTRIBUTABLE TO INTERHEMISPHERIC MIXING. THE AVERAGE DOSE RATE FOR THE POPULATION WAS CALCD. TO BE 0.9 MRAD/YEAR TO GONADS AND 3.3 TO THE BONE MARROW. (CA 74-10119 N)

CERIUM + CESIUM + *FALLOUT + STRONTIUM + DOSE CALCULATION, INTERNAL + *POPULATION EXPOSURE + *SOUTH AFRICA + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + BONE, MARROW + TESTIS

061201
SAX NI + DALY JC + GABAY JJ
A TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING TRITIATED MOISTURE
NEW YORK STATE DEPARTMENT OF HEALTH, ALBANY
7 PAGES, NUCLEAR APPLICATIONS AND TECHNOLOGY, VOL. 7, PG. 106-112 (JULY 1969)

A SILICA GEL SAMPLER FOR TRITIATED MOISTURE WAS DEVELOPED TO TRACE THE EFFLUENT FROM A NUCLEAR

061201 *CONTINUED*
FUEL REPROCESSING PLANT. AN EXTENSIVE STUDY OF THE AREA SURROUNDING NUCLEAR FUEL SERVICES, INC., TO DETERMINE EXPERIMENTALLY THE MAXIMUM CONCENTRATION OF THE STACK EFFLUENT. BASED ON EXPERIMENTAL MAXIMUM CONCENTRATION VALUES, AN ESTIMATE OF THE EMISSION RATE WAS MADE UNDER VARIOUS METEOROLOGICAL CONDITIONS.

*CONCENTRATION, MAXIMUM + ATMOSPHERIC DIFFUSION EXPERIMENT + TRACER, RADIOACTIVE + *SAMPLING + SOURCE, ELEVATED

061721
PLANET J + UZZAN G + LE GRAND J
HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER
CEA, FONTENAY-AUX-ROSES, FRANCE
2 PAGES, HEALTH PHYSICS, VOL. 19, PP. 100-102 (1970)

CONTAMINATION MECHANISMS ARE (1) INHALATION AND SKIN ABSORPTION AND (2) INGESTION OF CONTAMINATED FOOD. THE DOSE TO POPULATIONS WAS ESTIMATED BY CONSIDERING DISPERSION IN THE AIR AS A FUNCTION OF METEOROLOGICAL CONDITIONS, CONTAMINATION OF RAIN BY WASHOUT FROM THE ATMOSPHERE, CONTAMINATION OF THE WATER TABLE, CONTAMINATION OF VEGETABLE PRODUCTS TAKING INTO ACCOUNT THE EXCHANGE OF WATER IN THE VAPOUR PHASE BETWEEN THE ATMOSPHERE AND THE EXPOSED PARTS OF PLANTS, OF THE FOLIAR ABSORPTION OF TRITIATED WATER, AND OF UPTAKE THROUGH THE ROOTS, CONTAMINATION OF MILK AND MEAT FROM PASTURE AND FROM THE METHOD OF REARING LIVESTOCK.

*INHALATION + RAINOUT + *WASTE DISPOSAL, ATMOSPHERIC + MILK + WATER, DRINKING + ABSORPTION + RADIONUCLIDE UPTAKE + *FOOD CHAIN + LIVESTOCK + MAN + SKIN

061927
KELLY MJ + BOOTH RS
QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - TRANSFER OF TRITIUM TO MAN FROM AN INITIAL WET DEPOSITION
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-2134 +. 22 PAGES, JANUARY 8, 1971

THE TOTAL DOSE TO MAN FROM TRITIUM CONTAMINATION OF SOIL WAS ESTIMATED BY SIMULATING THE MOVEMENT OF TRITIUM THROUGH THE SOIL AFTER AN INITIAL WET DEPOSITION AS A DIFFUSION PROCESS WITH A SUPERIMPOSED TRANSLATION CAUSED BY RAINFALL. ONLY EXPERIMENTALLY DEMONSTRABLE CONSTANTS WERE INCORPORATED INTO THE MODEL, AND IT WAS QUALITATIVELY TESTED AGAINST EXPERIMENTAL RESULTS. INSTANTANEOUS EQUILIBRIUM WAS ASSUMED BETWEEN THE TRITIUM CONCENTRATION IN THE SOIL COMPARTMENT AND THE FOOD THAT MAN EATS. WE CONCLUDE THAT, EXCEPT FOR THE DESERT, THE TIME-DEPENDENT CONCENTRATION OF TRITIUM IN THE SOIL COMPARTMENT IS PRIMARILY DETERMINED BY THE RAINFALL AFTER THE DEPOSITION, AND IT IS ESSENTIALLY DEPENDENT OF THE ASSUMED COMPARTMENT DEPTH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DEPOSITION + *DOSE + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *CONTAMINATION + PRECIPITATION + SOIL + MODEL TESTING + EQUILIBRIUM + CONCENTRATION + *FOOD CHAIN + *MAN

062726
BALLEREAU P
OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS
COMMISSARIAT A L/ENERGIE ATOMIQUE, BRUYERES-LE-CHATEL (FRANCE)
CEA-RIB-179 +. 65 PAGES, NOVEMBER 1970

TRITIATED WATER IS THE MOST HAZARDOUS SPECIES OF TRITIUM. IN PRESENCE OF AIR, TRITIUM AND ITS COMPOUNDS CAN BE CONVERTED INTO OXIDE BY TWO REACTIONS INDEPENDENT FROM EACH OTHER - (A) SELF-OXIDATION BY THE BETA RADIATION EMITTED, (B) ISOTOPIC EXCHANGE BETWEEN GASEOUS 3H AND THE 1H ATOMS OF WATER VAPOUR. KNOWLEDGE OF CONDITIONS AND RATE CONSTANTS FOR THE CONVERSION OF TRITIUM IN TRITIATED WATER IS NECESSARY FOR THE PROTECTION OF WORKERS IN A TRITIATED ENVIRONMENT. THIS BIBLIOGRAPHY, WHICH PROVIDES A THOROUGH STUDY OF THE UNHAPPILY TOO RARE PUBLISHED MATERIALS, ENABLES TO SHOW THAT THE DATA, PRESENTLY AVAILABLE, ARE INADEQUATE AND THAT FURTHER EXPERIMENTAL WORK MUST BE CARRIED OUT TO CONFIRM THEM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIBLIOGRAPHY + OXIDATION + *ENVIRONMENT + WATER VAPOR

063371
JACOBS DG + STRUXNESS FG + BOWMAN CR
AN ASSESSMENT OF THE RADIOLOGICAL IMPLICATION OF COMMERCIAL UTILIZATION OF NATURAL GAS FROM A NUCLEAR STIMULATED WELL
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
1 PAGE, PG. 44, PAPER ON SYMPOSIUM ON ENGINEERING WITH NUCLEAR EXPLOSIVES, CONF-700101, JANUARY 14-16, 1970

THE EMPHASIS OF THIS PRELIMINARY STUDY IS PLACED ON DETERMINING WHICH OF THE PATHWAYS AND POPULATION GROUPS ARE CRITICAL AND EVALUATING THEIR CONTRIBUTION TO THE DOSE COMMITMENT WHICH WOULD RESULT FROM THE USE OF NATURAL GAS FROM NUCLEAR STIMULATION OF GAS RESERVOIRS.

*DECONTAMINATION + *KRYPTON + PLOWSHARE + *REGULATION + *NUCLEAR DETONATION + POPULATION EXPOSURE + RADIATION SAFETY AND CONTROL + *GAS + *CONSUMER PRODUCT

064035
BROECKER WS + THURBER DL
GEOCHEMICAL STUDIES OF CONTINENTAL WATERS
COLUMBIA UNIVERSITY, PALISADES, NEW YORK
CU-2493-11 +. 282 PAGES, OCTOBER 1970

GEOCHEMICAL STUDIES OF CONTINENTAL WATERS ARE PRESENTED IN SIX APPENDIXES. A SEPARATE ABSTRACT WAS PREPARED FOR EACH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVITY BUILDUP + DILUTION + ELEMENTS AND ISOTOPES + *FALLOUT + *RADIUM + RADON + CHEMICAL KINETICS + *HYDROLOGY + CORRELATION + HYDROLOGY, RATE OF MOVEMENT + *GEOLOGY, GEOCHEMICAL + GAS + *LAKE + *CONCENTRATION

064036
SIMPSON JH
TRITIUM IN CRATER LAKE, OREGON
COLUMBIA UNIVERSITY, PALISADES, NEW YORK
CU-2493-11, APP. 1 +. 39 PAGES, 9 TABLES, 5 FIGURES, OCTOBER 1970

THE TRANSFER OF TRITIUM FROM THE ATMOSPHERE TO THE OCEAN AND TO CONTINENTAL WATER BODIES BY VAPOR EXCHANGE, AS WELL AS BY PRECIPITATION, IS WELL DOCUMENTED. VAPOR EXCHANGE HAS BEEN SUGGESTED AS THE DOMINANT MECHANISM FOR TRANSFER OF TRITIUM TO SMALL CONTINENTAL LAKES. EVIDENCE IS PRESENTED TO SUGGEST THAT INPUT BY PRECIPITATION CAN EXPLAIN MOST OF THE TRITIUM CONTENT OF CRATER LAKE, OREGON. THE HYDROLOGY OF CRATER LAKE MAKES IT IDEAL FOR THIS STUDY SINCE LESS THAN 1/2 OF 1 PERCENT OF THE LAKE VOLUME IS LOST BY SEEPAGE EACH YEAR AND THERE IS NO SURFACE OUTFLOW. DEEP LAKES, WITH SMALL DRAINAGE BASINS CAN PROVIDE GOOD ESTIMATES OF THE TOTAL TRITIUM RAINOUT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DILUTION + OCEAN AND SEA + RAINOUT + *ATMOSPHERIC POLLUTION + HYDROLOGY + *PRECIPITATION + WATER VAPOR + *LAKE + VAPOR EXCHANGE

064776
BARRY PJ
MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (T1643)
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-1624 +. 29 PAGES, OCTOBER 1962

GUIDE FOR REACTOR DESIGNERS, BY ADAPTING ICRP 2 (1959) (MPC)A VALUES TO INFANTS AND CHILDREN AND THE FOOD CHAIN, ASSUMING WHOLE BODY WTS OF 3.7, 8.8, 10 AND 70 KG AT BIRTH, 6 MONTHS, 1 YR, AND FOR ADULTS RESPECTIVELY, MAX PERMISSIBLE DOSE RATES ASSUMED INDEPENDENT OF AGE AND TAKEN AS 10 REMS WHOLE-BODY EXPOSURE FROM MEDICAL RES COUNCIL. VENTILATION RATE 100, 250, 330, 830 LITERS/HR AT BIRTH, 6 MO, 1 YR AND ADULTS RESP, WITH DAILY MILK INTAKE IN CANADA OF 900 ML AT 6 MO. EFF ABSORBED ENERGY FROM ICRP 2 (1959) WITHOUT ALLOWANCE FOR CHANGES IN SIZE OF CRITICAL ORGAN WITH AGE. EFFECTIVE HALF-LIFE AND FRACTIONS REACHING CRITICAL ORGAN ALSO FROM ICRP 2 (1959). COW MILK CONSUMPTION IN CANADA MAX AT 6 MONTHS OF AGE, BUT NOT IN USA. (CF NSIC NOS. 62651, 64699.) MAX PERM SP ACT OF H3 AS OXIDE IN WATER FROM MAX PERM BODY BURDEN AND H2O CONTENT OF STAND MAN IS 2.33 X 10 (EXP -3) UCI H3/GM WATER. MEAN WATER VAPOR CONCN IN AIR OF 8 GM/M3 BETWEEN APR-OCT CORRESPONDS TO MPC OF 2 X 10 (EXP -8) CI/M3 FOR H3 IN AIR OVER AGRICULTURAL LAND. MAX PERM EXPOSURE (MPE) TO HTO VAPOR IN RESPIRABLE AIR AFTER AN ACCIDENT IN CI-SEC/M3 IS 0.1 MASS OF ORGAN/VENTILATION RATE. BODY WATER OF INFANT TAKEN AS 750 GM/KG BODY WT. AT BIRTH, 6 MO, 1 YR, ADULT, RESPECTIVE MPE VALUES ARE 95, 90, 76, 215. RURAL CHILDREN MOST LIKELY TO INGEST MILK OF PURELY LOCAL ORIGIN. PRESENT POLICY IS RURAL SITING OF REACTORS.

AIRBORNE RELEASE + CANADA + CODES AND STANDARDS + MPBB + MPC + OXIDE + *SITING, REACTOR + *MILK + DOSE CALCULATION, INTERNAL + *POPULATION EXPOSURE + ICRP + RADIATION, PUBLIC EDUCATION + *ACCIDENT, DESIGN BASIS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + RESPIRATION + PHYSIOLOGY/METABOLISM + FOOD CHAIN + MAN + NATURE + YOUNG + *INFANT

064781
KIRCHMANN R + VAN DEN HOEK J + LAFONTAINE A
TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES
CENTRE D*ETUDE DE L*ENERGIE NUCLEAIRE, C.E.N., MOL, BELGIUM + LABORATORIUM VOOR FYSIOLOGIE DER DIEREN, WAGENINGEN (THE NETHERLANDS) + INSTITUT L*HYGIEN ET D*EPIDEMIOLOGIE, MINISTERE DE LA SANTE PUBLIQUE, BELGIUM
6 PAGES, 1 FIGURE, 4 TABLES, 9 REFERENCES, HEALTH PHYSICS, VOL. 21, PP. 16-166 (JULY 1971)

NUCLEAR REACTORS GENERATE TRITIUM (MAINLY AS OXIDE) AS WILL NUCLEAR EXCAVATION AND MINING. LAB ANIMAL STUDIES WITH HTO CANNOT BE EXTRAPOLATED RELIABLY TO ENVIRONMENTAL HUMAN POPULATION CONDITIONS INVOLVING ORGANIC TRITIUM. EQUILIBRATION OF TRITIUM IN FORM OF HTO WITH BODY WATER IS RAPID (MINUTES OR HOURS), BUT EQUILIBRATION OF TRITIUM IN FORM OF GRASS WITH ORGANIC CONSTITUENTS OF THE ANIMAL BODY IS SLOW (DAYS), TRITIUM IN THE ORGANIC COMPARTMENTS BEING 10 TIMES HIGHER IN COWS FED TRITIATED GRASS THAN IN COWS FED TRITIATED WATER. GRAZING LAND USED WAS IN DOMAIN OF CENTRE D ETUDE D L ENERGIE NUCLEARE A MOL, THE TRITIUM SOLN (500 LITERS) DISPERSED FROM A JEEP TO GIVE GRASS ACTIVITY OF 450, 180, 230, 17 UCI HTO/M2 IN WINTER, SPRING, SUMMER, AUTUMN RESPECTIVELY, REPRESENTING 375, 250, 250, 300 ML HTO/M2 DEPOSITED. THE COWS (ARDENNAISE AND CAMPIONISE) GAVE ABOUT 12-20 L MILK IN SPRING AND 5-10 L IN AUTUMN. H3 INCORPORATED INTO DRY MATTER OF GRASS WAS 14-19% OF THE FRESH WT. SP ACT OF MILK COMPONENTS IN NCI H3/GM H FOR CASEIN, LACTOSE AND WATER CONTENTS AFTER 7 DAYS OF INGESTION WERE RESPECTIVELY 47, 72, 184, BUILDING UP MORE SLOWLY IN THE ORGANIC COMPONENTS THAN IN THE WATER. SEE ORIGINAL FOR DATA UP TO 28 D. CF

064781 *CONTINUED*
NSIC NOS. 56180, 49713, 49533, 49601, 64768, 64724, 64776.

INGESTION + PLOWSHARE + WATER + BELGIUM + *MILK + MONITOR, ENVIRONMENTAL + POPULATION EXPOSURE + HAZARDS ANALYSIS + REACTOR, LWR + ECOSYSTEM, GRASSLAND + *CONSUMER PRODUCT + *RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *FOOD CHAIN + SPECIFIC ACTIVITY + TURNOVER RATE + PRODUCTION, RATE + EXPOSURE, CHRONIC + PROTEIN + FOOD INTAKE + *ORGANIC + MAMMAL, COW

064789
KORANDA JJ
PRELIM STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC PROVING GROUND
BIO-MEDICAL DIVISION, LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
13 PAGES, 1 FIGURE, 9 TABLES, 12 REFERENCES, HEALTH PHYSICS, VOL. 11, PP. 1445-1457 (1965)(T1782)

CF NSIC NO. 64786. SURVEY TO SEE OF H3 AND C14 WERE PRESENT IN ENIWETOK ENVIRONMENT 12 YR POST-DETONATION WAS POSITIVE, ENIWETOK ATOLL, MARSHALL ISLANDS, HAVING BEEN PROVING GROUND FOR NUCLEAR TESTING BETWEEN 1948-1958. CRABS, CLAMS, FISH, NUTS, VEGETATION, SOIL, SEAWTAER, RAINWATER SHOWED RESIDUAL H3 AND C14. AUG 1964 RAINWATER CONTAINED 86 +-3 TRITIUM UNITS (TU) WHERE 1 TU IS 1 ATOM OF H3/10 (EXP +18) ATOMS OF HYDROGEN. LAGOON SEAWATER INCREASED FROM 60 OR LESS AT 10 FEET BELOW SURFACE TO 840 AT 1 METER FROM THE BOTTOM OF MIKE CRATER. PACIFIC OCEAN SEAWATER WAS 8. BOUND WATER IS COCONUT CRAB WAS 95 OR LESS, LOOSE WATER 81 +-30, WHILE IN HERMIT CRAB RESPECTIVE VALUES WERE 270 +-30 AND 60 OR LESS. SURGEONFISH AT RUNIT ISLAND REEF GAVE 400 +-80 AND 39 OR LESS, WHILE SURGEONFISH AT SANILDEFONSO ISLAND, MIKE CRATER, GAVE 90 +-33 AND 60 OR LESS. INNER GROWTH RINGS OF MESSERSCHMIDIA ARGENTEA GAVE 59 +-4, OUTERGROWTH RINGS 78 +-5, THE LEAVES 175 +-6, THE LITTER 204 +-7 AND THE SOIL 2920 +-65. THE SOIL OF ENIWETOK IS COMPOSED ALMOST ENTIRELY OF CORAL FRAGMENTS AND DEBRIS (CACO3 +CA(OH)2). LOOSE WATER OF THE MESSERSCHMIDIA WOOD CONTAINED 3230 TU AT CACTUS CRATER, THE SOIL BENEATH CONTAINING 509 TU, WHILE THE LEAVES CONTAINED 442 TU IN LOOSE WATER, WOIL WATER H3 BEING 509 TU. TISSUE ENRICHMENT OF BOUND C14 WAS HIGHEST IN FISH.

CARBON + FALLOUT + SURVEY, ENVIRONMENT + TESTING + *POPULATION EXPOSURE + MONITOR, NUCLEAR DETONATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + ANIMAL, FISH + BIOMASS + PHYSIOLOGY/METABOLISM + *CONCENTRATION + RADIATION EFFECT, ECOSYSTEM + COMMUNITY, PLANT + DURATION, GENERATION + OCEAN, PACIFIC + FOOD INTAKE + EXPOSURE, BACKGROUND + YEAR

065087
VAUGHAN BE
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-1550 VOL. 2, PT. 2 +. 108 PAGES, MARCH 1971

62 RESEARCH TOPICS ARE REPORTED. A SMALL BUT IMPORTANT PART OF THE TOTAL EFFORT IS IN PROGRAMS CONCERNED WITH THE ARID LANDS ECOLOGY RESERVE (FOR WHICH THE LONG RANGE OBJECTIVE IS TO STUDY THE EFFECT OF ENVIRONMENTAL MODIFICATIONS BY WILDFIRE, IRRIGATION, GRAZING, HERBICIDAL APPLICATIONS, ETC.). EFFORTS ARE DESCRIBED TO PERMIT CONSERVATION-ORIENTED GROUPS TO GAIN A BETTER UNDERSTANDING OF AECS LONG INTEREST AND SUPPORT IN ECOLOGY. SEVERAL ELEMENTS OF THE SIMULATION OF THE LICHEN-CARIBOU-ESKIMO FOOD CHAIN ARE BEING REFINED. EFFORTS ARE CONTINUING IN REACTOR SITING PROBLEMS INCLUDING INJURY TO FISH BOTH FROM THERMAL EFFECTS AND FROM POTENTIAL HAZARDS ASSOCIATED WITH CHRONIC RADIOACTIVITY DISCHARGE. LONG-TERM STUDIES OF CANADA GOOSE POPULATIONS ON THE COLUMBIA RIVER ARE REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + FIRE + WASTE DISPOSAL + ZINC + RIVER, COLUMBIA + *BATTELLE NORTHWEST + ECOSYSTEM, GRASSLAND + DESTRUCTIVE WIND + SOIL PROPERTY, IN SITU + THERMAL POLLUTION + *RADIONUCLIDE UPTAKE + ECOSYSTEM, AQUATIC + FOOD CHAIN + ECOSYSTEM + RADIATION EFFECT + ECOSYSTEM, ARCTIC + ECOSYSTEM, DESERT + *RESEARCH, GOVERNMENT + PLANT, SEEDLING

065107
THOMPSON JC
FALLOUT STUDIES AND THEIR RELATIONSHIP TO THE GENERAL PROBLEM OF ENVIRONMENTAL RADIOCONTAMINATION
DEPARTMENT OF PHYSICAL BIOLOGY, NEW YORK STATE VETERINARY COLLEGE, CORNELL UNIV. ITHACA, NEW YORK
NYO-4039-1 +. 162 PAGES, 1969

HIGHER RADIOCESIUM WAS FOUND IN BOTTOM SEDIMENT (2400 PICOCURIES/KILOGRAM) THAN IN SHALLOW REGIONS WHERE THE LEVEL WAS THAT OF TERRESTRIAL SOIL (700-900 PCI/KG). RADIOSTRONTIUM IN FISH FLESH (2-60 PCI/KG) WAS LESS THAN RADIOCESIUM (13-260 PCI/KG). THE RATIO OF RADIOSTRONTIUM TO CALCIUM DID NOT DIFFER MUCH BETWEEN FISH FLESH AND BONE. THE HIGHER PROPORTION OF MUSCLE IN LARGE FISH CAUSED A HIGHER RADIOCESIUM CONTENT (140-170 PCI/KG) AS COMPARED WITH SMALL FISH (20-70 PCI/KG). THE K-40 LEVEL WAS 10,000 PCI/KG IN SEDIMENT AND SOIL, 3000-4500 PCI/KG IN FISH, 1700-5400 PCI/KG IN VEGETATION, AND 1000 PCI/KG IN WATER. CONCENTRATION FACTORS OF FISH WERE 2800-4100 FOR K-40, 700-3300 FOR CS-137, 2-40 FOR SR-90 IN FLESH, AND 190-340 FOR SR-90 IN BONE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + FALLOUT + SITING + STRONTIUM + POTASSIUM + SOIL, NUCLIDE OCCURRENCE + RADIONUCLIDE UPTAKE + *ANIMAL, FISH + *ECOSYSTEM, AQUATIC + SEDIMENT + *LAKE CAYUGA

065109
BOLCH WE
AN ECOLOGICAL APPROACH TO ENVIRONMENTAL SURVEILLANCE
FLORIDA UNIVERSITY, GAINSVILLE
CONF-701106 +. 13 PAGES, PG. 252-265, 8 FIGURES, 7 REFERENCES, PROCEEDINGS OF THE FIFTH ANNUAL HEALTH PHYSICS SOCIETY MIDYEAR TOPICAL SYMPOSIUM, HEALTH PHYSICS ASPECTS OF NUCLEAR FACILITY SITING, VOL. 2, NOVEMBER 3-6, 1970

MARINE, MARSHLAND, AND TERRESTRIAL ECOSYSTEMS NEAR THE CRYSTAL RIVER NUCLEAR PLANT WILL BE WELL-STUDIED BY THE TIME THE PLANT GOES OPERATIONAL. A FINAL OBJECTIVE IS TO PROVIDE RECOMMENDATIONS TO MINIMIZE ENVIRONMENTAL DEGRADATION IN THE DESIGN AND OPERATION OF POWER PLANTS. SAMPLING IN THE MARINE ENVIRONMENT (WATER, SEDIMENT, PLANKTON, ALGAE, GRASSES, OYSTERS, SHRIMP, CRABS, PINFISH) INCLUDED THREE AREAS DESIGNATED BY THEIR NEARNESS TO THE DISCHARGE CANAL AND BE REASON OF THE DIRECTION OF FLOW OF THE GULF. THE GAMMA SCANS, FOOD WEBS, AND OTHER ENVIRONMENTAL STRESSES (OXYGEN CONTENT, SALINITY, HEALTH OF ORGANISMS) WERE STUDIED.

AVAILABILITY - BURTON R. BALDWIN, PUBLICATIONS CHAIRMAN, P. O. BOX 2431, IDAHO FALLS, IDAHO 83401

CESIUM + FALLOUT + OXYGEN + STRONTIUM + SURVEY, ENVIRONMENT + WASTE DISPOSAL, OCEAN + SAMPLING + MONITOR, ENVIRONMENTAL + SURFACE WATER, SEDIMENT + SPECTROMETRY, GAMMA + *CRYSTAL RIVER 3 (PWR) + SURVEILLANCE PROGRAM + ENVIRONMENTAL CONTROL MEASURE + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + PHYTOPLANKTON + BIOACCUMULATION/TURNOVER + FOOD CHAIN + PLANT, SPERMATOPHYTE + ECOSYSTEM + PLANT, ALGAE/FUNGI + *ECOSYSTEM, MARINE + MOLLUSC + ECOSYSTEM, ESTUARINE + SALINITY

065163
KIRCHMANN R + VANDENHOEK J + LAFONTAINE A
TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS
5 PAGES, HEALTH PHYSICS, 21(2), PAGE 61-66, (JULY 1971)

CONTAMINATION OF GRAZING LAND BY THE DEPOSITION OF TRITIATED WATER HAS MADE IT POSSIBLE TO CALCULATE THE LEVEL OF INCORPORATION OF TIRITUM INTO THE GRASS AND TO FOLLOW THE PATTERN OF CONTAMINATION AFTER DEPOSITION OF DIFFERENT SEASONS. IT WAS ALSO POSSIBLE TO DETERMINE THE LEVEL AND RATE OF TRANSFER AND THENCE THE DISTRIBUTION OF TRITIUM IN THE MILK PRODUCED BY COWS EATING THE CONTAMINATED GRASS. THESE DATA ARE COMPARED WITH THOSE OBTAINED FOR THE CONTAMINATION OF MILK RESULTING FROM THE REPATED INGESTION OF TRITIATED WATER. IT APPEARS THAT THE TRITIUM IN THE ORGANIC MATERIAL IS 10 TIMES HIGHER IN THE CASE OF COWS FED WITH CONTAMINATED GRASS THAN FOR COWS DRINKING TRITIATED WATER.

*INGESTION + *WATER + *MILK + CONTAMINATION + *ECOSYSTEM, GRASSLAND + *CONCENTRATION + RADIONUCLIDE TRANSFER + COMPARISON + ORGANIC + *MAMMAL, COW + PLACENTAL TRANSFER

065420
SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC
70 PAGES, FIGURES, TABLES, HEARINGS BEFORE JCAE CONF. ON ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER, (OCTOBER 30, 1969)

A COMPREHENSIVE SUMMARY OF THE ACTIVITIES OF THE AEC IN ENVIRONMENTAL STUDIES IS PRESENTED BY THE SPEAKER. CONCERNING SOMATIC EFFECTS, HE REMARKS THAT AT PRESENT, IT IS NOT CLEAR WHETHER SOME OBSERVED LATE EFFECTS OF RADIATION HAVE A THRESHOLD DOSE FOR PRODUCTION. HE DETAILS SOMATIC AND GENETIC EFFECTS, DROSOPHILA AND MOUSE EXPERIMENTS, TRITIUM AND KRYPTON BIOLOGICAL-HALF-LIVES, NATURAL PRODUCTION AND CONCENTRATION OF FORMER, DNA MECHANISM, AND HUMAN EXPOSURE TO BOTH GASES. RADIOACTIVE-EFFLUENT-CONTROL RESEARCH AND DEVELOPMENT ARE REVIEWED. THESE INCLUDE DESCRIPTIONS OF THE MANY PROCESSES EXAMINED AND USED IN RECOVERING AND TREATING NUCLIDES FROM PROCESSING WASTE STREAMS. RADIOACTIVE GAS CONTROL MEASURES ARE ALSO COVERED. THE FATE OF HEAVY-METAL NUCLIDIC DISCHARGES INTO STREAMS IS COVERED, AS ARE THE VARIOUS METHODS OF DISPOSING OF THE WASTES BY SUCH METHODS AS HYDRAULIC FRACTURING -- AND DISPOSAL OF RADIOACTIVE GASES INTO POROLS AND UNDERGROUND FORMATIONS. OTHER TOPICS EVALUATED AND DISCUSSED IN DETAIL CONCERN METEOROLOGICL AND THERMAL EFFECTS STUDIES.

CESIUM + COBALT + FISSION PRODUCT RELEASE + GEOLOGY + RUTHENIUM + STRONTIUM + ZINC + POPULATION EXPOSURE + WASTE MANAGEMENT + HYDROLOGY + *RADIATION SAFETY AND CONTROL + RADIOACTIVITY RELEASE + METEOROLOGY + THERMAL POLLUTION + CALVERT CLIFFS 1 (PWR) + DATA COLLECTION + EFFECT, GENETIC + EFFECT, SOMATIC + RADIATION EFFECT + AGENCY, AEC + CHESAPEAKE BAY + *N-POWER, SAFETY OF + *SPOKESMAN, AEC

066272
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-3961 +. 49 PAGES, 1971

INCLUDES A 600-WORD TOPICAL SUMMARY ON GENETIC EFFECTS AT LOW DOSES. 200-300 WORD SUMMARIES ON PROJECTS IN THE SECTIONS, BIOLOGY (BIOCHEMISTRY AND MOLECULAR BIOLOGY, GENETICS AND POPULATIONS), AND POPULATION RESEARCH (HEREDITARY CHANGES IN VERTEBRATES, SOMATIC, AND GENETIC HARM IN HUMAN POPULATIONS). 50-150 WORD SUMMARIES IN THE SECTIONS, ENVIRONMENTAL RESEARCH (OFF-SITE AND EFFLUENT MONITORING, RADIOECOLOGY, PRODUCTIVITY STUDIES BY THE C-14 TECHNIQUE, RADIATION PROCESSING OF WASTE WATER, LOW LEVEL COUNTING) AND HEALTH PHYSICS (PLASTIC FILM-FISSION FRAGMENT NEUTRON DOSIMETRY, NAI DETECTOR EFFICIENCY, THERMOLUMINESCENCE DOSIMETRY, TRITIUM MONITORING, RADIATION INSTRUMENT DEVELOPMENTS).

*BIOMEDICAL + DOSIMETRY + EFFLUENT + STRONTIUM + WASTE TREATMENT + XENON + DOSIMETRY, THERMOLUMINESCENCE + POPULATION EXPOSURE + CHALK RIVER + MONITORING PROGRAM, ENVIRONMENTAL + PLASTICS + LAKE + *RADIONUCLIDE

066277 *CONTINUED*
UPTAKE + ANIMAL, FISH + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + PHYSIOLOGY/METABOLISM + EFFECT, GENETIC + EFFECT, SOMATIC + *RADIATION EXPOSURE, CHRONIC + TRACE ELEMENT + MAN + RADIATION MONITORS

067088
OSBORNE RV
PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER LABORATORIES
15 PAGES, RADIATION RESEARCH, VOL. 50, PP. 197-211 (1972)

THE BENEFIT OF PRODUCING 1 GRAM-MICROLAMBERT HAS A RISK OF 0.16 MILLIREM ACCORDING TO ONE TRITIUM LUMINOUS PAINT PLANT STUDY (NSIC NO. 64780), EMPLOYEES AVERAGING 20 UCI/L IN URINE. WORKERS AT ONE PLANT REACHED ONE MAX-PERMISSIBLE BODY BURDEN WITHIN A FEW WEEKS (NSIC NO. 64784), NAMELY 2000 UCI, ASSUMING ALL BODY TRITIUM IN HTO FORM AND ASSUMPTION WHICH HAS BEEN QUESTIONED (NSIC NO. 64764). FOR ADDNL ASSUMPTIONS ABOUT TRITIUM EXPOSURE IN MAN SEE NSIC NOS. 64778, 64777,64775,64776, 64773. URINARY TRITIUM OF PERSONS WEARING TRITIUM-ACTIVATED LUMINOUS-DIAL WRIST WATCHES MAY AVERAGE 3 NCI/L AS AGAINST 0.7 +-0.2 FOR THOSE WHO DO NOT (NSIC NO. 67089). -- PURPOSE OF PRESENT REVIEW BY OSBORNE WAS TO RELATE TRITIUM LEVELS IN MAN AND HIS ENVIRONMENT TO A DOSE EQUIVALENT FOR MAN. ABOUT 40% OF A PERSON'S WATER THROUGHPUT IS TAKEN IN AS DRINKING WATER (FOOD WATER EXCLUDED), HENCE H3 CONCN IN BODY WATER TAKEN TO BE 40% OF THAT INGESTED. HIGHEST WATER CONCN OF 80% IS IN GONADS OR 32% OF INGESTED WATER. ASSUME GONADS 100% WATER, THEN AT BODY WATER H3 OF 69 UCI OR 1.6 UCI/KG. DOSE-EQUIV RATE IS 170 MREM/YR TO GONADS, THE AVERAGE POPULATION DOSE-RATE LIMIT RECOMMENDED BY NCRP 39 (1971). USING ICRP 2 (1959) AND ICRP 10 (1968)(NSIC NO. 64775) ASSUMPTIONS, OSBORNE ESTIMATES A CHRONICALLY MAINTAINED BODY BURDEN OF 91 UCI OF H3 AS AGAINST 69 BY ICRP TO DELIVER 170 MREM/YR WHEN INGESTED WATER CONTAINS 4.7 UCI/KG AS AGAINST 1.6, OR CORRESPONDING AIR CONCNS AT 0.16 AND 0.09 UCI/M3 RESPECTIVELY.

BIBLIOGRAPHY + HYDROGEN + INGESTION + INHALATION + *MPBB + MPC + OXIDE + HAZARD, RELATIVE + WATER + AIR + DOSE CALCULATION, INTERNAL + WATER, DRINKING + POPULATION EXPOSURE + ICRP + NCRP + PERSONNEL EXPOSURE, RADIATION + ENVIRONMENT + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + EFFECT, GENETIC + DNA + MODEL, BIOLOGICAL + EXPOSURE, ACUTE + EXPOSURE, CHRONIC + MAN + MATURE + BENEFIT VS RISK + BODY FLUID

067891
FOLSOM TR
NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS
SCRIPPS INSTITUTION OF OCEANOGRAPHY, LA JOLLA, CALIFORNIA
TID-25774 +. 16 PAGES, MARCH 15, 1971

GIVES AN EXAMPLE OF THE LIMITED AND SOMEWHAT BIASED INFORMATION THAT HAS BEEN PRESENTED TO A WATER-QUALITY-CONTROL BOARD BY A TYPICAL INVESTOR-OWNED POWER COMPANY. PRESENT REGULATIONS MAKE IT NECESSARY ONLY TO MONITOR CRUDELY THE ACTIVITY DISCHARGED--SUFFICIENT TO AVOID EXCEEDING STANDARDS, HARDLY APPROPRIATE FOR DESCRIBING ENVIRONMENTAL DAMAGE. A BETTER INSPECTION SHOWS THAT AT LEAST ONE NUCLIDE HAS ACCUMULATED IN AT LEAST TWO SPECIES. A SIMPLE CALCULATION SUGGESTS THAT THE MUCH LARGER AMOUNTS OF TRITIUM COMING FROM THIS PLANT PROBABLY HAS ALREADY ALTERED LARGE AREAS OF THE COASTAL OCEAN MEASURABLY. IN FACT, THIS RADIOACTIVE TAG MIGHT BE USEFUL TO INDICATE HOW THE OCEAN DISPOSES OF OTHER COASTAL POLLUTIONS. THESE ACTIVITIES CERTAINLY MUST NOW BE TAKEN INTO CONSIDERATION AS BACKGROUNDS--BY SCIENTISTS AT LEAST.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*CODES AND STANDARDS + *EFFLUENT + REACTOR, PWR + *WASTE DISPOSAL, OCEAN + *SAN ONOFRE 1 (PWR) + MONITOR, ENVIRONMENTAL + *REGULATION, AEC + REACTOR POWER + RADIOACTIVITY RELEASE + RADIOISOTOPE + *SURVEILLANCE PROGRAM + REGULATION, FEDERAL + CONCENTRATION + OCEAN, PACIFIC

068114
SMITH DB + RICHARDS HJ
SELECTED ENVIRONMENTAL STUDIES USING RADIOACTIVE ISOTOPES
U. K. ATOMIC ENERGY AUTHORITY, HARWELL + WATER RESOURCES BOARD, READING, BERKSHIRE
A/CONF.49/P-509 + CONF-710901-227 +. 13 PAGES, FROM 4TH INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, SWITZERLAND, SEPTEMBER 6, 1971

WATER MOVEMENT IN UNSATURATED STRATA WAS TRACED BY TRITIUM INFILTRATION FROM THERMONUCLEAR TESTING (SOMETIMES IN CONJUNCTION WITH THE INJECTION OF ADDITIONAL TRITIUM). THE RATE OF RECHARGE OF AQUIFERS WAS DETERMINED SIMILARLY. TRACERS USED FOR COASTAL SILTATION STUDIES WERE - THE SODIUM IN NATURAL SILT WHICH WAS MADE RADIOACTIVE BY IRRADIATION WITH THERMAL NEUTRONS, SC-46 WHICH WAS ADSORBED ON THE SILT, AND A GLASS CONTAINING 2.4% SCANDIUM OXIDE WHICH WAS ADDED IN VARIOUS SIZE DISTRIBUTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FALLOUT + SODIUM + *TRACER, RADIOACTIVE + UNITED KINGDOM + SURFACE WATER, NUCLIDE OCCURRENCE + GROUND WATER, NUCLIDE OCCURRENCE + GROUND WATER, TRACER + SCANDIUM + *RADIONUCLIDE TRANSFER + *SEDIMENT

068583
ESSIG TH
RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1970
BATTELLE NORTHWEST LABORAOTYR, RICHLAND, WASHINGTON
BNWL-1613 +. 25 PAGES, SEPTEMBER 1971

068583 *CONTINUED*
AN EVALUATION OF RU-RH-106 AND H-3 CONCENTRATIONS MEASURED IN THE UNCONFINED GROUNDWATER DURING THE SECOND HALF OF 1970 SHOWS THAT THE ZONES OF DETECTABLE CONTAMINATION EXTEND IN AN EASTERLY TO SOUTHEASTERLY DIRECTION FROM 200-E AREA, AS OBSERVED IN THE PAST. FOR THE FIRST TIME, H-3 CONCENTRATIONS WERE MEASURED OVER A GEOGRAPHICALLY EXTENSIVE AREA IN THE VICINITY OF THE 100 AREAS. THE FEW LOCATIONS FOR WHICH AVERAGE GROUNDWATER CONCENTRATIONS EXCEEDED THE CONCENTRATION GUIDE (CG) FOR RU-106 WERE ALL WITHIN EITHER 200-E OR 200-W AREAS. WATER FROM ONLY ONE 600 AREA WELL LOCATED OUTSIDE LIMITED AREA FENCES (WELL-699-35-70) INDICATED A H-3 CONCENTRATION GREATER THAN THE CONCENTRATION GUIDE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*MONITOR, LIQUID + RUTHENIUM + SOIL, RADIONUCLIDE MOVEMENT THROUGH + *GROUND WATER, NUCLIDE OCCURRENCE + RADIOLOGICAL ASSISTANCE + *HANFORD SITE + SAFETY EVALUATION + *SURVEILLANCE PROGRAM + MONITOR, AREA + *CONCENTRATION + TRANSPORT

068619
GARNER RJ + COMAR CL
TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO ANIMALS AND MAN
COLORADO STATE UNIVERSITY, FORT COLLINS + CORNELL UNIVERSITY, ITHACA, NEW YORK
49 PAGES, CRITICAL REVIEWS IN ENVIRONMENTAL CONTROL, 2(3), PP. 337-385 (1971)

LITERATURE ON PATHWAYS OF RADIONUCLIDES TO THE BIOSPHERE IS REVIEWED SINCE PUBLICATION OF RADIOACTIVITY AND HUMAN DIET (R.S. RUSSELL, ED., 1966). I-131, SR-90, CS-137, OTHER MAN-MADE RADIONUCLIDES, AND NATURAL RADIONUCLIDES OF THE URANIUM AND THORIUM SERIES ARE DEALT WITH. A FIELD STUDY IS REQUIRED FOR AN ACCURATE ESTIMATE OF THE CONSEQUENCES OF ANY SPECIFIC CONTAMINATION EVENT. DOSE ESTIMATES (MREM/YR) ARE - AVERAGE TO THE WHOLE BODY FROM NATURAL SOURCES (79), INTERNAL FROM K-40 (20), INTERNAL FOR REINDEER-HERDING LAPPS FROM PO-210 (100), TO THE WHOLE BODY FROM THE NUCLEAR POWER PROGRAM BY THE YEAR 2000 FROM TRITIUM (0.06) AND FROM KR-85 (0.025).

BIBLIOGRAPHY + INGESTION + RADIATION IN PERSPECTIVE + HAZARD, RELATIVE + XENON + DIETARY HABIT + *DOSE CALCULATION, INTERNAL + CRITICAL NUCLIDE PATHWAY + *DOSE CALCULATION, EXTERNAL + RADIOACTIVITY RELEASE + RADIOISOTOPE + REVIEW + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + FOOD CHAIN + ECOSYSTEM, MODEL + MAN + WHOLE BODY

068694
ANSPAUGH LR + KORANDA JJ + ROBINSON WL
ENVIRONMENTAL ASPECTS OF NATURAL GAS STIMULATION EXPERIMENTS WITH NUCLEAR DEVICES
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-73429 + CONF-710501-39 + PNE-R-53 +. 77 PAGES, FROM 3RD NATIONAL SYMPOSIUM ON RADIOECOLOGY, OAK RIDGE, TENNESSEE, MAY 10, 1971

SUCCESSFUL DEVELOPMENT OF THIS TECHNOLOGY COULD DOUBLE THE PROVED RECOVERABLE NATURAL GAS IN THE UNITED STATES. DATA OBTAINED DURING THE PROJECT RULISON TEST IS USED TO PREDICT THE DOSE TO MAN FROM TRITIATED WATER VIA THE FORAGE-COW-MILK, FORAGE-CATTLE-BEEF, VEGETATION, AND INHALATION PATHWAYS. THE UPPER LIMIT OF THE DOSE PREDICTED FOR RULISON-AREA RESIDENTS (3 X 10(-6TH) REM) IS 0.001 TO 0.0001 LOWER THAN EARLIER ESTIMATES. THE DOSE VIA ALL PATHWAYS PREDICTED FOR A FIELD OF NUCLEAR-STIMULATED NATURAL GAS WELLS SUPPLYING A 1000-MWE POWER STATION WOULD BE AN ORDER OF MAGNITUDE LOWER THAN THE DOSE VIA INHALATION ALONE IF THE SAME NATURAL GAS WERE TO REPLACE THE NATURAL GAS SUPPLY DELIVERED TO THE LOS ANGELES BASIN OR SAN FRANCISCO BAY AREA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

INGESTION + INHALATION + *PLOWSHARE + *DOSE CALCULATION, INTERNAL + *CRITICAL NUCLIDE PATHWAY + GAS + STIMULATION + RESOURCE, NATURAL

069036
VOLCHOK HL + BOWEN VT + FOLSOM TR + BROECKER EA + SCHUERT EA + BIEN GS
OCEANIC DISTRIBUTION OF RADIONUCLIDES FROM NUCLEAR EXPLOSIONS
48 PAGES, 5 FIGURES, 21 TABLES, 360 REFERENCES, PP. 42-89 (CHAPTER 3) OF RADIOACTIVITY IN THE MARINE ENVIRONMENT, WASHINGTON, D.C., NATIONAL ACADEMY OF SCIENCES, 1971

THE RATIO SR-90/CS-137 AVERAGES ABOUT 1.5 IN THE OCEANS AND IS INDEPENDENT OF DEPTH. SR-90 DECREASES WITH DEPTH, EXCEEDING 10% OF THE SURFACE VALUE AT 700 M. THREE DIFFERENT INTERPRETATIONS CONCERNING THE DEEP-WATER CONCENTRATION ARE GIVEN. MOST OF THE CONCENTRATIONS OBSERVED IN DEEP WATER APPEAR EXCESSIVE, SINCE THEY WOULD INDICATE TOO LARGE A VALUE FOR THE WORLD INVENTORY. IN THE EASTERN EQUATORIAL ATLANTIC, THE THERMOCLINE APPEARS TO INSULATE THE DEEPER LAYERS FROM TRITIUM PENETRATION, BUT IN OTHER AREAS THERE IS PENETRATION TO 2000 M. DATA FOR RADIOCARBON IN THE EASTERN PACIFIC SUGGESTS A RELATIONSHIP BETWEEN WEATHER AND MIXING. THE LANTHANIDES, AS WELL AS ZR AND NB, ARE LARGELY ASSOCIATED WITH PARTICLES AND EXHIBIT SIMILAR PROFILES WITH DEPTH.

AVAILABILITY - PRINTING AND PUBLISHING OFFICE, NATIONAL ACADEMY OF SCIENCES, WASHINGTON, D.C.

CESIUM + *FALLOUT + NIOBIUM + *OCEAN AND SEA + STRONTIUM + WASTE DISPOSAL, OCEAN + ZIRCONIUM + SURFACE WATER, NUCLIDE OCCURRENCE + MIXING DEPTH + CRITICAL NUCLIDE PATHWAY + LANTHANUM + METEOROLOGY + REVIEW + *RADIONUCLIDE TRANSFER

069396
CLEGG B + KORANDA J + HADLEY G
A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL VARIABLES
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-73373 + CONF-711111-20 +. 6 PAGES, 4 FIGURES, 7 REFERENCES, PAPER PRESENTED AT THE IEEE 1972 NUCLEAR SCIENCE SYMPOSIUM, SAN FRANCISCO, CALIFORNIA, NOVEMBER 3-5, 1971

LIKELY INCREASES OF ATOMIC POWER PRODUCTION WILL RESULT IN RELEASES OF MORE TRITIUM (3H) TO THE ENVIRONMENT. THIS LOW ENERGY BETA EMITTER HAVING A HALF-LIFE OF 12.4 YEARS IS AN INTERNAL BIOLOGICAL HAZARD. IN THE MOST COMMON BIOLOGICALLY IMPORTANT FORM OF TRITIATED WATER (THO), TRITIUM MOVES THROUGH THE BIOSPHERE ESSENTIALLY ALONG WATER PATHWAYS. KNOWLEDGE OF THESE PATHWAYS IN THE PREDICTABLE TERMS OF ENVIRONMENTAL CONDITIONS IS REQUIRED FOR CALCULATING THE RADIOLOGICAL HAZARD TO MAN. THE STUDY OF TRITIUM IN THE BIOSHPERE IS THEN ACTUALLY THE STUDY OF THE PROPERTIES OF WATER TRANSPORT THROUGH THE AIR-WATER, SOIL, PLANT INTERFACES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HAZARD, RELATIVE + TRACER, RADIOACTIVE + *ATMOSPHERIC POLLUTION + WATER + BETA EMITTER + *DOSE CALCULATION, EXTERNAL + *RADIATION SAFETY AND CONTROL + SOIL + RADIOACTIVITY RELEASE + *ENVIRONMENT + *VEGETATION + ECOSYSTEM, TROPICAL + *TRANSPORT + BIOLOGICAL CONTROL + TRANSPIRATION

069508
KORANDA JJ + MARTIN JR
MOVEMENT OF TRITIUM IN ECOLOGICAL SYSTEMS
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-73178 +. 56 PAGES, 16 FIGURES, 4 TABLES, 34 REFERENCES, AUGUST 24, 1971

THE WORLD-WIDE EXPOSURE FROM FISSION-PRODUCED TRITIUM BY THE YEAR 2000 (0.008 MILLIRAD) WILL BE SMALL. LOCAL EXPOSURES MAY BE SUBSTANTIALLY HIGHER, DEPENDING ON HOLDUP IN ECOSYSTEMS. TURNOVER OF TRITIATED WATER IN PLANTS, ANIMALS, AND ECOSYSTEMS IS REVIEWED. IMPORTANT FACTORS INCLUDE RATES OF TURNOVER OF SOIL WATER, HALF TIMES OF BODY OR TISSUE WATER (MINUTES-HOURS IN PLANTS, 1-15 DAYS IN ANIMALS), AND RATES OF ORGANIC FIXATION OF TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DILUTION + FALLOUT + *DOSE CALCULATION, INTERNAL + GROUND WATER, NUCLIDE OCCURRENCE + SOIL, NUCLIDE OCCURRENCE + SURFACE WATER, DISPOSAL MEDIA + WASTE DISPOSAL, LIQUID + CRITICAL NUCLIDE PATHWAY + *REVIEW + ENVIRONMENTAL CONTROL MEASURE + RADIONUCLIDE-UPTAKE + ANIMAL + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + VEGETATION + RADIONUCLIDE TRANSFER + *ECOSYSTEM + ORGANIC

070396
ANSPAUGH LR + KORANDA JJ + ROBISON WL + MARTIN JR
DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-73195 + CONF-71809-12 +. 31 PAGES, FROM THE TRITIUM SYMPOSIUM HELD IN LAS VEGAS, NEVADA, AUGUST 30, 1971

PAST EFFORTS TO PREDICT THE DOSE TO MAN AS A RESULT OF POSSIBLE FOOD-CHAIN CONTAMINATION FOLLOWING THE RELEASE OF THO VAPOR HAVE BEEN BASED UPON MODELS MORE APPROPRIATE FOR THE RELEASE OF RADIONUCLIDES WHICH DIFFER SUBSTANTIALLY FROM THO IN THE DYNAMICS AND PATHWAYS OF ECOLOGICAL TRANSPORT. FIELD STUDIES IN CONJUNCTION WITH PROJECT RULISON AND CONTROLLED EXPOSURE EXPERIMENTS INDICATE THAT SUCH MODELS OVERPREDICT THE DOSE TO MAN BY ORDERS OF MAGNITUDE. DATA FROM THESE AND OTHER PERTINENT EXPERIMENTS ARE USED TO DERIVE A MORE REALISTIC, SIMPLE MODEL WHICH MAY BE USED TO PREDICT THE DOSE TO MAN VIA INHALATION PLUS ABSORPTION AND VIA THE INGESTION OF VEGETABLES, MILK, AND MEAT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECOLOGY + DOSE + INGESTION + INHALATION + *MILK + CRITICAL NUCLIDE + *CRITICAL NUCLIDE PATHWAY + *WATER VAPOR + ABSORPTION + MODEL + CONCENTRATION + *FOOD CHAIN + *RADIATION EXPOSURE, ACUTE + *RADIATION EXPOSURE, CHRONIC + FOOD

072235
HAWSON CA
CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, OCT. 1 TO DEC 31, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENT RESEARCH BRANCH
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER LABORATORIES
AECL-4154 + PR-B-92 +. PG. 57-79, MARCH 1972

THE SPECIFIC ACTIVITY OF SR-90 IN THE UPPER 10 CM OF LAKE SEDIMENTS INDICATED INCOMPLETE EXCHANGE WITH THE WATER AFTER 15 YEARS OF EXPOSURE. ABOUT 30% OF THE CO-60 ENTERING THE LAKE WAS RETAINED IN THE UPPER FEW CM OF SEDIMENTS. TO CORRELATE SEDIMENTATION RATES WITH RADIONUCLIDE PROFILES, ANALYTIC SEPARATIONS WERE DEVELOPED FOR ZR, TH, AND CE; BUT MORE WORK IS REQUIRED FOR SR. UPTAKE OF CO-60 BY CROPS WAS RELATIVELY LOW FOR PEAT AND ORGANIC-SLUDGE SOILS (CONTRASTING WITH CS UPTAKE). UPTAKE BY AQUATIC LIFE WAS AFFECTED BY MORPHOLOGY, WATER CURRENTS, AND FISH FEEDING HABITS. SR DISCRIMINATION VARIED BETWEEN FISH SPECIES, WAS ALMOST UNAFFECTED BY ENVIRONMENTAL FACTORS, AND WAS LESS FOR UPTAKE VIA THE GUT THAN VIA THE GILLS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVATION + COBALT + SOIL, RADIONUCLIDE MOVEMENT THROUGH + STRONTIUM + SURVEY, ENVIRONMENT + RIVER, OTTAWA +

072235 *CONTINUED*
ANALYTICAL TECHNIQUE + *CHALK RIVER + SOIL PROPERTY + ENVIRONMENT + LAKE + *RADIONUCLIDE UPTAKE + *ANIMAL, FISH + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + PHYSIOLOGY/METABOLISM + VEGETATION + AQUATIC ORGANISM + *SEDIMENT + FIELD EXPERIMENT + SPECIFIC ACTIVITY + CONCENTRATION FACTOR

072304
CROUZET E + HUBERT P + OLIVE P + SIWERTZ E + MARCE A
TRITIUM IN INVESTIGATION OF SURFACE HYDROLOGY. EXPERIMENTAL DETERMINATION OF COEFFICIENT OF RUNOFF
CENTRE OF GEODYNAMIC RESEARCH, THONON-LES-BAINS, HAUTE SAVOIE, FRANCE + BUREAU OF GEOLOGICAL RESEARCH AND MINING, ORLEANS, FRANCE
CSIRO-TRANS-10757 +. 5 PAGES, TRANSLATED FROM JOURNAL OF HYDROLOGY, VOL. 11, PP. 217-229 (1970)

MEASUREMENT OF TRITIUM CONTENTS IN RAIN AND RIVER ALLOWS FOR THE DETERMINATION OF ACTUAL PARTICIPATION OF RAINWATER IN RIVER FLOW DURING A FLOOD. WHEN THE DURATION OF THE FLOOD IS SHORTER THAN THE TRANSIT TIME OF THE GROUND WATER, THE TRITIUM CONTENT AFTER THE FLOOD BECOMES RE-ESTABLISHED AT THAT VALUE BEFORE THE FLOOD AND IT IS THEN NOT NECESSARY TO MEASURE THE TRITIUM IN THE SUBTERRANEAN WATERS. WHERE THE DURATION OF THE FLOOD DOES NOT EXCEED ONE WEEK, THIS SIMPLIFICATION IS VALID. IN THE REGION STUDIES, THE MEAN TRANSIT TIME OF THE SHALLOW GROUND WATER IS ABOUT A MONTH. THE INCREASE IN FLOW-RATE OF THE SUBTERRANEAN WATERS NOTED DURING FLOODS IS NOT ACCOMPANIED BY A VARIATION OF THEIR TRITIUM CONTENT. ONLY A PUTTING IN LOAD OF THESE WATERS IS INVOLVED AND NOT A MIXING OF THE INFILTRATING RAIN AND THE GROUND WATER. IT IS AS IF THE SHEET OF INFILTRATING WATER DRIVES THE WATER OF THE PREVIOUS RAINY PERIODS IN FRONT OF ITSELF. THUS ACTUAL DETERMINATION BY THIS METHOD OF THE PROPORTION OF THE RAIN WATER REMOVED DIRECTLY BY RUNOFF DURING FLOODS ALLOWS FOR ESTABLISHMENT OF A MORE SATISFACTORY HYDROLOGICAL BALANCE OF CATCHMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GROUND WATER + MEASUREMENT + *RAINOUT + *RIVER + *GROUND WATER, TRACER + *HYDROLOGY + *FLOODING COEFFICIENT + *FLOW + FLOOD + *CONCENTRATION + MATERIAL BALANCE

072960
COHEN JJ + HIGGINS GH
SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY
UCRL-73182 (REV. 1) + CONF-710809-15 +. 19 PAGES, FROM THE TRITIUM SYMPOSIUM, LAS VEGAS, NEVADA, AUGUST 30, 1971

IN ACCORDANCE WITH CURRENT GUIDANCE, TRITIUM RELEASES MUST BE KEPT BELOW QUANTITIES WHERE MPC LEVELS ARE EXCEEDED, AND SHOULD BE KEPT AS LOW AS PRACTICABLE. DETERMINATION OF PRACTICABILITY REQUIRES AN ANALYSIS OF BENEFIT-VERSUS-RISK CONSIDERATIONS. SUCH AN ANALYSIS WAS PERFORMED FOR CERTAIN GENERAL CASES. IT IS BASED ON A MER VALUE OF $250 (A MER IS THE AMOUNT OF BENEFIT REQUIRED TO JUSTIFY A RADIATION EXPOSURE OF ONE MAN-REM) AND CONSIDERS THE NATURE OF TRITIUM DISTRIBUTION IN THE BIOSPHERE AS WELL AS CERTAIN DEMOGRAPHIC FACTORS. IT ALSO ASSUMES THAT CONSTRAINTS IMPOSED BY EXPOSURE GUIDES ARE OBSERVED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GUIDE + KRYPTON + MPC + *REGULATION + *HAZARDS ANALYSIS + *RADIOACTIVITY RELEASE + DISTRIBUTION + *BENEFIT VS RISK + *SOCIO/PHILOSOPHICAL CONSIDERATION

072991
KONIG LA
ENVIRONMENTAL BURDENING BY TRITIUM
KERNFORSCHUNGSZENTRUM, KARLSRUHE, GERMANY
KFK-1560 +. 24 PAGES, 7 FIGURES, 38 REFERENCES, FEBRUARY 1972

REVIEWS PRESENT KNOWLEDGE WITH RESPECT TO THE TRITIUM BURDEN ON THE ENVIRONMENT. FOLLOWING A COMPILATION OF THE MOST IMPORTANT CHARACTERISTICS THE THEORETICAL RELATIONSHIP BETWEEN TRITIUM INCORPORATION AND RADIATION BURDEN IS DEALT WITH. SOURCES OF ENVIRONMENTAL TRITIUM CONTAMINATION ARE THE TRITIUM PRODUCED BY NATURE AND IN NUCLEAR FISSION REACTORS, THE USE OF TRITIUM-CONTAINING LUMINOUS COLOURS, AND, ABOVE ALL, THE NUCLEAR WEAPON TESTS. THE TRITIUM RELEASED UNDERGOES A WORLDWIDE SPREAD BY THE CIRCULATING WATER. THE RADIATION BURDEN DUE TO THIS TRITIUM CONTAMINATION AND EVALUATED BY CONCENTRATION MEASUREMENTS AMOUNTS PRESENTLY TO 0.1 MREM/A.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FALLOUT + FISSION PRODUCT RELEASE + MEASUREMENT + SOURCE, RADIATION + *TEST, WEAPONS + *FISSION PRODUCT TRANSPORT + REACTOR, POWER + *CONTAMINATION + *ENVIRONMENT + *SAFETY EVALUATION + *CONCENTRATION

073004
OESTLUND HG
STUDY OF TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT
MIAMI UNIVERSITY, ROSENSTIEL SCHOOL OF MARINE AND ATMOSPHERIC SCIENCES, FLORIDA
UM-RSMAS-72031 +. 14 PAGES, APRIL 15, 1972

IN ADDITION TO THE EXISTING GROUND-LEVEL STATIONS FOR ATMOSPHERIC HT AND HTO IN MIAMI AND FAIRBANKS, A THIRD STATION WAS ESTABLISHED AT THE MAUNA LOA OBSERVATORY, ISLAND OF HAWAII. ROUTINE SAMPLING AND ANALYSIS OF THE SAMPLES FROM ALL THREE GROUND STATIONS ON A TWICE-WEEKLY

073004 *CONTINUED*
BASIS HAVE BEEN CONTINUED. DATA UP TO THE END OF 1971 ARE AVAILABLE. A LONGITUDINAL PROFILE FROM THE U.S. TO 65 DEG S OF HT AND HTO WAS COLLECTED. A SECOND BIG GREEN BOX, AIRCRAFT SAMPLER, WAS BUILT AND SIX VERTICAL PROFILES ON THE NCAR SABRELINER WERE SAMPLED. A SAMPLING SYSTEM FOR THE RB-57F AIRCRAFT IS PRESENTLY UNDER CONSTRUCTION.

*MONITOR, AIR + SAMPLING + AIRCRAFT + ANALYTICAL TECHNIQUE + *MONITOR, ENVIRONMENTAL + MONITOR, GROUND SURFACE + MONITORING SYSTEM, RADIATION + RADIATION PROFILE

073740
HALES JM
SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN
BATTELLE NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-1659 +. 35 PAGES, 7 FIGURES, 7 TABLES, 14 REFERENCES, APRIL 1972

WASHOUT OF GASEOUS TRITIUM COMPOUNDS FROM THE ATMOSPHERE HAS BEEN INVESTIGATED THEORETICALLY. THIS ANALYSIS IS BASED UPON REVERSIBLE GAS-WASHOUT THEORY, AND ACCOUNTS FOR SUCH FACTORS AS DESORPTION AND THE INFLUENCE OF LIQUID-PHASE TRANSPORT. GENERAL EQUATIONS ARE PRESENTED WHICH DESCRIBE POLLUTANT CONCENTRATIONS IN SINGLE DROPS AS THEY FALL THROUGH THE ATMOSPHERE. RESULTS FROM THESE EQUATIONS MAY BE COMBINED TO PROVIDE TOTAL WASHOUT CHARACTERISTICS FOR NATURAL RAIN BY SIMPLE DISTRIBUTION OVER THE DROP-SIZE SPECTRA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

RAINOUT + *DESORPTION + PRECIPITATION + *WASHOUT + *GAS + CONCENTRATION + TRANSPORT

074336
KONIG LA + WINTER M
GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE TRACER
GESELLSCHAFT FUR KERNFORSCHUNG M.B.H., KARLSRUHE
KFK-1667 +. 34 PAGES, 2 TABLES, 5 FIGURES, 5 REFERENCES, NOVEMBER 1972

DISCUSSES DISPERSION EXPERIMENTS WITH TRITIATED WATER VAPOR AS THE TRACER CONDUCTED SO FAR AT THE KARLSRUHE NUCLEAR RESEARCH CENTER. THE HEIGHT OF THE SOURCE WAS 100 M. TO EVALUATE THE EMISSION, AIR HUMIDITY SAMPLES WERE FROZEN ON COLD SURFACES AT UP TO 25 POINTS IN THE FIELD OF DISPERSION. THE RESULTS SHOW CONSIDERABLE DEVIATIONS FROM THEORETICAL VALUES BOTH WITH RESPECT TO THE AMOUNTS AND THE SOURCE DISTANCES OF THE ABSOLUTE MAXIMA OF CONCENTRATION. (IN GERMAN)

AVAILABILITY - GESELLSCHAFT FUER KERNFORSCHUNG MGH, 75 KARLSRUHE, POSTFACH 947, GERMANY

*ATMOSPHERIC DIFFUSION EXPERIMENT + COMPARISON, THEORY AND EXPERIENCE + INSTRUMENT, AIR SAMPLING

074536
KIRCHMANN R + VAN DEN HOEK J
TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN
CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE, MOL, BELGIUM
10 PAGES, J. BELGE RADIO., 55(2), PP. 233-242 (1972)

TRITIUM IN THE ENVIRONMENT ORIGINATES FROM NATURAL AND ARTIFICIAL SOURCES: THE NATURAL PRODUCTION RATIO (INTERACTION, COSMIC RAYS ON NITROGEN AND OXYGEN IN THE AIR) AND THE ARTIFICIAL PRODUCTION RATIO (NUCLEAR BOMB EXPLOSIONS, POWER REACTORS) ARE INDICATED. DATA ON THE MOVEMENT OF TRITIUM IN THE ENVIRONMENT AND ESTIMATES OF TRITIUM PRODUCTION AND RELEASE BY NUCLEAR INSTALLATIONS ARE GIVEN AND BRIEFLY COMMENTED ON. THE WAYS IN WHICH PLANT-LIFE IS CONTAMINATED ARE NUMEROUS (ABSORPTION BY ROOT OR LEAF, VAPOUR EXCHANGE) AND THE MECHANISM RESPONSIBLE FOR TRITIUM INCORPORATION IN PLANT ORGANIC MATTER IS THAT OF PHOTOSYNTHESIS.

*POPULATION EXPOSURE + CONTAMINATION + RADIOACTIVITY RELEASE + *ABSORPTION + *RADIONUCLIDE UPTAKE + CONCENTRATION + *FOOD CHAIN + *RADIONUCLIDE TRANSFER + VAPOR EXCHANGE

075112
SOIFER VN + ROMANOV VV + GASILINA NK + ROSLYI EI
SCREENING EFFECT OF CONTINENTS WHICH DETERMINE THE ISOTOPIC COMPOSITION OF ATMOSPHERIC MOISTURE (BASED ON THE TRITIUM SPACE-TIME DISTRIBUTION IN THE ATMOSPHERIC PRECIPITATION OF THE NORTHERN HEMISPHERE)
INSTITUTE OF WATER PROBLEMS, MOSCOW
4 PAGES, DOKL.AKAD. NAUK SSSR, 210(1), PP. 78-81 (NOVEMBER 1, 1971) IN RUSSIAN)

THE AVERAGE YEARLY FALLOUT OF TRITIUM IN THE NORTHERN HEMISPHERE WAS ESTIMATED FROM MEASUREMENTS IN JUNE, AUGUST, SEPTEMBER, AND NOVEMBER IN A NUMBER OF RUSSIAN CITIES. FOR GEOPHYSICAL INTERPRETATION OF THE RESULTS OF TRITIUM IN SEDIMENTATION, THE AVERAGE CONCENTRATION OF TRITIUM IN A 5-KILOMETER COLUMN OF ATMOSPHERIC MOISTURE WAS TAKEN TO BE EQUAL TO THE TRITIUM CONCENTRATION IN THE AVERAGE MONTHLY PRECIPITATION FROM IT. THE DATA ARE DISCUSSED IN TERMS OF A SCREENING EFFECT OF THE CONTINENTAL SURFACE, IN CONTRAST TO TRITIUM IN THE ATMOSPHERIC MOISTURE ABOVE THE OCEANS.

*ATMOSPHERIC CIRCULATION, GLOBAL + FALLOUT + MEASUREMENT + OCEAN AND SEA + SURFACE CONTAMINATION + *ATMOSPHERIC POLLUTION + *MONITOR + PRECIPITATION + USSR + ENVIRONMENT + METEOROLOGY + SEDIMENT + COMPARISON

075246
RUDOLPH AW + CARROLL TE + DAVIDSON RS
TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY
BATTELLE COLUMBUS LABORATORIES, OHIO
BMI-171-302 +. 250 PAGES, FIGURES, TABLES, REFERENCES, JUNE 30, 1971

THIS BIBLIOGRAPHY WAS COMPILED TO PROVIDE DETAILED SUBJECT ACCESS TO THE LITERATURE ON TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT, WITH EMPHASIS ON MAN. THE ABSTRACTS ARE, FOR THE MOST PART, OF THE INDICATIVE TYPE -- INTENDED TO DESCRIBE THE CONTENT OF THE REFERENCES WITHOUT RELATING SPECIFIC DETAILS. ALL INDEX TERMS ASSOCIATED WITH EACH ARTICLE ARE LISTED IN THE COMPILATION IMMEDIATELY FOLLOWING THE ABSTRACT. TO PROVIDE ACCESS TO THE CONTENTS OF THE COMPILATION, A SUBJECT, AUTHOR, AND REPORT-NUMBER INDEX ARE PROVIDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIBLIOGRAPHY + *BATTELLE NORTHWEST + ENVIRONMENT + *RADIATION EFFECT + RADIATION EXPOSURE + *MAN + REPORT, ENVIRONMENTAL

075309
ANTONELLI A + BOMBACE MA + CIGNA AA + CIGNA R + LANERI U
RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE EUREX NUCLEAR PLANT
CNEN, DIV. NE PROT. SAN. E CONTROLLI AND LB. RADIOATTIVITA AMBIENTALE, ROME, ITALY
44 PAGES, 1 FIGURE, 1 TABLE, 8 REFERENCES, PRESENTED AT THE SYMPOSIUM ON RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT, ROME, SEPTEMBER 1972

TRACER EXPERIMENTS WERE CONDUCTED OF MIXING IN THE DORA BALTEA RIVER AND OF THE PO RIVER DOWNSTREAM OF ITS CONFLUENCE WITH THE DORA. ESTIMATES WERE MADE OF RADIONUCLIDE PATHWAYS TO MAN VIA DRINKING WATER, IRRIGATION WATER (THROUGH VEGETABLES AND MILK), AND FISH CONSUMPTION. MAXIMUM RELEASE RATES (FOR TRITIUM, MN, FE, CO, ZN, SR, RU, CS, CE, AND PU RADIONUCLIDES) ARE LISTED WHICH ENSURE A WIDE SAFETY MARGIN, AND IT IS SHOWN THAT IN ALL CASES DRINKING WATER IS THE MORE CRITICAL PATHWAY.

AVAILABILITY - OFFICE FOR OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES, P.O.B. 1003, LUXEMBOURG 1

CESIUM + COBALT + CONCENTRATION, MAXIMUM + EURATOM + PLUTONIUM + RUTHENIUM + STRONTIUM + MANGANESE + WASTE DISPOSAL, RIVER + ZINC + MILK + DIETARY HABIT + DOSE CALCULATION, INTERNAL + *WATER, DRINKING + IRON + CRITICAL NUCLIDE PATHWAY + ITALY + WATER, IRRIGATION + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + *FOOD CHAIN + FIELD EXPERIMENT + ECOSYSTEM, MODEL

075491
KLINE JR + COLON JA + BRAR SS + STEWART ML + JORDAN CF
RADIOLOGICAL PHYSICS DIVISION ANNUAL REPORT. ENVIRONMENTAL RESEARCH, TERRESTRIAL ECOLOGY, JAN.-DEC. 1971
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-7860(PT.3) +. 63 PAGES, 17 FIGURES, 3 TABLES, 51 REFERENCES, PP. 1-63, DECEMBER 1971

CS-137 IN PUERTO RICAN SOILS AND VEGETATION INCREASED IN AREAS WHERE RAINFALL WAS HIGH AND VEGETATION GAVE HIGH AEROSOL INTERCEPTION. TRITIUM MOVEMENT IN SOIL AGREED WITH PREDICTIONS BY THE ARGONNE MODEL. TRITIATED WATER WAS USED AS A TRACER FOR MEASUREMENTS OF TRANSPIRATION AND BIOMASS IN CONIFEROUS FORESTS. TRITIUM UPTAKE IN SIMPLE AQUATIC FOOD CHAINS (INCLUDING ALGAE, TADPOLES, AND SNAILS) SHOWED THAT THE BOUND TRITIUM CONTENT OF ANIMALS FEEDING ON TRITIATED ALGAE WAS OF THE SAME MAGNITUDE AS THAT OF THEIR FOOD, BUT THAT THERE WAS A 3-10 FOLD DISCRIMINATION AGAINST HTO-DERIVED TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + SOIL, RADIONUCLIDE MOVEMENT THROUGH + *CRITICAL NUCLIDE PATHWAY + *PUERTO RICO + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + FOOD CHAIN + PLANT, SPERMATOPHYTE + ECOSYSTEM, FOREST + PLANT, ALGAE/FUNGI + RADIATION EFFECT, ECOSYSTEM + ECOSYSTEM, TROPICAL + ECOSYSTEM, MODEL

075494
GASPAR E
RADIOACTIVE TRACERS FOR HYDROLOGICAL WORKS
INSTITUT DE FIZICA ATOMICA, BUCHAREST (ROMANIA)
IFA-MR-36 +. 24 PAGES, 4 FIGURES, 2 TABLES, 16 REFERENCES, 1971

BR-82 IS USED WITH SAND-CLAY SOILS, BUT I-131 IS TOO STRONGLY ABSORBED ALTHOUGH IT IS SUITABLE FOR OTHER SOIL TYPES. THE LONGER HALF-LIVES OF I-125 AND BR-86 MAKES THEM USEFUL FOR STUDIES OF LONGER DURATION. ISOTOPE EXCHANGE GENERALLY LIMITS TRITIUM TO MEDIUM DURATION STUDIES, AND MEASUREMENT OF ITS LOW-ENERGY RADIATION IS DIFFICULT. RU-106 AND KR-85 ARE SUITABLE FOR LONG DURATION STUDIES. FLOWING WATER MAY BE MARKED CONTINUOUSLY BY A SOLUBLE, RADIOACTIVE PRODUCT FROM THE RADIOACTIVE DECAY OF AN INSOLUBLE (SOURCE) RADIONUCLIDE. IN ADDITION TO SR-90 (AS SULFATE)-Y90, 17 OTHER SUCH SOURCE-DAUGHTER PAIRS ARE LISTED. FOR HUNTING LEAKS IN WATER RESERVOIRS, NH4BR IS USED WITH DETECTION BY NEUTRON ACTIVATION ANALYSIS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVATION + IODINE + KRYPTON + RUTHENIUM + STRONTIUM + *TRACER, RADIOACTIVE + *HYDROLOGY + ION EXCHANGE + SOIL PROPERTY + TEST, LEAK LOCATION + BROMINE + HYDROLOGY, RATE OF MOVEMENT + *REVIEW + IMPOUNDMENT + STABLE ISOTOPE + DURATION, SHORT + DURATION, LONG

075576
SMEETS JGPM + BERLIN A + AMAVIS RJ
SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT
COMMISSION OF THE EUROPEAN COMMUNITIES, LUXEMBOURG (BELGIUM)
12 PAGES, 1 TABLE, NUCLEAR SAFETY, 13(5), PP. 380-391 (SEPTEMBER/OCTOBER 1972)

THE SYMPOSIA PAPERS (SEPARATE ABSTRACTS APPEAR IN NSIC ABSTRACTS FOR MOST) ARE LISTED AND CHARACTERIZED BRIEFLY. SOME OF THE QUESTIONS RAISED AT A 2.5-HOUR PANEL DISCUSSION ARE PRESENTED - EFFECTS FROM TRITIUM PRODUCED BY FAST REACTORS, ACCOUNTING FOR PARAMETERS WHICH AFFECT RADIONUCLIDE UPTAKE, THE TERM 'LIMITING RADIOLOGICAL CAPACITY' INCLUDES NO SAFETY FACTORS, THE TERM 'CRITICAL POPULATION' DOES NOT ACCOUNT FOR MULTIPLE SOURCES AND EFFECTS FROM OTHER POLLUTANTS, AND EXTENSION OF THE EURATOM TREATY TO NONRADIOACTIVE POLLUTANTS. ANSWERS TO MANY OF THESE QUESTIONS REQUIRE FURTHER WORK IN 'RADIOLOGICAL FORECASTING' FOR A HYDROLOGICAL BASIN, ALSO IN ANALYSIS OF HAZARDS IN CONNECTION WITH BOTH RADIOACTIVE WASTE DISPOSAL AND ENVIRONMENTAL CONTAMINATION BY TRITIUM AND THE NOBLE-GAS RADIONUCLIDES.

ECOLOGY + EURATOM + NOBLE GAS + ATMOSPHERIC POLLUTION + WASTE DISPOSAL + *CRITICAL NUCLIDE PATHWAY + *ENVIRONMENT + WATER POLLUTION + FORECAST + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + *FOOD CHAIN + POLLUTION + ECOSYSTEM, MARINE + ECOSYSTEM, MODEL + SYSTEM ANALYSIS + MODEL, DETERMINISTIC + ECOSYSTEM, ESTUARINE + ORGANIZATION, INTERNATIONAL

075733
NORK WF + FORSLOW EJ + ESSINGTON EH
RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA
TELEDYNE ISOTOPES, INC.
NVO-1229-175 +, 84 PAGES, 8 TABLES, 3 FIGURES, 1 REFERENCE, SEPTEMBER 1971

A 1969-1970 SURVEILLANCE PROGRAM OF TRANSPORT OF RADIOACTIVITY THROUGH GROUND WATER FROM THE SITES OF UNDERGROUND NUCLEAR DETONATIONS IS DESCRIBED, AND IT IS RECOMMENDED THAT ONCE-A-YEAR SAMPLING CONTINUE. IN A RELATED STUDY, DISTRIBUTION COEFFICIENTS (GRAMS RADIONUCLIDE IN ONE GRAM OF MINERAL CORE/GRAMS RADIONUCLIDE IN ONE ML OF ASSOCIATED GROUND WATER) WERE DETERMINED BY ADDING RADIONUCLIDES TO ENVIRONMENTAL SAMPLES. DISTRIBUTION COEFFICIENTS RANGED FROM 30 TO 2800 FOR CA-45; 25 TO 2500 FOR SR-85; AND 70 TO 5000 FOR CS-137.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SOIL, RADIONUCLIDE MOVEMENT THROUGH + *GROUND WATER, NUCLIDE OCCURRENCE + GROUND WATER, PROPERTY + GROUND WATER, TRACER + *NEVADA TEST SITE + MONITOR, BACKGROUND + CRITICAL NUCLIDE PATHWAY + ION EXCHANGE + RADIOCHEMICAL ANALYSIS + SORPTION + HYDROLOGY, RATE OF MOVEMENT + SOIL PROPERTY, IN SITU + SURVEILLANCE PROGRAM + RADIONUCLIDE UPTAKE + *RADIONUCLIDE TRANSFER + SEDIMENT + DISTRIBUTION

076284
KINCAID GP JR
CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE
TEXAS A&M UNIVERSITY
243 PAGES, 15 TABLES, 10 FIGURES, AUGUST 1971

SEA WATER FROM THE YUCATAN STRAIT IS THE MAJOR SOURCE OF TRITIUM FOR THE WESTERN GULF. SEA WATER FIRST CARRIES THE H-3 OF THE YUCATAN STRAIT, AND THEN TO THE WESTERN GULF. THE PHYSICAL PROPERTIES OF THE WATER MASS THAT EXTENDS FROM THE SURFACE OF THE DEPTH OF THE SUBTROPICAL UNDERWATER, AND THE H-3 CONTENT, ARE MODIFIED BY MIXING PROCESSES AS THE WATER MOVES WESTWARD. THE INTEGRATED H-3 CONTENT OF THE WATER COLUMNS, TO A DEPTH OF 150 M, IS HIGHER IN THE WESTERN GULF THAN IN THE YUCATAN STRAIT. THIS EXCESS IS DUE TO THE INPUT OF H-3 FROM RUNOFF AND RAINFALL. A 2-BOX MODEL WAS DEVELOPED FOR THE MIXING AND EXCHANGE OF WATER MASSES IN THE UPPER LAYERS OF THE GULF OF MEXICO.

COUNTER + *DEPOSITION + *OCEAN AND SEA + REACTOR, RESEARCH + *SAMPLING + *MIXING DEPTH + CROSS SECTION + *CONCENTRATION + *DISTRIBUTION + MODEL, DETERMINISTIC + RETENTION + SPECTROMETRY

076284
KINCAID GP JR
CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE
TEXAS A&M UNIVERSITY
243 PAGES, 15 TABLES, 10 FIGURES, AUGUST 1971

SEA WATER FROM THE YUCATAN STRAIT IS THE MAJOR SOURCE OF TRITIUM FOR THE WESTERN GULF. SEA WATER FIRST CARRIES THE H-3 OF THE YUCATAN STRAIT, AND THEN TO THE WESTERN GULF. THE PHYSICAL PROPERTIES OF THE WATER MASS THAT EXTENDS FROM THE SURFACE OF THE DEPTH OF THE SUBTROPICAL UNDERWATER, AND THE H-3 CONTENT, ARE MODIFIED BY MIXING PROCESSES AS THE WATER MOVES WESTWARD. THE INTEGRATED H-3 CONTENT OF THE WATER COLUMNS, TO A DEPTH OF 150 M, IS HIGHER IN THE WESTERN GULF THAN IN THE YUCATAN STRAIT. THIS EXCESS IS DUE TO THE INPUT OF H-3 FROM RUNOFF AND RAINFALL. A 2-BOX MODEL WAS DEVELOPED FOR THE MIXING AND EXCHANGE OF WATER MASSES IN THE UPPER LAYERS OF THE GULF OF MEXICO.

COUNTER + *DEPOSITION + *OCEAN AND SEA + REACTOR, RESEARCH + *SAMPLING + *MIXING DEPTH + CROSS SECTION + *CONCENTRATION + *DISTRIBUTION + MODEL, DETERMINISTIC + RETENTION + SPECTROMETRY

076899
ERIKSSON E
AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE
INTERNATIONAL METEOROLOGICAL INSTITUTE, SWEDEN
13 PAGES, 3 TABLES, 10 FIGURES, REFERENCES, TELLUS, XVII(1), PP. 118-130 (1965)

BOMB TRITIUM PRODUCED SINCE 1954 DURING BOMB TESTS WAS BY AND LARGE INJECTED INTO THE STRATOSPHERE. THE EXACT AMOUNTS ARE NOT KNOWN BUT VARIOUS ESTIMATES AGREE REASONABLY WELL. THE FATE OF THE BOMB PRODUCED TRITIUM IS DISCUSSED IN SOME DETAIL AND IT APPEARS THAT OCEAN SURFACES ARE VERY EFFECTIVE FOR WITHDRAWING ATMOSPHERIC TRITIUM. AVAILABLE DATA ON RAINFALL CONCENTRATIONS ARE ALSO REVIEWED AS WELL AS VARIOUS MODELS PUT FORTH TO EXPLAIN THE TRANSPORT OF TRITIUM IN NATURE.

OCEAN AND SEA + *TESTING + *ATMOSPHERIC POLLUTION + *NUCLEAR DETONATION + PRECIPITATION + CONCENTRATION + TRANSPORT

076901
MARTELL FA
ON THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN ATMOSPHERIC METHANE
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH
11 PAGES, 2 TABLES, 4 FIGURES, REFERENCES, J. OF GEOPHYSICAL RESEARCH, 68(13), PP. 3759-3769 (JULY 1963)

CONSIDERATION OF THE BOMB-PRODUCED TRITIUM INVENTORY AND FEATURES OF THE BUDGET AND DISTRIBUTION OF TRITIUM IN ATMOSPHERIC WATER VAPOR, HYDROGEN, AND METHANE PROVIDES A BASIS FOR REJECTING PREVIOUS EXPLANATIONS FOR THE INCORPORATION OF ARTIFICIAL TRITIUM INTO ATMOSPHERIC METHANE. IT IS CONCLUDED THAT TRITIATED HYDROGEN IS PRODUCED IN THERMONUCLEAR CLOUDS BY RADIATIVE DISSOCIATION OF WATER UNDER OXIDIZING CONDITIONS. THE OCCURRENCE OF TRITIATED METHANE IS EXPLAINED BY TROPOSPHERIC EXCHANGE OF METHANE WITH TRITIATED HYDROGEN WHICH HAS MIXED DOWNWARD FROM THE STRATOSPHERE. CHEMICAL AND ENERGY CRITERIA FOR THE EXCHANGE OF METHANE AND HYDROGEN IN THE LOWER ATMOSPHERE ARE DISCUSSED. HIGH TRITIUM CONCENTRATION OF FORMALDEHYDE FROM THUNDERSTORM RAINS IS PREDICTED.

HYDROGEN + *ATMOSPHERIC POLLUTION + NUCLEAR DETONATION + WATER VAPOR + GAS + REACTOR, THERMONUCLEAR + *CONCENTRATION + CLOUD

077191
MOGHISSI AA + CARTER MW
TRITIUM
807 PAGES, PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

'TRITIUM' IS BASED ON A SYMPOSIUM HELD FROM AUGUST 30 THROUGH SEPTEMBER 2, 1971, IN LAS VEGAS, NEVADA, AND COSPONSORED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA, LAS VEGAS. THE ORGANIZERS ATTEMPTED TO COVER THE ENTIRE SUBJECT, ALTHOUGH PRIMARY EMPHASIS WAS PLACED ON THE ENVIRONMENTAL ASPECTS OF TRITIUM. THE BOOK IS DIVIDED INTO TEN CHAPTERS COVERING THE HISTORY, PRODUCTION, MEASUREMENT, BIOLOGICAL EFFECTS AND KINETICS, ENVIRONMENTAL ASPECTS, APPLICATION AND HEALTH PHYSICS OF TRITIUM.

CONTAINMENT + EFFLUENT + MEASUREMENT + *PLOWSHARE + HAZARD, RELATIVE + *WASTE TREATMENT + *TEST, WEAPONS + *REACTOR, POWER + MONITOR, ENVIRONMENTAL + *NUCLEAR DETONATION + RADIOACTIVITY RELEASE + ENVIRONMENT + DATA COLLECTION + *PRODUCTION + RADIATION EFFECT + BIOLOGICAL CONTROL + *SOCIO/PHILOSOPHICAL CONSIDERATION + HPIS

077835
TADMOR J
DEPOSITION OF KR-85 AND TRITIUM RELEASED FROM A NUCLEAR FUEL REPROCESSING PLANT
STOREQ NUCLEAR RESEARCH CENTRE, ISRAEL + TEL AVIV UNIVERSITY
6 PAGES, 25 REFERENCES, HEALTH PHYSICS, 24(1), PP. 37-42 (JANUARY 1973)

THE ATMOSPHERIC DEPOSITION PARAMETERS FOR KR-85 AND H-3 (AS HTO VAPOR) CONTINUOUSLY RELEASED FROM A NUCLEAR FUEL REPROCESSING PLANT ARE ESTIMATED. THESE INCLUDE WASHOUT AND DRY DEPOSITION AND DEPOSITION THROUGH ADSORPTION ON PARTICULATE MATTER. THEORETICAL CONSIDERATIONS SUGGEST THAT THE DEPOSITION COEFFICIENTS AT STEADY STATE CONDITIONS, FOR A CONTINUOUS RADIOACTIVE SOURCE ARE LOWER THAN THOSE COMPUTED FROM THE GENERAL DEPOSITION RELATIONS PROPOSED TO DATE, BECAUSE OF THE INTERFERENCE OF THE CORRESPONDING STABLE ELEMENTS IN THE ATMOSPHERE, AND BECAUSE OF THE IMPERFECT SINK CHARACTERISTICS OF THE SOIL SURFACE.

ADSORPTION + *DEPOSITION + ELEMENTS AND ISOTOPES + FALLOUT + *KRYPTON + *ATMOSPHERIC POLLUTION + *RADIOACTIVITY RELEASE + WASHOUT + *FUEL REPROCESSING + STABLE ISOTOPE

077945
MAWSON CA + COWPER G
ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972
ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER
AECL-4272 +, 32 PAGES, 3 FIGURES, SEPTEMBER 1972

EFFLUENTS AND NEARBY NATURAL WATERS WERE MONITORED FOR RADIONUCLIDES. A METHOD FOR DETERMINATION OF LOW LEVELS OF STABLE COBALT WAS DEVELOPED. STUDIES WERE INITIATED ON RADIOACTIVE AND STABLE SR IN LAKE SEDIMENT, ON THE TRITIUM INPUT TO A LAKE VIA GROUND WATER, AND OF THE ROLE OF TRITIUM RETENTION BY SOIL ON THE EVAPORATION OF TRITATED WATER FROM ECOSYSTEMS. UPTAKE OF PHOSPHATE AND FERRIC IONS BY AQUATIC PLANTS OCCURRED THROUGH THE ROOTS, EVEN IN FLOATING SPECIES WITH SUBMERGED

077945 *CONTINUED*
ABSORBENT LEAVES. MONITORING METHODS WERE DEVELOPED FOR T AND I IN AIR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + COBALT + IODINE + MONITOR, LIQUID + STRONTIUM + TRACER, RADIOACTIVE + SURFACE WATER, NUCLIDE OCCURRENCE + GROUND WATER, NUCLIDE OCCURRENCE + IRON + PHOSPHATE + SOIL, NUCLIDE OCCURRENCE + CRITICAL NUCLIDE PATHWAY + *CHALK RIVER + METEOROLOGY + WATER POLLUTION + MONITORING PROGRAM, ENVIRONMENTAL + LAKE + *RADIONUCLIDE UPTAKE + *ECOSYSTEM, AQUATIC + RADIONUCLIDE TRANSFER + SEDIMENT + INSECT + RADIATION MONITORS + INSTRUMENTS, MISC.

078450
WETHINGTON JA
AN INVESTIGATION OF TRITIUM DECONTAMINATION
UNIVERSITY OF FLORIDA + LAWRENCE LIVERMORE LABORATORY
ORO-4201-2 +. 32 PAGES, 1972

THE STIMULATION OF GAS WELLS BY NUCLEAR EXPLOSIONS PRODUCES T-CONTAINING GAS AND WATER. EXCHANGE REACTIONS CAN BE USED TO DECONTAMINATE THESE MATERIALS. THE T-CONTENT OF H2O WAS REDUCED BY CONTACT WITH CERTAIN SANDSTONES, SHALES, AND CLAYS. EXPOSURE WAS AT ROOM TEMPERATURE OR AT ELEVATED TEMPERATURES. CONTACT WITH OTHER SANDSTONES, OTHER CLAYS, GRANDIORITE, ETC., RESULTED IN LITTLE DECONTAMINATION. BECAUSE OF CURRENT INTEREST IN THE RIO BLANCO EXPERIMENT, A SANDSTONE AND A SHALE FROM THE SITE WERE TRIED. THE T-CONTENT OF WATER WAS NOT REDUCED, AND THE SAMPLES SHOWED NO CATALYTIC ACTIVITY FOR THE EXCHANGE REACTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + EFFLUENT + GEOLOGY + WATER + NUCLEAR DETONATION + SOIL PROPERTY + SOIL MECHANICS + GAS + STIMULATION + RESOURCE, NATURAL

079242
HALES JM
SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN
BATTELLE MEMORIAL INSTITUTE
BNWL-1659+. 43 PAGES, 14 REFERENCES, APRIL 1972

WASHOUT OF GASEOUS TRITIUM COMPOUNDS FROM THE ATMOSPHERE WAS INVESTIGATED THEORETICALLY BASED UPON THE REVERSIBLE GAS-WASHOUT THEORY INCLUDING PARAMETERS OF DESORPTION AND THE INFLUENCE OF LIQUID-PHASE TRANSPORT. GENERAL EQUATIONS BASED UPON ASSUMPTIONS OF VERTICAL RAINFALL, SPHERICAL NONINTERACTING DROPS, AND LINEARITY OF THE MASS-TRANSPORT PROCESSES, ARE PRESENTED TO DESCRIBE POLLUTANT CONCENTRATIONS IN SINGLE DROPS AS THEY FALL THROUGH THE ATMOSPHERE. SAMPLE CALCULATIONS ARE PRESENTED FOR A SPECIFIC RAIN SITUATION IN CONJUNCTION WITH BIVARIATE, NORMALLY DISTRIBUTED PLUMES CONTAINING HT AND HTO; HTO WAS WASHED OUT MUCH MORE RAPIDLY THAN HT DUE TO THE LOW SOLUBILITY OF THE LATTER. FOG FORMATION WAS IMPORTANT IN AFFECTING HTO WASHOUT BUT AN INSIGNIFICANT INFLUENCE INSOFAR AS HT WAS CONCERNED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*AIR + DESORPTION + PRECIPITATION + METEOROLOGY + THEORETICAL INVESTIGATION + *WASHOUT + GAS

079324
BERNHARD M
ANNUAL REPORT, 1971. STUDIES ON THE RADIOACTIVE CONTAMINATION OF THE SEA
COMITATO NAZIONALE PER L'ENERGIA NUCLEARE, ITALY
EUR-4865.E+. 162 PAGES, FIGURES, TABLES, REFERENCES, AUGUST 1972

THE EIGHT ANNUAL REPORT OF THE CNEN-EURATOM CONTRACT OF ASSOCIATION IS PRESENTED. THE PROGRAMME LAID DOWN IN THIS CONTRACT CALLS FOR STUDIES OF THE FACTORS WHICH INFLUENCE THE UPTAKE, ACCUMULATION AND LOSS OF RADIOISOTOPES BY DIFFERENT INORGANIC AND ORGANIC CONSTITUENTS OF THE MARINE ENVIRONMENT. THE PROGRAMME IS DIVIDED INTO TWO PARTS - (A) THE INVESTIGATION OF RELEVANT RADIOECOLOGICAL AND ECOLOGICAL FACTORS IN NATURE AND UNDER LABORATORY CONDITIONS; (B) THE INVESTIGATION OF THE OUTFALL AREA OFF-SHORE OF THE CNEN-TRISAIA CENTRE IN THE GULF OF TARANTO (FUEL REPROCESSING PLANT).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + COBALT + ELEMENTS AND ISOTOPES + *FALLOUT + IODINE + *OCEAN AND SEA + STRONTIUM + SAMPLING + POPULATION EXPOSURE + *ANIMAL, FISH + CONCENTRATION + *FOOD CHAIN + *AQUATIC ORGANISM + *ECOSYSTEM + PLANT, ALGAE/FUNGI + FOOD

079408
FENSKE PR
EVENT-RELATED HYDROLOGY AND RADIONUCLIDE TRANSPORT AT THE CANNIKIN SITE, AMCHITKA ISLAND, ALASKA
UNIVERSITY OF NEVADA, RENO
NVO-1252-1 +. 37 PAGES, 17 FIGURES, 21 REFERENCES, MAY 1972

EVALUATION OF POSSIBLE GROUND-WATER CONTAMINATION FROM THE CANNIKIN SITE INVOLVED CONSIDERATION OF THERMAL EFFECTS IN THE RUBBLE CHIMNEY, GROUND-WATER TRANSIT TIME ALONG PROBABLE FLOW PATHS, AND THE RATE OF DILUTION OF FRESH-WATER SEEPAGE WITH SEA WATER. MEASUREMENTS OF TEMPERATURE AND

079408 *CONTINUED*
PRESSURE IN TEST HOLES AND WATER ANALYSES WERE USED TO LOCATE THE FRESHWATER-SALTWATER INTERFACE. THE HYDRAULIC CONDUCTIVITY WAS ESTIMATED FROM THE RESPONSE IN TEST HOLES TO BAROMETRIC AND TIDAL FLUCTUATIONS. ELECTRICAL ANALOGUE SIMULATION OF THE HYDRAULIC CONDUCTIVITY OF FRACTURE NETWORKS GAVE A RESIDENCE TIME OF 14,000 YEARS FOR THE UNDERLYING SALINE AQUIFER. THE TRANSIT TIME THROUGH THE FRESHWATER LENS TO THE SEA IS ABOUT 3000-4000 YEARS - SUCH THAT TRITIUM IS ELIMINATED BY RADIOACTIVE DECAY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAINMENT ANALYSIS + DILUTION + OCEAN AND SEA + SOIL, RADIONUCLIDE MOVEMENT THROUGH + *GROUND WATER, NUCLIDE OCCURRENCE + CRITICAL NUCLIDE PATHWAY + ANALOG SIMULATION + *NUCLEAR EXPLOSION DEBRIS + HYDROLOGY, RATE OF MOVEMENT + WATER POLLUTION + SOIL PROPERTY, IN SITU + *ALASKA

080611
DICKERSON MH + CRAWFORD TV
IN-CLOUD PRECIPITATION SCAVENGING OF TRITIATED WATER VAPOR
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
UCRL-51283 +. 7 PAGES, 1 TABLE, 1 FIGURE, 12 REFERENCES, SEPTEMBER 22, 1972

A METHOD FOR CALCULATING THE DEPOSITION OF TRITIUM FOLLOWING A NUCLEAR BURST CONSIDERS THE INTERACTION OF TRITIATED WATER VAPOR WITH PRECIPITATION. IT CALCULATES THE LONG-RANGE WET DEPOSITION OF TRITIUM FROM THE CALCULATED DEBRIS-CLOUD CONCENTRATION AND THE MEASURED TOTAL RAINFALL, TEMPERATURE, AND DEW POINT. THE METHOD IS TESTED BY USING DATA FROM A RUSSIAN NUCLEAR EXCAVATION EXPERIMENT. THE CALCULATED VALUES ARE FROM 0.2 TO 2.5 TIMES THE MEASURED VALUES. THE DIFFERENCES MAY REFLECT THE LIMITED METEOROLOGICAL AND DEPOSITION MEASUREMENTS, THE HIGHLY VARIABLE TOPOGRAPHY, AND UNCERTAINTIES IN WIND VELOCITY AND DIRECTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DEPOSITION + MEASUREMENT + RAINOUT + *DOSE CALCULATION, EXTERNAL + PRECIPITATION + METEOROLOGY + TOPOGRAPHY + WATER VAPOR + CONCENTRATION + CLOUD

081106
HECKMAN PA + COWLES JO
REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL FORMATIONS
U.S. PATENT 3,703,708 +. NOVEMBER 21, 1972

THIS PATENT RELATES TO OXIDIZING AGENTS WHICH ARE DISPOSED CIRCUMJACENT TO A NUCLEAR DEVICE DETONATED IN A GEOLOGICAL FORMATION, GENERALLY A CARBONACEOUS OR PETROLIFEROUS FORMATION, TO PROVIDE A MORE OXIDIZING ENVIRONMENT THEREABOUT. UPON DETONATION OF THE DEVICE REDUCTANTS PRESENT IN THE FORMATION AS WELL AS IN EMPLACEMENT COMPONENTS ARE OXIDIZED. CONSEQUENTLY TRITIUM PRODUCED BY THE DETONATION TOGETHER WITH ANY HYDROGEN GAS PRESENT TENDS TO BE OXIDIZED TO FORM A TRITIATED WATER PRODUCT. THE WATER COMBINES WITH INORGANIC MATERIALS IN THE VICINITY OF THE DETONATION AND IS IMMOBILIZED OR FALLS TO THE BOTTOM OF THE DETONATION PRODUCED CAVITY SO AS TO MINIMIZE THE TRITIUM CONTENT OF ORGANIC MATERIALS EVOLVED BY THE FORMATION.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (25 CENTS/COPY)

OXIDATION + *WASTE TREATMENT + *NUCLEAR DETONATION + WASTE MANAGEMENT + UNITED STATES + PATENT

081445
REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5234-MS +. 9 PAGES, 7 TABLES, 5 FIGURES, 3 REFERENCES, APRIL 1973

SURFACE AND GROUND WATER SAMPLES WERE ANALYZED FOR TRITIUM FROM 113 SAMPLING STATIONS DURING THE PERIOD AUGUST 1966 THROUGH MAY 1969. TRITIUM WAS DETECTED ONLY IN SURFACE AND GROUND WATER IN THE STREAM-CONNECTED AQUIFERS IN THE ALLUVIUM OF DP, LOS ALAMOS, AND MORTANDAD CANYONS WHICH ARE CONTROLLED AREAS. THESE CANYONS RECEIVE TREATED LOW-LEVEL RADIOACTIVE EFFLUENTS. THE TRITIUM IN DP AND LOS ALAMOS CANYON IS FROM OLD SEEPAGE PITS THAT CONTAINED TRITIUM. THE TRITIUM CONCENTRATIONS DECREASE DOWNGRADIENT IN THE CANYONS DUE TO DILUTION WITH OTHER WASTE WATER, SEWAGE EFFLUENT, AND STORM RUNOFF.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + DILUTION + GROUND WATER + SURFACE WATER + *SURVEY, RADIATION + *LASL + MONITOR, AREA + *CONCENTRATION

082301
OSTLUND HG
CERTAIN ENVIRONMENTAL ASPECTS OF TRITIUM
UNIVERSITY OF MIAMI, FLORIDA
113 PAGES, PP. 387-495 OF "TRITIUM", PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BBOK)

REPORTS ON TOPICS SUCH AS ENVIRONMENTAL TRITIUM, TRITIUM IN THE ATMOSPHERE AND OCEAN, ITS RADIOLOGICAL HAZARD IN CERTAIN CORROSION PROCESSES, GUIDE FOR LIMITING ITS RELEASE, MOVEMENT IN ECOLOGICAL SYSTEM, TRANSFER FROM METHANE TO VEGETATION, BEHAVIOR IN THE SOIL INCLUDING FORCED

082301 *CONTINUED*
EXCHANGE WITH CLAYS AND A DYNAMIC MODEL OF WATER MOVEMENT IN SOIL UNDER VARIOUS CLIMATOLOGICAL.

DOSE + GUIDE + *OCEAN AND SEA + REGULATION + *ATMOSPHERIC POLLUTION + WATER + *POPULATION EXPOSURE + *HAZARDS ANALYSIS + ION EXCHANGE + MINERAL EXCHANGE + SOIL + RADIOACTIVITY RELEASE + *ENVIRONMENT + WATER VAPOR + GAS + MODEL + BEHAVIOR + VEGETATION + CONCENTRATION + FOOD CHAIN + ECOSYSTEM + TRANSPORT + MAN + VAPOR EXCHANGE + HPIS

082320
EISENBUD M
FALLOUT FROM NUCLEAR EXPLOSIONS. II. WORLDWIDE EFFECT
NEW YORK UNIVERSITY MEDICAL CENTER, NEW YORK
37 PAGES, PP. 354-391 OF 'ENVIRONMENTAL RADIOACTIVITY', PUBLISHED BY ACADEMIC PRESS, INC., 1973 (BOOK)

THE BEHAVIOR OF THE RADIOACTIVE DUST THAT REMAINS AIRBORNE FOR MORE THAN A FEW HOURS AFTER A NUCLEAR EXPLOSION DEPENDS ON WHETHER THE MATERIAL IS CONTAINED IN THE STRATOSPHERE OR THE TROPOSPHERE, THE LATTER COMPONENT BEING DEPOSITED WITHIN A MATTER OF WEEKS AFTER THE EXPLOSION, WHEREAS THE STRATOSPHERIC COMPONENT REMAINS IN THE UPPER ATMOSPHERE FOR MANY MONTHS AND MAY BE DEPOSITED FROM POLE TO POLE.

CESIUM + DEPOSITION + *ATMOSPHERIC DIFFUSION, GLOBAL + ELEMENTS AND ISOTOPES + *FALLOUT + *STRATOSPHERE + STRONTIUM + *TEST, WEAPONS + WATER, DRINKING + *NUCLEAR DETONATION + DOSE CALCULATION, EXTERNAL + NUCLEAR EXPLOSION DEBRIS + PRECIPITATION + *RADIOACTIVITY RELEASE + *METEOROLOGY + TROPOSPHERE + *MILITARY CONSIDERATION + CONCENTRATION + BONE + *METABOLIC KINETICS + FOOD + HPIS

082780
ROHWER PS
RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON-85
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-730503-3 +. 16 PAGES, PAPER PRESENTED AT THE SYMPOSIUM ON ENVIRONMENTAL BEHAVIOR OF RADIONUCLIDES RELEASED IN THE NUCLEAR INDUSTRY, AIX-EN PROVINCE, FRANCE, MAY 14, 1973

TRITIUM (HTO) AND KR-85 ARE EXPECTED TO CONTINUE AS PROMINENT COMPONENTS OF THE RADIOACTIVE EFFLUENTS FROM NUCLEAR FACILITIES. SIMPLE COMPARISON OF AIR CONCENTRATIONS OF HTO AND KR-85 WITH THEIR RESPECTIVE MAXIMUM PERMISSIBLE CONCENTRATIONS DOES NOT PROVIDE A GOOD INDICATION OF THEIR RELATIVE RADIOLOGICAL IMPORTANCE. DETAILED CONSIDERATIONS FOR EACH RADIONUCLIDE EMPHASIZE DIFFERENCES WHICH INFLUENCE RADIOTOXICITY. DOSE ESTIMATES ARE PRESENTED, AND THE ASSOCIATED RISKS ARE COMPARED FOR EQUAL RADIONUCLIDE CONCENTRATION IN AIR: SOMATIC RISK (HTO ABOUT 10X KR-85) AND GENETIC RISK (HTO ABOUT 50X KR-85). FOR POPULATIONS IN CLOSE PROXIMITY TO THE FACILITY, H-3 WILL PROBABLY BE THE MOST SIGNIFICANT DOSE CONTRIBUTOR IF NEARLY EQUAL QUANTITIES OF THE TWO RADIONUCLIDES ARE RELEASED. IT IS PREDICTED THAT KR-85 WILL CONTRIBUTE THE GREATER DOSE TO THE GLOBAL POPULATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*KRYPTON + *ATMOSPHERIC POLLUTION + *POPULATION EXPOSURE + CONTAMINATION + SOIL + *RADIOACTIVITY RELEASE + WATER POLLUTION + CONCENTRATION + COMPARISON + *INDUSTRY, NUCLEAR

082858
WETHINGTON JA
AN INVESTIGATION OF TRITIUM DECONTAMINATION
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
UCID-15985 +. 14 PAGES, 1 TABLE, 2 FIGURES, 12 REFERENCES, JANUARY 18, 1972

PRESENT RESULTS SHOW THAT LIQUID HTO CAN BE PARTIALLY DECONTAMINATED BY ROOM TEMPERATURE CONTACT WITH CERTAIN ROCKS; HOWEVER, THESE NUMBERS ARE ONLY GOOD FOR QUALITATIVE PREDICTIONS. A VERY LIMITED NUMBER OF EXPERIMENTS INDICATE THAT THESE RESULTS CAN BE EXTRAPOLATED TO THE EXTREME CONDITIONS OF TEMPERATURE AND PRESSURE FOUND IN THE CHIMNEY OF A NUCLEAR STIMULATED WELL. PREPARED CATALYSTS CAN BE USED TO INDUCE EXCHANGE OF T BETWEEN HTO AND CH4 IN THE RANGE 14.7 TO 3000 PSIA. TEMPERATURES OF 100-300 C WERE EMPLOYED IN ALL CASES. ATTEMPTS TO EMPLOY VAPOR-GAS OR LIQUID-GAS REACTIONS WITHOUT ADDED SOLIDS WERE UNSUCCESSFUL. DETAILS OF THE SOLID'S PARTICIPATION IN THESE EXCHANGE REACTIONS NEEDS FURTHER CLARIFICATION.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CHEMICAL REACTION + *DECONTAMINATION + HYDROGEN + *HIGH TEMPERATURE + CATALYST

082903
HAKONSON TE + NYHAN JW + JOHNSON LJ
ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31, 1972
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5282-MS +. 47 PAGES, 17 TABLES, 17 FIGURES, 56 REFERENCES, MAY 1973

LIQUID-WASTE-DISPOSAL-AREA HISTORY IS SUMMARIZED, INCLUDING ACCUMULATIVE PU. MOST BIOTA HAD TRITIUM LESS THAN THE EFFLUENT WATER; HOWEVER HONEYBEES HAD AS MUCH AS TWO ORDERS OF MAGNITUDE HIGHER LEVELS, APPARENTLY FROM THE FORAGING OF THE BEES ON CLOVER GROWING NEAR DISPOSAL PITS. THERE WAS ALSO EVIDENCE OF UPTAKE OF CS-137 AND PU BY BIOTA IN AN AREA WITHIN ABOUT 2500 METERS

082903 *CONTINUED*
OF THE WASTE OUTFALLS; HOWEVER MOST CS-137 REMAINED IN STREAM CHANNEL ALLUVIUM. THE ROLE OF EFFLUENT PH IN MEDIATING CS-137 AND PU TRANSPORT WILL BE STUDIED. RADIONUCLIDES ARE BEING DETERMINED IN SOILS AND BIOTA IN THE VICINITY OF THE 1945 TRINITY SHOT NEAR ALAMAGORDO, NEW MEXICO.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + EFFLUENT + PLUTONIUM + SURVEY, ENVIRONMENT + *WASTE DISPOSAL, TERRESTRIAL + NUCLEAR DETONATION + *LASL + CRITICAL NUCLIDE PATHWAY + *RADIONUCLIDE UPTAKE + VEGETATION + FIELD EXPERIMENT + INSECT + EFFECT, PH + MAMMAL, RODENT

083190
PURTYMUN WD
UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE SHAFTS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5286-MS +. 7 PAGES, 4 TABLES, 4 FIGURES, MAY 1973

TRITIUM FROM CONTAMINATED WASTES PLACED IN STORAGE SHAFTS HAS BEEN TRANSPORTED BY MOISTURE INTO THE ADJACENT TUFF. A STUDY MADE TO DETERMINE THE EXTENT AND GEOLOGIC FACTORS GOVERNING THIS MOVEMENT INDICATES THAT 100 PCI/ML LEVELS HAVE MOVED WESTWARD A DISTANCE OF 105 FT IN 4 YR. MAJOR MOVEMENT HAS BEEN ALONG THE CONTACT BETWEEN THE TWO ASHFLOWS PENETRATED BY THE SHAFTS, WITH SECONDARY TRANSPORT THROUGH OPEN JOINTS AND THROUGH THE TUFF MATRIX. EVAPORATION FROM SURFACE SOIL AND TUFF AND TRANSPIRATION FROM PLANTS HAS BEEN A CONTRIBUTING FACTOR IN THE RELEASE OF TRITIUM TO THE ATMOSPHERE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GEOLOGY + *SURFACE CONTAMINATION + *ATMOSPHERIC POLLUTION + WASTE STORAGE + *SOIL, NUCLIDE OCCURRENCE + EVAPORATION + RADIOACTIVITY RELEASE + *WATER VAPOR + ROCK MECHANICS + *TRANSPORT + *TRANSPIRATION

100297
KOVALENKO AE + TIMASHEV AP + EGURNOV VY
THE LIQUID-VAPOR SEPARATION FACTOR OF DILUTE SOLUTIONS OF DTO IN D2O
3 PAGES, 2 FIGURES, 14 REFERENCES, SOVIET ATOMIC ENERGY, 36(5), PP. 501-503 (NOVEMBER 1974)

IN THIS ARTICLE, WHICH IS A CONTINUATION OF OUR PREVIOUS MEASUREMENTS OF THE LIQUID-VAPOR SEPARATION FACTOR OF DILUTE SOLUTIONS OF HTO IN H2O, THE RESULTS OF AN EXPERIMENTAL DETERMINATION OF THE SEPARATION FACTOR OF HYDROGEN ISOTOPES IN RECTIFICATION OF DILUTE SOLUTIONS OF DTO IN D2O AT 50-100 C ARE DESCRIBED.

*HEAVY WATER + CONTAMINATION + *COOLANT QUALITY

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

ABSORPTION
061721 P 27 070396 P 33 074536 P 35
ACCIDENT, DESIGN BASIS
064776 P 28
ACCIDENT, HYPOTHETICAL
043361 P 19
ACTIVATION
047066 P 20 072235 P 33 075494 P 36
ACTIVATION PRODUCT
007456 P 2 008686 P 3 036855 P 15
ACTIVITY BUILDUP
064035 P 28
ADMINISTRATIVE CONTROL
036855 P 15
ADSORPTION
009164 P 3 043090 P 17 077835 P 38
AECL
052042 P 23
AEROSOL
025597 P 11
AEROSOL, RADIOACTIVE
060857 P 26
AGENCY, AEC
025597 P 11 065420 P 30
AGRICULTURE
045087 P 20
AIR
013712 P 5 023879 P 11 050988 P 21 052042 P 23
067088 P 31 079242 P 39
AIRBORNE RELEASE
007341 P 2 030457 P 13 030475 P 13 055111 P 24
064776 P 28
AIRCRAFT
017816 P 9 025597 P 11 073004 P 34
ALASKA
057383 P 25 079408 P 39
ANALOG SIMULATION
079408 P 39
ANALYTICAL TECHNIQUE
013347 P 5 013795 P 5 016975 P 8 017268 P 8
023879 P 11 036855 P 15 040000 P 16 055111 P 24
055973 P 24 059243 P 25 072235 P 33 073004 P 34
ANIMAL
036248 P 15 069508 P 33
ANIMAL, AMPHIBIAN
039157 P 16 040781 P 16
ANIMAL, FISH
064789 P 29 065107 P 29 065109 P 29 066272 P 30
072235 P 33 075309 P 36 079324 P 39
ANIMAL, INVERTEBRATE
036248 P 15
ANIMAL, VERTEBRATE
036248 P 15 064776 P 28 064781 P 28 064789 P 29
067088 P 31
AQUATIC ORGANISM
072235 P 33 079324 P 39
ASSIMILATION
048899 P 21
ATMOSPHERIC CHEMISTRY
030682 P 14
ATMOSPHERIC CIRCULATION, GLOBAL
008303 P 2 013282 P 4 013283 P 4 013798 P 6
060477 P 26 075112 P 35
ATMOSPHERIC DIFFUSION
030108 P 13 042995 P 17
ATMOSPHERIC DIFFUSION EXPERIMENT
007341 P 2 061104 P 26 061201 P 26 074336 P 35
ATMOSPHERIC DIFFUSION, CLIMATOLOGY
025597 P 11 030457 P 13 030475 P 13
ATMOSPHERIC DIFFUSION, GLOBAL
008303 P 2 025597 P 11 028902 P 12 032094 P 14
043099 P 18 082320 P 41
ATMOSPHERIC POLLUTION
017816 P 9 030457 P 13 030475 P 13 030682 P 14
033922 P 14 042995 P 17 043099 P 18 043102 P 18
043106 P 18 043361 P 19 051298 P 22 053552 P 23
064036 P 28 069396 P 33 075112 P 35 075576 P 37
076899 P 37 076901 P 38 077835 P 38 082301 P 40
082780 P 41 083190 P 42
ATMOSPHERIC STABILITY
025597 P 11
BATTELLE NORTHWEST
065087 P 29 075246 P 36
BEHAVIOR
037402 P 15 082301 P 40
BELGIUM
064781 P 28
BENEFIT VS RISK
067088 P 31 072960 P 34
BETA EMITTER
036855 P 15 069396 P 33
BIBLIOGRAPHY
057579 P 25 062726 P 27 067088 P 31 068619 P 32
075246 P 36
BIOACCUMULATION/TURNOVER
036248 P 15 047066 P 20 055002 P 24 057579 P 25
061130 P 26 065109 P 29 066272 P 30 068619 P 32
069508 P 33 072235 P 33 075491 P 36 075576 P 37
BIOLOGICAL CONTROL
069396 P 33 077191 P 38
BIOLOGICAL HALF-LIFE
043102 P 18
BIOMASS
042853 P 17 047066 P 20 064789 P 29
BIOMEDICAL
023154 P 10 055111 P 24 066272 P 30
BODY FLUID
067088 P 31
BONE
082320 P 41
BONE, MARROW
061130 P 26
BROMINE
075494 P 36
CADMIUM
025597 P 11
CALCIUM
015304 P 8
CALVERT CLIFFS 1 (PWR)
038641 P 15 044109 P 19 065420 P 30
CALVERT CLIFFS 2 (PWR)
038641 P 15
CANADA
030108 P 13 054494 P 24 059243 P 25 064776 P 28
CANAL
053772 P 23 053779 P 23
CARBON
007456 P 2 008303 P 2 013712 P 5 013797 P 5
013798 P 6 025597 P 11 040781 P 16 043099 P 18
043102 P 18 043106 P 18 052495 P 23 064789 P 29
CATALYST
082858 P 41
CERIUM
025597 P 11 051130 P 21 061130 P 26
CESIUM
004811 P 1 007132 P 1 007456 P 2 008330 P 3
008686 P 3 013818 P 8 023297 P 10 025597 P 11
036248 P 15 048899 P 21 051130 P 21 061130 P 26
065087 P 29 065107 P 29 065109 P 29 065420 P 30
069036 P 32 075309 P 36 075491 P 36 077945 P 38
079324 P 39 082320 P 41 082903 P 41
CHALK RIVER
066272 P 30 072235 P 33 077945 P 38
CHARCOAL ADSORBER
019263 P 9
CHEMICAL ANALYSIS
023879 P 11
CHEMICAL KINETICS
030682 P 14 051222 P 22 064035 P 28
CHEMICAL REACTION
030682 P 14 082858 P 41
CHESAPEAKE BAY
065420 P 30
CHLORIDE
027025 P 12
CHLORINE
007132 P 1
CHROMATOGRAPHY
007132 P 1 030129 P 13
CLOUD

076901 P 38 080611 P 40
COBALT
007456 P 2 065420 P 30 072235 P 33 075309 P 36
077945 P 38 079324 P 39
CODES AND STANDARDS
064776 P 28 067891 P 31
COMMUNITY, PLANT
064789 P 29
COMPARISON
065163 P 30 075112 P 35 082780 P 41
COMPARISON, THEORY AND EXPERIENCE
047066 P 20 074336 P 35
COMPARTMENT
047066 P 20 053779 P 23
COMPUTER PROGRAM, DIGITAL
036248 P 15 047066 P 20
CONCENTRATION
028688 P 12 036413 P 15 040777 P 16 040781 P 16
042853 P 17 043087 P 17 043090 P 17 043102 P 18
043106 P 18 043361 P 19 047170 P 20 047270 P 21
051272 P 22 055973 P 24 061927 P 27 064035 P 28
064789 P 29 065163 P 30 067891 P 31 068583 P 31
070396 P 33 072304 P 34 072991 P 34 073740 P 35
074536 P 35 076284 P 37 076284 P 37 076899 P 37
076901 P 38 079324 P 39 080611 P 40 081445 P 40
082301 P 40 082320 P 41 082780 P 41
CONCENTRATION FACTOR
039157 P 16 047066 P 20 072235 P 33
CONCENTRATION, AREA
023879 P 11
CONCENTRATION, GROUND LEVEL
022972 P 10 061104 P 26
CONCENTRATION, MAXIMUM
061201 P 26 075309 P 36
CONCENTRATION, PEAK TO AVERAGE
036413 P 15
CONDENSATION
030108 P 13 030129 P 13
CONSUMER PRODUCT
063371 P 27 064781 P 28
CONTAINMENT
077191 P 38
CONTAINMENT ANALYSIS
079408 P 39
CONTAMINATION
007620 P 2 042995 P 17 043361 P 19 061927 P 27
065163 P 30 072991 P 34 074536 P 35 082780 P 41
100297 P 42
COOLANT QUALITY
100297 P 42
CORRELATION
045087 P 20 064035 P 28
COSMIC RADIATION
025597 P 11 030108 P 13
COUNTER
013347 P 5 013795 P 5 016975 P 8 017268 P 8
036855 P 15 076284 P 37 076284 P 37
CRITICAL NUCLIDE
070396 P 33
CRITICAL NUCLIDE PATHWAY
036248 P 15 047066 P 20 068619 P 32 068694 P 32
069036 P 32 069508 P 33 070396 P 33 075309 P 36
075491 P 36 075576 P 37 075733 P 37 077945 P 38
079408 P 39 082903 P 41
CROSS SECTION
076284 P 37 076284 P 37
CRUSTACEAN
004811 P 1 013818 P 8 017268 P 8 023154 P 10
043102 P 18
CRYSTAL RIVER 3 (PWR)
065109 P 29
CYCLING
040777 P 16 042853 P 17
DATA COLLECTION
065420 P 30 077191 P 38
DECONTAMINATION
042995 P 17 063371 P 27 078450 P 39 081445 P 40
082858 P 41
DEPOSITION
007341 P 2 023879 P 11 027023 P 11 028902 P 12
030108 P 13 030129 P 13 061927 P 27 076284 P 37
076284 P 37 077835 P 38 080611 P 40 082320 P 41
DESORPTION
073740 P 35 079242 P 39
DESTRUCTIVE WIND
065087 P 29
DEUTERIUM
013283 P 4 019263 P 9 027078 P 12 030108 P 13
030475 P 13
DIETARY HABIT
023154 P 10 068619 P 32 075309 P 36
DIFFUSION
006736 P 1 007341 P 2 027078 P 12 030129 P 13
043361 P 19 051562 P 22 051569 P 22 051578 P 22
051840 P 23 053552 P 23
DILUTION
006736 P 1 013801 P 6 013802 P 6 022972 P 10
030129 P 13 033090 P 14 044832 P 19 048899 P 21
052042 P 23 064035 P 28 064036 P 28 069508 P 33
079408 P 39 081445 P 40
DISPERSION
006736 P 1 007132 P 1 009164 P 3 013801 P 6
013802 P 6 013804 P 7 015304 P 8 027025 P 12
030108 P 13 030129 P 13 033384 P 14 048899 P 21
051130 P 21
DISTRIBUTION
040777 P 16 042853 P 17 045087 P 20 051578 P 22
072960 P 34 075733 P 37 076284 P 37 076284 P 37
DNA
067088 P 31
DOSE
017268 P 8 053552 P 23 061927 P 27 070396 P 33
082301 P 40
DOSE CALCULATION, EXTERNAL
043361 P 19 068619 P 32 069396 P 33 080611 P 40
082320 P 41
DOSE CALCULATION, INTERNAL
043361 P 19 061130 P 26 064776 P 28 067088 P 31
068619 P 32 068694 P 32 069508 P 33 075309 P 36
DOSIMETRY
013818 P 8 066272 P 30
DOSIMETRY, THERMOLUMINESCENCE
066272 P 30
DURATION, GENERATION
064789 P 29
DURATION, LONG
075494 P 36
DURATION, SHORT
075494 P 36
ECOLOGY
004811 P 1 013818 P 8 017268 P 8 021312 P 9
023154 P 10 027023 P 11 028688 P 12 030108 P 13
036248 P 15 036413 P 15 037402 P 15 038641 P 15
039157 P 16 043099 P 18 044471 P 19 053417 P 23
070396 P 33 075576 P 37
ECOSYSTEM
036248 P 15 051169 P 21 056628 P 25 058730 P 25
065087 P 29 065109 P 29 069508 P 33 079324 P 39
082301 P 40
ECOSYSTEM, AQUATIC
065087 P 29 065107 P 29 066272 P 30 069508 P 33
072235 P 33 075491 P 36 075576 P 37 077945 P 38
ECOSYSTEM, ARCTIC
065087 P 29
ECOSYSTEM, DESERT
065087 P 29
ECOSYSTEM, ESTUARINE
047066 P 20 065109 P 29 075576 P 37
ECOSYSTEM, FOREST
036248 P 15 042853 P 17 051276 P 22 053779 P 23
056628 P 25 075491 P 36
ECOSYSTEM, GRASSLAND
064781 P 28 065087 P 29 065163 P 30
ECOSYSTEM, MARINE
047066 P 20 065109 P 29 075576 P 37
ECOSYSTEM, MODEL
036248 P 15 047066 P 20 068619 P 32 075309 P 36
075491 P 36 075576 P 37
ECOSYSTEM, TROPICAL
042853 P 17 056628 P 25 058730 P 25 069396 P 33
075491 P 36
EFFECT
051298 P 22
EFFECT, GENETIC
065420 P 30 066272 P 30 067088 P 31
EFFECT, PH
047066 P 20 082903 P 41
EFFECT, SOMATIC
065420 P 30 066272 P 30
EFFLUENT
004950 P 1 022972 P 10 033384 P 14 044471 P 19
066272 P 30 067891 P 31 077191 P 38 078450 P 39
082903 P 41
ELECTROSTATIC CHARGE
030682 P 14
ELEMENTS AND ISOTOPES
042853 P 17 051222 P 22 054493 P 24 064035 P 28
077835 P 38 079324 P 39 082320 P 41
ELIMINATION
043154 P 18
ENVIRONMENT
030129 P 13 036855 P 15 037402 P 15 040781 P 16

044378 P 19 054493 P 24 062726 P 27 067088 P 31
069396 P 33 072235 P 33 072991 P 34 075112 P 35
075246 P 36 075576 P 37 077191 P 38 082301 P 40
ENVIRONMENTAL CONTROL MEASURE
044109 P 19 065109 P 29 069508 P 33
EQUATION
043272 P 18
EQUILIBRIUM
061927 P 27
EQUIPMENT DEVELOPMENT
051840 P 23
ESTUARY
047066 P 20
EURATOM
075309 P 36 075576 P 37
EVAPORATION
027023 P 11 030108 P 13 030129 P 13 037402 P 15
042853 P 17 043087 P 17 045087 P 20 051169 P 21
059243 P 25 083190 P 42
EXCAVATION, NUCLEAR
021317 P 9
EXCRETION
043154 P 18
EXPERIMENT
022972 P 10 027025 P 12 036413 P 15 043154 P 19
EXPLOSION
051578 P 22
EXPOSURE, ACUTE
067088 P 31
EXPOSURE, BACKGROUND
064789 P 29
EXPOSURE, CHRONIC
064781 P 28 067088 P 31
FALLOUT
007620 P 2 008303 P 2 013282 P 4 013283 P 4
013712 P 5 013798 P 6 013803 P 7 017816 P 9
020442 P 9 025597 P 11 028902 P 12 032094 P 14
033090 P 14 039157 P 16 040777 P 16 042853 P 17
043087 P 17 048899 P 21 050670 P 21 056628 P 25
060477 P 26 060857 P 26 061130 P 26 064035 P 28
064789 P 29 065107 P 29 065109 P 29 068114 P 31
069036 P 32 069508 P 33 072991 P 34 075112 P 35
077835 P 38 079324 P 39 082320 P 41
FIELD EXPERIMENT
051169 P 21 072235 P 33 075309 P 36 082903 P 41
FIRE
065087 P 29
FISSION PRODUCT RELEASE
013251 P 4 013458 P 5 044109 P 19 044378 P 19
065420 P 30 072991 P 34
FISSION PRODUCT TRANSPORT
007341 P 2 009164 P 3 072991 P 34
FISSION PRODUCT, IODINE
007341 P 2
FLOOD
051130 P 21 072304 P 34
FLOODING COEFFICIENT
072304 P 34
FLOW
072304 P 34
FOOD
070396 P 33 079324 P 39 082320 P 41
FOOD CHAIN
036248 P 15 044109 P 19 044471 P 19 047066 P 20
061721 P 27 061927 P 27 064776 P 28 064781 P 28
065087 P 29 065109 P 29 068619 P 32 070396 P 33
074536 P 35 075309 P 36 075491 P 36 075576 P 37
079324 P 39 082301 P 40
FOOD INTAKE
064781 P 28 064789 P 29
FORECAST
075576 P 37
FRANCE
033922 P 14
FUEL REPROCESSING
030129 P 13 077835 P 38
FUEL, FOSSIL
055002 P 24
GAMMA
013818 P 8
GAMMA EMITTER
047066 P 20
GAS
050988 P 21 060857 P 26 062371 P 27 064035 P 28
068694 P 32 073740 P 35 076901 P 38 078450 P 39
079242 P 39 082301 P 40
GEOLOGY
007620 P 2 008330 P 3 008686 P 3 009164 P 3
017272 P 9 021824 P 10 023297 P 10 027021 P 11
040000 P 16 040040 P 16 043090 P 17 065420 P 30
078450 P 39 083190 P 42
GEOLOGY, GEOCHEMICAL
008330 P 3 017272 P 9 064035 P 28
GEOLOGY, GEOPHYSICAL
008330 P 3 011784 P 3 017272 P 9
GEOLOGY, STRATIGRAPHY
021824 P 10
GERMANY
013347 P 5 013795 P 5 030475 P 13
GROUND WATER
003488 P 1 004950 P 1 008330 P 3 030129 P 13
040000 P 16 043099 P 18 053221 P 23 059243 P 25
072304 P 34 081445 P 40
GROUND WATER, NUCLIDE OCCURRENCE
007456 P 2 007620 P 2 008330 P 3 008686 P 3
009164 P 3 012287 P 4 017272 P 9 021824 P 10
030108 P 13 043087 P 17 043090 P 17 055973 P 24
068114 P 31 068583 P 31 069508 P 33 075733 P 37
077945 P 38 079408 P 39
GROUND WATER, PROPERTY
008330 P 3 009164 P 3 017272 P 9 075733 P 37
GROUND WATER, TRACER
007132 P 1 009164 P 3 011784 P 3 015304 P 8
068114 P 31 072304 P 34 075733 P 37
GUIDE
036855 P 15 043090 P 17 072960 P 34 082301 P 40
HANFORD SITE
021824 P 10 068583 P 31
HAZARD, RELATIVE
033922 P 14 036855 P 15 057579 P 25 067088 P 31
068619 P 32 069396 P 33 077191 P 38
HAZARDS ANALYSIS
064781 P 28 072960 P 34 082301 P 40
HEAVY WATER
043154 P 18 043272 P 18 100297 P 42
HIGH TEMPERATURE
082858 P 41
HPIS
077191 P 38 082301 P 40 082320 P 41
HUMBOLDT BAY (BWR)
047066 P 20
HYDRAULIC ANALYSIS
006736 P 1
HYDRAULIC EXPERIMENT
006736 P 1
HYDROGEN
019263 P 9 023154 P 10 030108 P 13 053779 P 23
067088 P 31 076901 P 38 082858 P 41
HYDROLOGY
007132 P 1 007456 P 2 007620 P 2 008330 P 3
008686 P 3 009164 P 3 012287 P 4 013802 P 6
013803 P 7 013805 P 7 016975 P 8 017272 P 9
023297 P 10 027021 P 11 027078 P 12 030129 P 13
036413 P 15 037402 P 15 040000 P 16 043087 P 17
043090 P 17 043099 P 18 044832 P 19 057383 P 25
059243 P 25 064035 P 28 064036 P 28 065420 P 30
072304 P 34 075494 P 36
HYDROLOGY, RATE OF MOVEMENT
007456 P 2 007620 P 2 008686 P 3 009164 P 3
011784 P 3 012287 P 4 013802 P 6 013804 P 7
015304 P 8 017272 P 9 064035 P 28 075494 P 36
075733 P 37 079408 P 39
ICRP
033922 P 14 064776 P 28 067088 P 31
IMPOUNDMENT
075494 P 36
INDIA
020442 P 9 022972 P 10
INDUSTRY, NUCLEAR
082780 P 41
INFANT
064776 P 28
INGESTION
036855 P 15 064781 P 28 065163 P 30 067088 P 31
068619 P 32 068694 P 32 070396 P 33
INHALATION
061721 P 27 067088 P 31 068694 P 32 070396 P 33
INSECT
036248 P 15 077945 P 38 082903 P 41
INSTRUMENT, AIR SAMPLING
008303 P 2 074336 P 35
INSTRUMENTS, MISC.
051171 P 22 077945 P 38
IODINE
007341 P 2 023297 P 10 075494 P 36 077945 P 38
079324 P 39
ION EXCHANGE
007132 P 1 015304 P 8 027025 P 12 027078 P 12
043099 P 18 051130 P 21 051840 P 23 075494 P 36
075733 P 37 082301 P 40
IRON
075309 P 36 077945 P 38

ISOCHEM, INC.
021824 P 10
ISOTOPIC FRACTIONATION
013712 P 5 030108 P 13
ITALY
075309 P 36
JACOBS
030129 P 13
JAPAN
047170 P 20 047270 P 21
KRYPTON
025597 P 11 043102 P 18 044471 P 19 063371 P 27
072960 P 34 075494 P 36 077835 P 38 082780 P 41
LAKE
033090 P 14 040777 P 16 057579 P 25 059243 P 25
064035 P 28 064036 P 28 066272 P 30 072235 P 33
077945 P 38
LAKE CAYUGA
065107 P 29
LAKE MICHIGAN
048899 P 21
LANTHANUM
069036 P 32
LAPSE RATE, ADIABATIC, NEUTRAL
061104 P 26
LASL
081445 P 40 082903 P 41
LAYER
053760 P 23
LIQUID
036855 P 15 051569 P 22
LIVESTOCK
061721 P 27
MAMMAL, COW
064781 P 28 065163 P 30
MAMMAL, RODENT
082903 P 41
MAMMAL, SMALL
036248 P 15
MAN
061721 P 27 061927 P 27 064776 P 28 066272 P 30
067088 P 31 068619 P 32 075246 P 36 082301 P 40
MANGANESE
075309 P 36
MATERIAL BALANCE
072304 P 34
MATHEMATICAL STUDY
015304 P 8 045485 P 20
MATHEMATICAL TREATMENT
043272 P 18 047066 P 20
MATHEMATICS
053779 P 23
MATURE
064776 P 28 067088 P 31
MEASUREMENT
040000 P 16 043087 P 17 043102 P 18 043106 P 18
072304 P 34 072991 P 34 075112 P 35 077191 P 38
080611 P 40
MESOSPHERE
025597 P 11
METABOLIC KINETICS
082320 P 41
METAL
036248 P 15
METEOROLOGICAL SUPPORT
040040 P 16
METEOROLOGY
013712 P 5 013800 P 6 016975 P 8 017816 P 9
040040 P 16 047170 P 20 047270 P 21 065420 P 30
069036 P 32 075112 P 35 077945 P 38 079242 P 39
080611 P 40 082320 P 41
MILITARY CONSIDERATION
082320 P 41
MILK
061721 P 27 064776 P 28 064781 P 28 065163 P 30
070396 P 33 075309 P 36
MINERAL CYCLING
036248 P 15
MINERAL EXCHANGE
007132 P 1 007456 P 2 007620 P 2 013805 P 7
015304 P 8 021824 P 10 082301 P 40
MIXING DEPTH
069036 P 32 076284 P 37 076284 P 37
MODEL
053779 P 23 070396 P 33 082301 P 40
MODEL TESTING
036413 P 15 044832 P 19 061927 P 27
MODEL, BIOLOGICAL
067088 P 31
MODEL, DETERMINISTIC
075576 P 37 076284 P 37 076284 P 37
MOLLUSC
065109 P 29
MONITOR
075112 P 35
MONITOR, AIR
055111 P 24 073004 P 34
MONITOR, AREA
043090 P 17 068583 P 31 081445 P 40
MONITOR, BACKGROUND
044832 P 19 075733 P 37
MONITOR, ENVIRONMENTAL
043099 P 18 055973 P 24 064781 P 28 065109 P 29
067891 P 31 073004 P 34 077191 P 38
MONITOR, GROUND SURFACE
055973 P 24 073004 P 34
MONITOR, LIQUID
004811 P 1 006736 P 1 055111 P 24 068583 P 31
077945 P 38
MONITOR, NUCLEAR DETONATION
064789 P 29
MONITORING PROGRAM, ENVIRONMENTAL
066272 P 30 077945 P 38
MONITORING SYSTEM, RADIATION
055111 P 24 073004 P 34
MPBB
064776 P 28 067088 P 31
MPC
007456 P 2 033922 P 14 048899 P 21 064776 P 28
067088 P 31 072960 P 34
N-POWER, SAFETY OF
044109 P 19 044378 P 19 065420 P 30
NCRP
067088 P 31
NEUTRON
013818 P 8
NEVADA TEST SITE
045087 P 20 055002 P 24 075733 P 37
NEW ZEALAND
032094 P 14 051171 P 22
NIOBIUM
023297 P 10 069036 P 32
NOBLE GAS
075576 P 37
NRC QUESTION
038641 P 15
NRTS
008330 P 3 012287 P 4 017272 P 9 023297 P 10
NUCLEAR DETONATION
007456 P 2 008303 P 2 008686 P 3 009164 P 3
011794 P 3 013712 P 5 023154 P 10 030108 P 13
033090 P 14 040781 P 16 045087 P 20 063371 P 27
076899 P 37 076901 P 38 077191 P 38 078450 P 39
081106 P 40 082320 P 41 082903 P 41
NUCLEAR EXPLOSION DEBRIS
028902 P 12 079408 P 39 082320 P 41
OCEAN AND SEA
013801 P 6 030108 P 13 030129 P 13 044832 P 19
051171 P 22 051272 P 22 051298 P 22 057495 P 23
053760 P 23 057579 P 25 064036 P 28 069036 P 32
075112 P 35 076284 P 37 076284 P 37 076899 P 37
079324 P 39 079408 P 39 082301 P 40
OCEAN, PACIFIC
051171 P 22 053760 P 23 064789 P 29 067891 P 31
OFF GAS
033384 P 14
OFF SITE
033384 P 14
OPPONENT
044378 P 19
ORGANIC
064781 P 28 065163 P 30 069508 P 33
ORGANIZATION, INTERNATIONAL
075576 P 37
ORNL
036248 P 15
OXIDATION
062726 P 27 081106 P 40
OXIDE
064776 P 28 067088 P 31
OXYGEN
013283 P 4 027078 P 12 065109 P 29
OZONE
008303 P 2
PARTICLE SIZE
008303 P 2 013712 P 5
PATENT
081106 P 40
PERSONNEL EXPOSURE, RADIATION
042995 P 17 067088 P 31
PHOSPHATE
077945 P 38

PHYSIOLOGY/METABOLISM
064776 P 28 064781 P 28 064789 P 29 066272 P 30
067088 P 31 072235 P 33
PHYTOPLANKTON
065109 P 29
PLACENTAL TRANSFER
065163 P 30
PLANT
043154 P 18 045087 P 20 058730 P 25
PLANT, ALGAE/FUNGI
065109 P 29 075491 P 36 079324 P 39
PLANT, SEEDLING
065087 P 29
PLANT, SPERMATOPHYTE
043102 P 18 043106 P 18 055002 P 24 065109 P 29
075491 P 36
PLASTICS
066272 P 30
PLOWSHARE
007456 P 2 021312 P 9 044832 P 19 051130 P 21
051578 P 22 051840 P 23 053772 P 23 063371 P 27
064781 P 28 068694 P 32 077191 P 38
PLUME BEHAVIOR
055002 P 24
PLUTONIUM
036248 P 15 075309 P 36 082903 P 41
POLLUTION
075576 P 37
POPULATION EXPOSURE
030129 P 13 036855 P 15 038641 P 15 043361 P 19
061130 P 26 063371 P 27 064776 P 28 064781 P 28
064789 P 29 065420 P 30 066272 P 30 067088 P 31
074536 P 35 079324 P 39 082301 P 40 082780 P 41
POTASSIUM
065107 P 29
PRECIPITATION
013800 P 6 013803 P 7 020442 P 9 030108 P 13
032094 P 14 033090 P 14 037402 P 15 042853 P 17
043102 P 18 045087 P 20 045485 P 20 050670 P 21
051272 P 22 051298 P 22 051432 P 22 052042 P 23
053779 P 23 054494 P 24 054496 P 24 060857 P 26
061927 P 27 064036 P 28 073740 P 35 075112 P 35
076899 P 37 079242 P 39 080611 P 40 082320 P 41
PRODUCTION
077191 P 38
PRODUCTION, RATE
064781 P 28
PROPONENT
044109 P 19 044378 P 19
PROTEIN
064781 P 28
PUBLIC HEARING
044378 P 19
PUBLIC RELATIONS
044378 P 19
PUERTO RICO
036413 P 15 042853 P 17 058730 P 25 075491 P 36
R AND D PROGRAM
043087 P 17
RADIATION DAMAGE
013818 P 8
RADIATION EFFECT
013818 P 8 017268 P 8 036248 P 15 065087 P 29
065420 P 30 075246 P 36 077191 P 38
RADIATION EFFECT, ECOSYSTEM
064789 P 29 075491 P 36
RADIATION EXPOSURE
075246 P 36
RADIATION EXPOSURE, ACUTE
070396 P 33
RADIATION EXPOSURE, CHRONIC
066272 P 30 070396 P 33
RADIATION IN PERSPECTIVE
043361 P 19 044109 P 19 057579 P 25 068619 P 32
RADIATION MODEL
028688 P 12
RADIATION MONITORS
004811 P 1 016975 P 8 030129 P 13 042995 P 17
066272 P 30 077945 P 38
RADIATION PROFILE
042853 P 17 043154 P 18 045087 P 20 073004 P 34
RADIATION PROTECTION, CHEMICAL
013818 P 8
RADIATION SAFETY AND CONTROL
013818 P 8 017268 P 8 030129 P 13 042995 P 17
063371 P 27 065420 P 30 069396 P 33
RADIATION, PUBLIC EDUCATION
064776 P 28
RADIOACTIVITY RELEASE
007341 P 2 025597 P 11 030129 P 13 033922 P 14
037402 P 15 044109 P 19 065420 P 30 067891 P 31
068619 P 32 069396 P 33 072960 P 34 074536 P 35
077191 P 38 077835 P 38 082301 P 40 082320 P 41
082780 P 41 083190 P 42
RADIOCHEMICAL ANALYSIS
075733 P 37
RADIOISOTOPE
017268 P 8 052495 P 23 067891 P 31 068619 P 32
RADIOLOGICAL ASSISTANCE
068583 P 31
RADIOLOGY
053779 P 23
RADIONUCLIDE TRANSFER
036248 P 15 042853 P 17 047066 P 20 065163 P 30
068114 P 31 069036 P 32 069508 P 33 074536 P 35
075733 P 37 077945 P 38
RADIONUCLIDE UPTAKE
036248 P 15 043106 P 18 043154 P 18 044471 P 19
045087 P 20 047066 P 20 055002 P 24 057579 P 25
058730 P 25 061130 P 26 061721 P 27 064776 P 28
064781 P 28 064789 P 29 065087 P 29 065107 P 29
065109 P 29 066272 P 30 067088 P 31 068619 P 32
069508 P 33 072235 P 33 074536 P 35 075309 P 36
075491 P 36 075576 P 37 075733 P 37 077945 P 38
082903 P 41
RADIONUCLIDE, INDUCED
028688 P 12
RADIUM
052495 P 23 064035 P 28
RADON
008303 P 2 023879 P 11 064035 P 28
RAINOUT
008303 P 2 011784 P 3 012287 P 4 013282 P 4
013803 P 7 017816 P 9 020442 P 9 023879 P 11
028902 P 12 030108 P 13 030129 P 13 043106 P 18
051432 P 22 061721 P 27 064036 P 28 072304 P 34
073740 P 35 080611 P 40
RATE
052042 P 23
REACTOR
036855 P 15 044471 P 19 051569 P 22 052042 P 23
REACTOR POWER
044109 P 19 067891 P 31
REACTOR, LWR
064781 P 28
REACTOR, POWER
030129 P 13 044378 P 19 072991 P 34 077191 P 38
REACTOR, PWR
038641 P 15 067891 P 31
REACTOR, RESEARCH
076284 P 37 076284 P 37
REACTOR, THERMONUCLEAR
076901 P 38
RECONCENTRATION
048899 P 21
REGULATION
036855 P 15 063371 P 27 072960 P 34 082301 P 40
REGULATION, AEC
067891 P 31
REGULATION, FEDERAL
067891 P 31
REPORT, ENVIRONMENTAL
075246 P 36
RESEARCH, GOVERNMENT
065087 P 29
RESOURCE, NATURAL
055002 P 24 068694 P 32 078450 P 39
RESPIRATION
042853 P 17 043154 P 18 064776 P 28
RETENTION
076284 P 37 076284 P 37
REVIEW
053417 P 23 054493 P 24 067088 P 31 068619 P 32
069036 P 32 069508 P 33 075494 P 36
RHENIUM
052495 P 23
RHODAMINE B
006736 P 1
RHODIUM
075597 P 11
RIVER
006736 P 1 033090 P 14 051272 P 22 051569 P 22
057579 P 25 072304 P 34
RIVER, COLUMBIA
065087 P 29
RIVER, OTTAWA
072235 P 33
ROCK MECHANICS
083190 P 42
RUTHENIUM
007456 P 2 021824 P 10 051130 P 21 065420 P 30
068583 P 31 075309 P 36 075494 P 36

SAFETY EVALUATION
068583 P 31 072991 P 34
SALINITY
047066 P 20 065109 P 29
SAMPLING
008303 P 2 013797 P 5 017816 P 9 025597 P 11
040040 P 16 043102 P 18 047066 P 20 051272 P 22
061201 P 26 065109 P 29 073004 P 34 076284 P 37
076284 P 37 079324 P 39
SAMPLING, HIGH ALTITUDE
008303 P 2 055973 P 24
SAN ONOFRE 1 (PWR)
067891 P 31
SAVANNAH RIVER PLANT
027025 P 12 043090 P 17
SCANDIUM
068114 P 31
SEDIMENT
052495 P 23 065107 P 29 068114 P 31 072235 P 33
075112 P 35 075733 P 37 077945 P 38
SEISMOLOGY
044832 P 19
SITING
008330 P 3 054494 P 24 065107 P 29
SITING, REACTOR
064776 P 28
SKIN
061721 P 27
SNOW
050855 P 21
SOCIO/PHILOSOPHICAL CONSIDERATION
072960 P 34 077191 P 38
SODIUM
025597 P 11 068114 P 31
SOIL
027023 P 11 036248 P 15 040781 P 16 043099 P 18
043154 P 18 051562 P 22 051840 P 23 053772 P 23
061927 P 27 069396 P 33 082301 P 40 082780 P 41
SOIL MECHANICS
078450 P 39
SOIL PROPERTY
007132 P 1 072235 P 33 075494 P 36 078450 P 39
SOIL PROPERTY, IN SITU
065087 P 29 075733 P 37 079408 P 39
SOIL, NUCLIDE OCCURRENCE
007456 P 2 008330 P 3 013712 P 5 042853 P 17
045087 P 20 065107 P 29 069508 P 33 077945 P 38
083190 P 42
SOIL, RADIONUCLIDE MOVEMENT THROUGH
004950 P 1 007132 P 1 007456 P 2 007620 P 2
013802 P 6 015304 P 8 021824 P 10 027021 P 11
027025 P 12 027078 P 12 028688 P 12 036248 P 15
036413 P 15 044832 P 19 058730 P 25 061927 P 27
068583 P 31 072235 P 33 075491 P 36 075733 P 37
079408 P 39
SORPTION
021824 P 10 075733 P 37
SOURCE, ELEVATED
072972 P 10 061104 P 26 061201 P 26
SOURCE, RADIATION
072991 P 34
SOUTH AFRICA
061130 P 26
SPECIFIC ACTIVITY
047066 P 20 064781 P 28 072235 P 33
SPECTROMETRY
076284 P 37 076284 P 37
SPECTROMETRY, GAMMA
013818 P 8 065109 P 29
SPOKESMAN, AEC
065420 P 30
SPOKESMAN, UTILITY
044109 P 19
STABLE ISOTOPE
075494 P 36 077835 P 38
STACK
033384 P 14 052042 P 23
STIMULATION
055002 P 24 068694 P 32 078450 P 39
STRATOSPHERE
008303 P 2 013282 P 4 025597 P 11 028902 P 12
030108 P 13 030129 P 13 030682 P 14 032094 P 14
043106 P 18 045485 P 20 082320 P 41
STRONTIUM
004811 P 1 004950 P 1 007132 P 1 007456 P 2
008303 P 2 008330 P 3 008686 P 3 013282 P 4
013712 P 5 013798 P 6 015304 P 8 017272 P 9
020442 P 9 021824 P 10 023297 P 10 025597 P 11
032094 P 14 043090 P 17 048899 P 21 051130 P 21
060477 P 26 060857 P 26 061130 P 26 065107 P 29
065109 P 29 065420 P 30 066272 P 30 069036 P 32
072235 P 33 075309 P 36 075494 P 36 077945 P 38
079324 P 39 082320 P 41
SURFACE CONTAMINATION
030129 P 13 045087 P 20 075112 P 35 083190 P 42
SURFACE WATER
003488 P 1 006736 P 1 044832 P 19 053779 P 23
081445 P 40
SURFACE WATER, DISPOSAL MEDIA
006736 P 1 069508 P 33
SURFACE WATER, NUCLIDE OCCURRENCE
004811 P 1 012287 P 4 013347 P 5 013712 P 5
013795 P 5 013801 P 6 013805 P 7 028902 P 12
030108 P 13 033090 P 14 043099 P 18 057383 P 25
068114 P 31 069036 P 32 077945 P 38
SURFACE WATER, PROPERTY
006736 P 1 017272 P 9
SURFACE WATER, SEDIMENT
065109 P 29
SURFACE WATER, SUSPENDED MATERIAL
004811 P 1
SURFACE WATER, TRACER
006736 P 1 027021 P 11 027025 P 12
SURVEILLANCE PROGRAM
033090 P 14 043090 P 17 043099 P 18 044832 P 19
055973 P 24 065109 P 29 067891 P 31 068583 P 31
075733 P 37
SURVEY
057383 P 25
SURVEY, ENVIRONMENT
004811 P 1 064789 P 29 065109 P 29 072235 P 33
082903 P 41
SURVEY, RADIATION
081445 P 40
SUTTON DIFFUSION FORMULA
022972 P 10
SYSTEM ANALYSIS
075576 P 37
SYSTEM CAPACITY
048899 P 21
TECHNETIUM
021824 P 10
TEMPERATURE
043272 P 18 047066 P 20
TEST, LEAK LOCATION
075494 P 36
TEST, WEAPONS
072991 P 34 077191 P 38 082320 P 41
TESTING
028902 P 12 030108 P 13 033090 P 14 045087 P 20
064789 P 29 076899 P 37
TESTIS
061130 P 26
THEORETICAL INVESTIGATION
079242 P 39
THERMAL CONSIDERATION
030129 P 13
THERMAL POLLUTION
036248 P 15 044378 P 19 044471 P 19 059243 P 25
065087 P 29 065420 P 30
TOPOGRAPHY
080611 P 40
TRACE ELEMENT
066272 P 30
TRACER
039157 P 16 059243 P 25
TRACER, GAS
017268 P 8
TRACER, RADIOACTIVE
007341 P 2 008303 P 2 013805 P 7 017268 P 8
027078 P 12 030108 P 13 033384 P 14 042853 P 17
043090 P 17 045485 P 20 059243 P 25 061201 P 26
068114 P 31 069396 P 33 075494 P 36 077945 P 38
TRANSPIRATION
037402 P 15 069396 P 33 083190 P 42
TRANSPORT
042853 P 17 052042 P 23 053221 P 23 068583 P 31
069396 P 33 073740 P 35 076899 P 37 082301 P 40
082190 P 42
TRANSPORT THEORY
044832 P 19
TROPOSPHERE
013797 P 5 025597 P 11 028902 P 12 030108 P 13
030129 P 13 032094 P 14 043361 P 19 045485 P 20
060857 P 26 082320 P 41
TUNGSTEN
025597 P 11
TURNOVER RATE
043087 P 17 043099 P 18 064781 P 28
UNITED KINGDOM
019263 P 9 068114 P 31
UNITED STATES

013805 P 7 055973 P 24 057383 P 25 081106 P 40
URANIUM
052405 P 23
USSR
075112 P 35
VAPOR EXCHANGE
037402 P 15 064036 P 28 074536 P 35 082301 P 40
VAPOR PRESSURE
043272 P 18
VEGETATION
028688 P 12 036248 P 15 036413 P 15 043154 P 18
045087 P 20 051169 P 21 055002 P 24 069396 P 33
069508 P 33 072235 P 33 082301 P 40 082903 P 41
VOLATILITY PROCESS
043272 P 18
WASHOUT
023879 P 11 033090 P 14 051432 P 22 060857 P 26
073740 P 35 077835 P 38 079242 P 39
WASTE DISPOSAL
008330 P 3 021824 P 10 023297 P 10 048899 P 21
051569 P 22 065087 P 29 075576 P 37
WASTE DISPOSAL, ATMOSPHERIC
022972 P 10 061721 P 27
WASTE DISPOSAL, LIQUID
012287 P 4 017272 P 9 021824 P 10 027021 P 11
069508 P 33
WASTE DISPOSAL, OCEAN
047066 P 20 065109 P 29 067891 P 31 069036 P 32
WASTE DISPOSAL, RIVER
006736 P 1 075309 P 36
WASTE DISPOSAL, TERRESTRIAL
004950 P 1 012287 P 4 021824 P 10 043090 P 17
082903 P 41
WASTE MANAGEMENT
027021 P 11 065420 P 30 081106 P 40
WASTE STORAGE
027021 P 11 083190 P 42
WASTE TREATMENT
066272 P 30 077191 P 38 081106 P 40
WATER
003488 P 1 013283 P 4 023297 P 10 037402 P 15
040777 P 16 050670 P 21 051130 P 21 051169 P 21
051171 P 22 051272 P 22 051276 P 22 051432 P 22
051562 P 22 051578 P 22 051840 P 23 055002 P 24
064781 P 28 065163 P 30 067088 P 31 069396 P 33
078450 P 39 082301 P 40
WATER POLLUTION
048899 P 21 075576 P 37 077945 P 38 079408 P 39
082780 P 41
WATER QUALITY
017272 P 9
WATER VAPOR
017816 P 9 022972 P 10 033384 P 14 037402 P 15
047170 P 20 047270 P 21 062726 P 27 064036 P 28
070396 P 33 076901 P 38 080611 P 40 082301 P 40
083190 P 42
WATER, DRINKING
061721 P 27 067088 P 31 075309 P 36 082320 P 41
WATER, IRRIGATION
075309 P 36
WHOLE BODY
068619 P 32
WIND PROFILE
055002 P 24
WIND STATISTICS
055002 P 24
X-RAY
013818 P 8
XENON
066272 P 30 068619 P 32
YEAR
064789 P 29
YOUNG
064776 P 28
ZINC
065087 P 29 065420 P 30 075309 P 36
ZIRCONIUM
023297 P 10 069036 P 32

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

ABRAHAM P
022972 P 10
AHAVIS RJ
075576 P 37
ANDERSON K
033090 P 14
ANSPAUGH LR
037402 P 15 068694 P 32 070296 P 33
ANTONELLI A
075309 P 36
ATHAVALE RN
020442 P 9
BALLEREAU P
062726 P 27
BANKS RB
006736 P 1
BARRACLOUGH JT
017272 P 9 023297 P 10
BARRY PJ
007741 P 2 059243 P 25 064776 P 28
BARTON CJ
055111 P 24
BASSON JK
061130 P 26
BEGEMANN F
030475 P 13 050988 P 21
BELL CG
006736 P 1
BERLIN A
075576 P 37
BERNHARD M
079324 P 39
BIANCHI WC
011784 P 3
BIEN GS
069036 P 32
BIGELEISEN J
051222 P 22
BITTEL, R
057579 P 25
BOLCH WE
065109 P 29
BOLIN B
013283 P 4
BOMBACE MA
075309 P 36
BOOTH RS
061927 P 27
BOWEN VT
069036 P 32
BOWMAN CR
063371 P 27
BRADLEY WF
023879 P 11
BRAR SS
075491 P 36
BROECKER FA
069036 P 32
BROECKER WS
064035 P 28
BROWN DJ
021824 P 10
BROWN KW
055002 P 24
BROWN RM
051276 P 22 054494 P 24
BUTLER GC
052042 P 23
BUTLER HM
055111 P 24
BUTTLAR HV
013347 P 5 013795 P 5
CADLE RD
030682 P 14
CAMERON JF
013282 P 4
CARLSTON CW
043087 P 17
CARROLL TE
075246 P 36
CARTER HW
077191 P 38
CHAMBERLAIN AC
051432 P 22
CIGNA AA
075309 P 36
CIGNA R
075309 P 36
CLERSCH A
007620 P 2
CLEGG B
069396 P 33
COHEN JJ
072960 P 34
COLON JA
075491 P 36
COMAR CL
068619 P 32
COREY JC
027023 P 11 027025 P 12 027078 P 12
COWLES JO
081106 P 40
COWPER G
077945 P 38
CRAWFORD TV
080611 P 40
CROUZET E
072304 P 34
CUMMING RB
055111 P 24
DALY JC
061201 P 26
DAVIDSON RS
075246 P 36
DAVIS SN
009164 P 3
DICKERSON MH
080611 P 40
DOCKINS KO
053760 P 23
DOURY A
033922 P 14 043361 P 19 053552 P 23
EGURNOV VY
100297 P 42
EISENRUD M
082320 P 41
ERIKSSON E
013283 P 4 051298 P 22 076899 P 37
ESSIG TH
068583 P 31
ESSINGTON EH
044832 P 19 075733 P 37
FARNSWORTH RK
057383 P 25
FARZINE K
013795 P 5
FENIMORE JW
027021 P 11 027025 P 12
FENSKE PR
044832 P 19 079408 P 39
FERGUSSON GJ
013797 P 5
FETFRIS PJ
023879 P 11
FOLSOM TR
067891 P 31 069036 P 32
FORSLOW EJ
075733 P 37
FREJAVILLE G
016975 P 8
FRIEDMAN I
030475 P 13
GARAY JJ
033384 P 14 061201 P 26
GARNER RJ
068619 P 32
GASILINA NK
075112 P 35
GASPAR E
075494 P 36
GAT JR
013804 P 7
HADLEY G
069396 P 33
HAINES A
013251 P 4 030457 P 13
HAKONSON TE
082903 P 41
HALES JM
073740 P 35 079242 P 39

HARRISON FL
047066 P 20
HARWARD FD
036855 P 15
HASKELL FE
011784 P 3
HAWKINS DB
012287 P 4
HAZLETON-NUCLEAR S
053221 P 23
HECKMAN RA
081106 P 40
HEET RE
047066 P 20
HIGGINS GH
072960 P 34
HILSMEIER WF
008303 P 2
HOLLAND JZ
025597 P 11
HOP HW
055002 P 24
HORTON JH
027078 P 12
HOUTERMANS J
013801 P 6
HUBERT P
072304 P 34
HUFF FA
023879 P 11
HUISWAARD PJ
006736 P 1
HUTCHESON CG
019263 P 9
IAEA
051272 P 22 054493 P 24
INOUE Y
004950 P 1
JACOBS DG
007132 P 1 015304 P 8 030129 P 13 063371 P
JENSEN RG
017272 P 9 023297 P 10
JOHNSON LJ
082903 P 41
JONES PM
019263 P 9
JORDAN CF
028688 P 12 036413 P 15 042853 P 17 058730 P
075491 P 36
JORDAN, CF
056628 P 25
KAUFMAN WJ
004950 P 1
KELLY MJ
061927 P 27
KERR PW
060857 P 26
KIEFER H
061104 P 26
KIGOSHI K
043102 P 18 043106 P 18 047170 P 20 047270 P
KINCAID GP JR
076284 P 37 076284 P 37
KIRCHMANN R
064781 P 28 065163 P 30 074536 P 35
KLINE JR
028688 P 12 036413 P 15 058730 P 25 075491 P
KLINE, JR
056628 P 25
KNOX JB
051130 P 21
KOCZY FF
052495 P 23
KONIG LA
061104 P 26 072991 P 34 074336 P 35
KORANDA J
069396 P 33
KORANDA JF
036413 P 15
KORANDA JJ
023154 P 10 037402 P 15 039157 P 16 040781 P
053772 P 23 058730 P 25 064799 P 29 068694 P
069508 P 33 070396 P 33
KORANDA, JJ
056628 P 25
KOVALENKO AF
100297 P 42
KRAJEWSKI R
060857 P 26
KREUTZ W
013802 P 6
LAFONTAINE A
064781 P 28 065163 P 30
LAI D
013798 P 6 020442 P 9
LANERI U
075309 P 36
LARSON CE
044471 P 19
LE GRAND J
041721 P 27
LEAVITT VD
045087 P 20
LEVENTHAL JS
011784 P 3 028902 P 12
LEVEQUE P
040777 P 16
LIBRY WF
028902 P 12 050670 P 21
LIEBERMAN JA
007620 P 2
LYNCH FJ
009164 P 3
MACHTA L
013712 P 5
MARCE A
072304 P 34
MARTELL EA
076901 P 38
MARTIN JR
036413 P 15 037402 P 15 058730 P 25 069508 P 3
070396 P 33
MARTIN, JR
056628 P 25
MASON RJ
045087 P 20 055002 P 24
MAWSON CA
072235 P 33 077945 P 38
MCMAHON JW
003488 P 1
MERRITT WF
059243 P 25
MILLER CE
008303 P 2
MILLER CL
055002 P 24
MOGHISSI AA
077191 P 38
MORRIS DA
008330 P 3
MULLINS JW
055973 P 24
MUNNICH KO
013802 P 6
MUSGRAVE B
013251 P 4
MUSGRAVE BC
030457 P 13
NAKAYAMA ES
051562 P 22
NIKOLAEV DA
043272 P 18
NORK WF
044832 P 19 075733 P 37
NYMAN JW
082903 P 41
ODEN S
043099 P 18
ODUM HT
071312 P 9 053779 P 23
OESTLUND HG
073004 P 34
OLIVE P
072304 P 34
ONEAL D
043154 P 18
OSBORNE RV
067088 P 31
OSTLUND HG
013800 P 6 082301 P 40
OTLET PL
040000 P 16
PARKER EL
015304 P 8
PARSONS PJ
051569 P 22
PAYNE BR
013282 P 4 013803 P 7 045485 P 20
PETERSON HT
036855 P 15

PHILLIPS WA
047066 P 20
PIPER AM
051840 P 23
PLANFT J
061721 P 27
POSTLE GL
009164 P 3
PURTYMUN WD
083190 P 42
RAMA
013798 P 6 020442 P 9
REICHERT SO
043090 P 17
RICHARDS HJ
068114 P 31
ROBERTSON JB
023297 P 10
ROBINSON WL
068694 P 32
ROBISON WL
070396 P 33
ROETHER W
013802 P 6
ROHWER PS
055111 P 24 082780 P 41
ROMANOV VV
075112 P 35
ROSLYI EI
075112 P 35
RUDOLPH AW
075246 P 36
SAUZAY G
045485 P 20
SAX NI
033384 P 14 061201 P 26
SCHELL WR
045485 P 20
SCHMALZ BL
012287 P 4
SCHUBACH K
013802 P 6
SCHUFRT FA
069036 P 32
SHAIKH MU
007132 P 1 015304 P 8
SHALYGIN VA
043272 P 18
SIEGFL O
013802 P 6
SIMPSON JH
064036 P 28
SIWFRTZ E
072304 P 34
SKAUEN DM
053417 P 23
SMEETS JGPM
075576 P 37
SMITH DB
068114 P 31
SOIFFR VN
075112 P 35
SOMAN SD
022972 P 10
STEAD FW
007456 P 2 051578 P 22
STEIN JL
055973 P 24
STEWAET GL
057383 P 25
STEWART GL
013805 P 7
STEWART ML
075491 P 36
STIGALL GE
048899 P 21
STRUXNESS EG
063371 P 27
SUESS HE
040040 P 16
SUTRA-FOURCADE Y
042995 P 17
TADMOR J
077835 P 38
TATARINSKII VS
043272 P 18
TAYLOR CB
032094 P 14 050855 P 21 051171 P 22 054496 P 2
060477 P 26
TEASDALE WE
008330 P 3 017272 P 9 023297 P 10
THATCHER LL
013282 P 4 013803 P 7
THOMPSON JC
065107 P 29
THURBER DL
064035 P 28
TIMASHEV AP
100297 P 42
TOMIKURA Y
043106 P 18
UZZAN G
061721 P 27
VAN DEN HOEK J
064781 P 28 074536 P 35
VANAS D
061130 P 26
VANDENHOEK J
065163 P 30
VANDERWESTHUSIZEN
061130 P 26
VAUBERT, R
057579 P 25
VAUGHAN BE
065087 P 29
VIGNEAUX M
040777 P 16
VLEGGAAR CW
061130 P 26
VOLCHOK HL
069036 P 32
WEAVER CL
036855 P 15
WETHINGTON JA
078450 P 39 082858 P 41
WINTER M
061104 P 26 074336 P 35
WIPPER WJ
045087 P 20
WOHLFAHRT D
013795 P 5
WOODS FW
043154 P 18 051169 P 21
WYERMAN TA
057383 P 25
YONEDA K
047170 P 20 047270 P 21
ZELVENSKII YD
043272 P 18
ZIMMERMANN U
013802 P 6

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN THE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE. * INDICATES END OF TITLE.)

IN THE ATMOSPHERE.* #AN	ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS	051298 P 22
IN THE ATMOSPHERE* #AN	ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS	076899 P 38
NATURAL WATERS IN THE SOUTH PACIFIC OCEAN AREA, 1959-63, #	ACCURACY IN THE DETERMINATION OF THE TRITIUM CONTENTS OF	051171 P 22
#TRACING GROUNDWATER WITH CHLORIDE IONS AND TRITIUM THROUGH	ACID KAOLINITIC SOIL*	027025 P 12
#MOVEMENT OF WATER TAGGED WITH H-2, H-3, AND C-18 THROUGH	ACIDIC KAOLINITIC SOIL*	027078 P 12
GLOBAL FALLOUT OF H-3 AND SR-90* #MEASUREMENT OF TRITIUM	ACTIVITY IN NATURAL WATERS, PART II, CHARACTERISTICS OF	020442 P 9
#RESULTS OF THE TRITIUM	ACTIVITY MEASUREMENT OF SOME WATERS OF THE SOUTHWEST*	040777 P 16
#	ADSORPTION OF TRIFE HYDROGEN ISOTOPES ON CHARCOAL*	019263 P 9
CLIFFS NUCLEAR POWER PLANTS* #	AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT	038641 P 15
TESTS* #SECOND	AEC CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS	008303 P 2
#EXPERIENCE WITH DILUTION RATE FACTORS FROM THE	AECL REACTOR STACK.*	052042 P 23
#RADIOACTIVE FALLOUT OVER SOUTH	AFRICA AND ITS BIOLOGICAL UPTAKE*	061130 P 26
#SEMINAR ON THE PROTECTION	AGAINST THE DANGERS OF TRITIUM*	013458 P 5
#MEANS OF DETECTING AND PROTECTING	AGAINST TRITIUM*	042995 P 17
DETERMINATION OF CHARACTERISTICS OF WATER BODIES WITH THE	AID OF BOMB PRODUCED TRITIUM PULSES* #THE	013804 P 7
#STUDY OF PROPAGATION OF ATMOSPHERIC POLLUTANTS WITH THE	AID OF TRITIUM*	061104 P 26
RECENT EXPERIMENTS ON TRANSFER OF RADIOACTIVE TRACERS FROM	AIR TO NATURAL SURFACES* #SOME	007341 P 2
#MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN	AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (T16431)*	064776 P 28
SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS	ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969*	081445 P 40
OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS	ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31, 1972*	082903 P 41
TRANSPORT AT THE CANNIKIN SITE, AMCHITKA ISLAND,	ALASKA* #EVENT-RELATED HYDROLOGY AND RADIONUCLIDE	079408 P 39
HYDROLOGY AND RADIONUCLIDE TRANSPORT AT THE CANNIKIN SITE,	AMCHITKA ISLAND, ALASKA* #EVENT-RELATED	079408 P 39
#DATING TRITIUM DISPERSAL IN GROUND WATER BY TREE RING	ANALYSIS.*	051276 P 22
RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO	ANIMALS AND MAN* #TRANSFER OF	068619 P 32
#TRITIUM CONTENT OF	ANTARCTIC SNOW.*	050855 P 21
#ATMOSPHERIC TRITIUM, MEASUREMENT AND	APPLICATION*	016975 P 8
OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA, WITH	APPLICATIONS IN SOIL SCIENCE AND HYDROLOGY* #THE	043099 P 18
MANAGEMENT OF WATER RESOURCES.* #POTENTIAL	APPLICATIONS OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND	051840 P 23
#LOW-LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL	APPLICATIONS*	040000 P 16
#SYMPOSIUM OF RADIOECOLOGY	APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT*	075576 P 37
#AN ECOLOGICAL	APPROACH TO ENVIRONMENTAL SURVEILLANCE*	065109 P 30
#RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST	AREA*	075733 P 37
MOVEMENT OF TRITIUM FROM THE CHALK RIVER LIQUID DISPOSAL	AREA.* #THE	051569 P 22
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION	AREA, IDAHO, ANNUAL PROGRESS REPORT, 1965*	017272 P 9
OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS	AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969* SURVEY	081445 P 40
CONTENTS OF NATURAL WATERS IN THE SOUTH PACIFIC OCEAN	AREA, 1959-63, AT THE TRITIUM LABORATORY, INSTITUTE OF	051171 P 22
INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE	AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH	082903 P 41
UPPER ATMOSPHERE* #PROBLEMS	ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE	025597 P 11
#TRITIUM DISTRIBUTION IN GROUND WATER	AROUND LARGE UNDERGROUND FUSION EXPLOSIONS.*	051578 P 22
METHANE* #ON THE INVENTORY OF	ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN ATMOSPHERIC	076901 P 38
#TRITIATED WATER	AS A TOOL FOR ECOLOGICAL FIELD STUDIES.*	051169 P 22
#TRITIATED WATER	AS A TOOL FOR ECOLOGICAL FIELD STUDIES*	043154 P 19
#TRITIUM GEOPHYSICS	AS AN INTERNATIONAL RESEARCH PROJECT*	040040 P 16
DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR	AS THE TRACER* #GRAPHICAL EVALUATION OF EXPERIMENTS TO	074336 P 35
NUCLEAR DEVICES* #ENVIRONMENTAL	ASPECTS OF NATURAL GAS STIMULATION EXPERIMENTS WITH	068694 P 32
#CERTAIN ENVIRONMENTAL	ASPECTS OF TRITIUM*	082301 P 40
OF RADIONUCLIDES BY GROUND WATER- SOME THEORETICAL	ASPECTS* #TRANSPORT	009164 P 3
UTILIZATION OF NATURAL GAS FROM A NUCLEAR STIMULATED #AN	ASSESSMENT OF THE RADIOLOGICAL IMPLICATION OF COMMERCIAL	063371 P 27
AND RADIOLOGICAL-SAFETY FEASIBILITY STUDIES,	ATLANTIC-PACIFIC INTEROCEANIC CANAL. HYDROGEN BUDGET AND	053779 P 23
#CHEMICAL STATE OF TRITIUM IN THE	ATMOSPHERE AND SOURCES OF TRITIATED METHANE*	013251 P 4
OF THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE	ATMOSPHERE.* #HAZARDS	053552 P 23
OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE	ATMOSPHERE.* #AN ACCOUNT	051298 P 22
#TRITIUM INJECTION AND CONCENTRATION DISTRIBUTION IN THE	ATMOSPHERE*	045485 P 20
OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE	ATMOSPHERE* #AN ACCOUNT	076899 P 38
BY THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE	ATMOSPHERE* #RISK PRESENTED	033922 P 14
IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER	ATMOSPHERE* #PROBLEMS ARISING	025597 P 11
IN THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE	ATMOSPHERE* #THE RISKS PRESENT	043361 P 19
#HEALTH IMPLICATIONS OF	ATMOSPHERIC DISCHARGE OF TRITIATED WATER*	061721 P 27
TRACER* #GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE	ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE	074336 P 35
#TRITIUM DETERMINATIONS IN	ATMOSPHERIC GASES AND METEORITES. FINAL REPORT.*	050988 P 21
#TRITIUM CONTENT OF	ATMOSPHERIC METHANE AND ETHANE*	030457 P 13
#TRITIUM AND CRUTERIUM IN	ATMOSPHERIC METHANE*	030475 P 13
THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN	ATMOSPHERIC METHANE* #ON	076901 P 38
OF CONTINENTS WHICH DETERMINE THE ISOTOPIC COMPOSITION OF	ATMOSPHERIC MOISTURE (BASED ON THE TRITIUM SPACE-TIME	075112 P 35
#DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF	ATMOSPHERIC MOISTURE*	047170 P 20
#DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF	ATMOSPHERIC MOISTURE*	047270 P 21
#	ATMOSPHERIC PATHWAYS OF MAN-MADE C-14, H-3, AND SR-90*	013798 P 6
#STUDY OF PROPAGATION OF	ATMOSPHERIC POLLUTANTS WITH THE AID OF TRITIUM*	061104 P 26
(BASED ON THE TRITIUM SPACE-TIME DISTRIBUTION IN THE	ATMOSPHERIC PRECIPITATION OF THE NORTHERN HEMISPHERE)*	075112 P 35
#ROLE OF METHYLENE IN THE PRODUCTION OF	ATMOSPHERIC TRITIATED METHANE*	030692 P 14
#	ATMOSPHERIC TRITIUM, MEASUREMENT AND APPLICATION*	016975 P 8
PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972*#	ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH	077945 P 38
LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, #	ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR	066272 P 30
#CALVERT CLIFFS,	BALTIMORE GAS AND ELECTRIC CO.*	044109 P 19

DETERMINE THE ISOTOPIC COMPOSITION OF ATMOSPHERIC MOISTURE (BASED ON THE TRITIUM SPACE-TIME DISTRIBUTION IN THE 075112 P 35
#RADIOECOLOGICAL STUDY OF THE HUMBOLDT BAY MARINE ENVIRONMENT* 047066 P 20
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 13
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1970* 068583 P 31
#NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 31
STUDIES, ATLANTIC-PACIFIC INTEROCEANIC CANAL, HYDROGEN # BIOENVIRONMENTAL AND RADIOLOGICAL-SAFETY FEASIBILITY 053779 P 23
1965* # BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 013818 P 8
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 24
LABORATORIES PROGRESS REPORT, OCT. 1 TO DEC 31, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENT RESEARCH 072235 P 33
1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 077945 P 38
1 - JUNE 30, 1968* # BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 030108 P 13
ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 066272 P 30
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 35
#THE DETERMINATION OF CHARACTERISTICS OF WATER BODIES WITH THE AID OF BOMB PRODUCED TRITIUM PULSES* 013804 P 7
OF CHARACTERISTICS OF WATER BODIES WITH THE AID OF BOMB PRODUCED TRITIUM PULSES* #THE DETERMINATION 013804 P 7
BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENT RESEARCH BRANCH* PROGRESS REPORT, OCT. 1 TO DEC 31, 1971 - 072235 P 33
PUERTO RICO, PERTINENT TO CONSIDERATION OF #HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, 021312 P 9
STUDIES, ATLANTIC-PACIFIC INTEROCEANIC CANAL, HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, 053779 P 23
#ENVIRONMENTAL BURDENING BY TRITIUM* 072991 P 34

#A TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING TRITIATED MOISTURE* 061201 P 24
IN SOIL SCIENCE AND HYDROLOGY* #THE OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA, WITH APPLICATIONS 043099 P 18
#PRELIM STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC PROVING GROUND* 064789 P 29
#ATMOSPHERIC PATHWAYS OF MAN-MADE C-14, H-3, AND SR-90* 013798 P 6
TOWARD IRRIGATION WELLS IN WESTERN FRESNO COUNTY, CALIFORNIA* TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER 011784 P 3
#AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* 038641 P 15
CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 19
PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972*#ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION 077945 P 38
AND HEALTH PHYSICS DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY 066272 P 30
#TRITIUM IN PRECIPITATION AT CANADIAN SITES (1953-1963).* 054494 P 24
SAFETY FEASIBILITY STUDIES, ATLANTIC-PACIFIC INTEROCEANIC CANAL, HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST 053779 P 23
#EVENT-RELATED HYDROLOGY AND RADIONUCLIDE TRANSPORT AT THE CANNIKIN SITE, AMCHITKA ISLAND, ALASKA* 079408 P 39
#TRITIUM AND CARBON-14 IN THE TREE RINGS* 043106 P 18
#NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* 043102 P 18
#RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA* 075733 P 37
CERTAIN ENVIRONMENTAL ASPECTS OF TRITIUM* 082301 P 40
VAPOR* #DOSE TO MAN VIA FOOD- CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER 070396 P 33
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 35
#THE MOVEMENT OF TRITIUM FROM THE CHALK RIVER LIQUID DISPOSAL AREA.* 051569 P 22
TO DEC 31, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - # CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, OCT. 1 072235 P 33
PHYSICS DIVISION, #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH 066272 P 30
MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* # 020442 P 9
UNDERLYING THE HANFORD RESERVATION* #MIGRATION CHARACTERISTICS OF RADIONUCLIDES THROUGH SEDIMENTS 021874 P 10
PRODUCED TRITIUM PULSES* #THE DETERMINATION OF CHARACTERISTICS OF WATER BODIES WITH THE AID OF BOMB 013804 P 7
#ADSORPTION OF THREE HYDROGEN ISOTOPES ON CHARCOAL* 019763 P 9
TRITIATED METHANE* # CHEMICAL STATE OF TRITIUM IN THE ATMOSPHERE AND SOURCES OF 013251 P 4
CHEMISTRY OF ISOTOPES.* 051222 P 22
#TRACING GROUNDWATER WITH CHLORIDE IONS AND TRITIUM THROUGH ACID KAOLINITIC SOIL* 027025 P 12
TRITIUM IN NATURAL WATERS AND THEIR RELATIONS TO THE GLOBAL CIRCULATION OF WATER* #OXYGEN-18, DEUTERIUM, AND 013283 P 4
#SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC* 065420 P 30
#AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* 038641 P 15
#CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 19
#IN- CLOUD PRECIPITATION SCAVENGING OF TRITIATED WATER VAPOR* 080611 P 40
#CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 19
#NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 31
OF SURFACE HYDROLOGY, EXPERIMENTAL DETERMINATION OF COEFFICIENT OF RUNOFF* #TRITIUM IN INVESTIGATION 072304 P 34
CLIFFS NUCLEAR POWER PLANTS* #AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT 039641 P 15
#AN ASSESSMENT OF THE RADIOLOGICAL IMPLICATION OF COMMERCIAL UTILIZATION OF NATURAL GAS FROM A NUCLEAR 063371 P 27
#SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC* 065420 P 30
HEMISPHERE* #A COMPARISON OF TRITIUM AND SR-90 FALLOUT IN THE SOUTHERN 060477 P 26
SOUTHERN HEMISPHERE* #A COMPARISON OF TRITIUM AND STRONTIUM-90 FALLOUT IN THE 032094 P 14
PERTINENT TO CONSIDERATION OF TRITIUM #HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, 021312 P 9
ATLANTIC-PACIFIC INTEROCEANIC CANAL, HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, 053779 P 23
SCREENING EFFECT OF CONTINENTS WHICH DETERMINE THE ISOTOPIC COMPOSITION OF ATMOSPHERIC MOISTURE (BASED ON THE TRITIUM 075112 P 35
#SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN* 073740 P 35
#SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN* 079242 P 39
#STUDY OF TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT* 073004 P 34
#TRITIUM INJECTION AND CONCENTRATION DISTRIBUTION IN THE ATMOSPHERE* 045435 P 20
LIST NO. 1* #TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER, 051272 P 22
#DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC MOISTURE* 047170 P 20
#DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC MOISTURE* 047270 P 21
PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE 013347 P 5
PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE 013795 P 5
RECENT YEARS* #NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN 043102 P 18
NUCLEAR REACTORS (T1643)* #MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM 064776 P 28
DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER ET INCORP 064781 P 28
INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* #TRANSFER AND 065163 P 30
TESTS* #SECOND AEC CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS 008303 P 2
EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL 044471 P 19
POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC 044471 P 19
IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TR* HYDROGEN BUDGET AND COMPARTMENTS 053779 P 23
IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM METABOLISM* AND COMPARTMENTS 021312 P 9
NATURELLES* #TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS 064781 P 28
#FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2* 004811 P 1
#THE POSSIBILITY OF GROUND WATER CONTAMINATION BY FALLOUT* 007620 P 2

FORMATIONS* #REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL 081106 P 40
#ANNUAL REPORT, 1971. STUDIES ON THE RADIOACTIVE CONTAMINATION OF THE SEA* 079324 P 39
#PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE* 025597 P 11
#THE HAZARD FROM TRITIUM CONTAMINATION* 057579 P 25
GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* # CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE 076284 P 37
GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* # CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE 076284 P 37
#TRITIUM CONTENT OF ANTARCTIC SNOW.* 050855 P 21
#TRITIUM CONTENT OF ATMOSPHERIC METHANE AND ETHANE* 030457 P 13
AREA, 1959- #ACCURACY IN THE DETERMINATION OF THE TRITIUM CONTENTS OF NATURAL WATERS IN THE SOUTH PACIFIC OCEAN 051171 P 22
#GEOCHEMICAL STUDIES OF CONTINENTAL WATERS* 064035 P 28
#THE DISTRIBUTION OF TRITIUM IN PRECIPITATION OVER CONTINENTS AND ITS SIGNIFICANCE TO GROUND-WATER DATING* 013803 P 7
ATMOSPHERIC MOISTURE (BASED ON THE #SCREENING EFFECT OF CONTINENTS WHICH DETERMINE THE ISOTOPIC COMPOSITION OF 075112 P 35
TO EVAPORATION AT THE SOIL SURFACE* # CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL 027023 P 11
MICROMETEOROLOGICAL VARIABLES* #A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH 069396 P 33
OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL- COUNTING TECHNIQUE* #TRITIUM CONCENTRATION 013347 P 5
OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL- COUNTING TECHNIQUE* #TRITIUM CONCENTRATION 013795 P 5
OF GROUNDWATER TOWARD IRRIGATION WELLS IN WESTERN FRESNO COUNTY, CALIFORNIA* USE OF TRITIUM TO MEASURE THE MOVEMENT 011784 P 3
#TRITIUM IN CRATER LAKE, OREGON* 064036 P 28
#RESIDUAL TRITIUM AT SEDAN CRATER* 039157 P 16
#RESIDUAL TRITIUM AT SEDAN CRATER* 023154 P 10
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 23
#WATER QUALITY IN FLOODED CRATERS PRODUCED BY NUCLEAR EXCAVATION.* 051130 P 21
AND OTHER ENVIRONMENTAL ISOTOPES IN THE HYDROLOGICAL CYCLE. PART I. REVIEW OF THE ENVIRONMENTAL ISOTOPES AND 054493 P 24

ATMOSPHERIC MOISTURE* # DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF 047170 P 20
ATMOSPHERIC MOISTURE* # DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF 047270 P 21
#SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM* 013458 P 5
NATURELLES* #TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS 064781 P 28
ANALYSIS.* # DATING TRITIUM DISPERSAL IN GROUND WATER BY TREE RING 051276 P 22
OVER CONTINENTS AND ITS SIGNIFICANCE TO GROUND-WATER DATING* #THE DISTRIBUTION OF TRITIUM IN PRECIPITATION 013803 P 7
#TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES* 064781 P 28
CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, OCT. 1 TO DEC 31, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - 072235 P 33
AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968- DEC. 1969* #EVALUATION OF TRITIUM IN GROUND 055973 P 24
REPORT. ENVIRONMENTAL RESEARCH, TERRESTRIAL ECOLOGY, JAN.- DEC. 1971* #RADIOLOGICAL PHYSICS DIVISION ANNUAL 075491 P 36
#AN INVESTIGATION OF TRITIUM DECONTAMINATION* 078450 P 39
#AN INVESTIGATION OF TRITIUM DECONTAMINATION* 082858 P 41
#LIQUID INJECTION INTO DEEP PERMEABLE FORMATIONS* 007132 P 1
#A TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING TRITIATED MOISTURE* 061201 P 26
FUEL REPROCESSING PLANT* # DEPOSITION OF KR-85 AND TRITIUM RELEASED FROM A NUCLEAR 077835 P 38
EXPLOSIVES - TRANSFER OF TRITIUM TO MAN FROM AN INITIAL WET DEPOSITION*RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR 061927 P 27
#CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE* 027023 P 11
EFFLUENT* # DESERT VEGETATION UPTAKE OF TRITIUM FROM PROJECT GASBUGGY 055002 P 24
#MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM* 042995 P 17
AID OF BOMB PRODUCED TRITIUM PULSES* #THE DETERMINATION OF CHARACTERISTICS OF WATER BODIES WITH THE 013804 P 7
TRITIUM IN INVESTIGATION OF SURFACE HYDROLOGY. EXPERIMENTAL DETERMINATION OF COEFFICIENT OF RUNOFF* # 072304 P 34
THE SOUTH PACIFIC OCEAN AREA, 1959-63, AT #ACCURACY IN THE DETERMINATION OF THE TRITIUM CONTENTS OF NATURAL WATERS IN 051171 P 22
REPORT.* #TRITIUM DETERMINATIONS IN ATMOSPHERIC GASES AND METEORITES. FINAL 050988 P 21
VAPOR AS THE TRACER*#GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER 074336 P 35
(BASED ON THE TRITIUM #SCREENING EFFECT OF CONTINENTS WHICH DETERMINE THE ISOTOPIC COMPOSITION OF ATMOSPHERIC MOISTURE 075112 P 35
#REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL FORMATIONS* 081106 P 40
#TRITIUM AND DEUTERIUM IN ATMOSPHERIC METHANE* 030475 P 13
RELATIONS TO THE GLOBAL CIRCULATION OF WATER* #OXYGEN-18, DEUTERIUM, AND TRITIUM IN NATURAL WATERS AND THEIR 013283 P 4
ASPECTS OF NATURAL GAS STIMULATION EXPERIMENTS WITH NUCLEAR DEVICES* #ENVIRONMENTAL 068694 P 32
* #HAZARDS OF THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE. 053552 P 23
#THE RISKS PRESENT IN THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE* 043361 P 19
#RISK PRESENTED BY THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE* 033922 P 14
DIFFUSION OF TRITIATED WATER IN SOILS.* 051562 P 22
#THE LIQUID-VAPOR SEPARATION FACTOR OF DILUTE SOLUTIONS OF DTO IN D2O* 100297 P 42
REACTOR STACK* #ESTIMATION OF DILUTION RATE FACTORS FOR TRITIATED WATER VAPOUR FROM A 022972 P 10
#EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL REACTOR STACK.* 052042 P 23
#ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 082903 P 41
#HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER* 061721 P 27
#EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* 048899 P 21
#DATING TRITIUM DISPERSAL IN GROUND WATER BY TREE RING ANALYSIS.* 051276 P 22
DISPERSION IN TIDAL ESTUARIES* 006736 P 1
#SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MAPPING WITH TRITIUM* 033384 P 14
#THE DISPERSION OF TRITIUM IN PERCH LAKE* 003488 P 1
EVALUATION OF EXPERIMENTS TO DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE TRACER* 074336 P 35
#THE MOVEMENT OF TRITIUM FROM THE CHALK RIVER LIQUID DISPOSAL AREA.* 051569 P 22
IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* #RADIONUCLIDES 043090 P 17
PROGRESS REPORT, 1962* #HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL 008330 P 3
FUSION EXPLOSIONS.* #TRITIUM DISTRIBUTION IN GROUND WATER AROUND LARGE UNDERGROUND 051578 P 22
UNDERGROUND NUCLEAR EXPLOSIONS* # DISTRIBUTION IN GROUNDWATER OF RADIONUCLIDES FROM 007456 P 2
#TRITIUM INJECTION AND CONCENTRATION DISTRIBUTION IN THE ATMOSPHERE* 045485 P 20
OF ATMOSPHERIC MOISTURE (BASED ON THE TRITIUM SPACE-TIME DISTRIBUTION IN THE ATMOSPHERIC PRECIPITATION OF THE 075112 P 35
#OCEANIC DISTRIBUTION OF RADIONUCLIDES FROM NUCLEAR EXPLOSIONS* 069036 P 32
AND ITS SIGNIFICANCE TO GROUND-WATER DATING* #THE DISTRIBUTION OF TRITIUM IN PRECIPITATION OVER CONTINENTS 013803 P 7
#TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 4
AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES 076284 P 37
AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES 076284 P 37
REPORT, OCT. 1 TO DEC 31, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENT RESEARCH BRANCH* PROGRESS 072235 P 33
1971* #ECOLOGICAL SCIENCES DIVISION ANNUAL PROGRESS REPORT. PERIOD ENDING SEPT. 30, 036248 P 15
TERRESTRIAL ECOLOGY, JAN.-DEC. 1971* #RADIOLOGICAL PHYSICS DIVISION ANNUAL REPORT. ENVIRONMENTAL RESEARCH, 075491 P 36
#BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1965* 013818 P 9
#BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 - JUNE 30, 1968* 030108 P 13

ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972* # 077945 P 38
RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*LIMITED, CHALK 066272 P 30
EXPOSURE TO TRITIATED WATER VAPOR* # DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM 070396 P 33
HYDROGEN ISOTOPES* # DOWNWARD MOVEMENT OF SOIL MOISTURE TRACED BY MEANS OF 013802 P 7
#THE LIQUID-VAPOR SEPARATION FACTOR OF DILUTE SOLUTIONS OF DTO IN D2O* 100297 P 42
ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER 064781 P 28
CONDITIONS NATURELLES* #TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN 064781 P 29
VAPOR SEPARATION FACTOR OF DILUTE SOLUTIONS OF DTO IN D2O* #THE LIQUID- 100297 P 42

#SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC* 065420 P 30
#PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES* 065087 P 29
#AN ECOLOGICAL APPROACH TO ENVIRONMENTAL SURVEILLANCE* 065109 P 30
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES.* 051169 P 27
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 18
DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 # ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE 082903 P 41
PERIOD ENDING SEPT. 30, 1971* # ECOLOGICAL SCIENCES DIVISION ANNUAL PROGRESS REPORT. 036248 P 15
#MOVEMENT OF TRITIUM IN ECOLOGICAL SYSTEMS* 069508 P 33
ECOLOGY - STUDIES OF A TROPICAL RAIN FOREST* 042853 P 17
#TRITIUM IN ECOLOGY, A REVIEW.* 053417 P 23
DIVISION ANNUAL REPORT, ENVIRONMENTAL RESEARCH, TERRESTRIAL ECOLOGY, JAN.-DEC. 1971* #RADIOLOGICAL PHYSICS 075491 P 36
#TRITIUM MOVEMENT IN A TROPICAL ECOSYSTEM* 058730 P 25
COMPOSITION OF ATMOSPHERIC MOISTURE (BASED ON #SCREENING EFFECT OF CONTINENTS WHICH DETERMINE THE ISOTOPIC 075112 P 35
#FALLOUT FROM NUCLEAR EXPLOSIONS. II. WORLDWIDE EFFECT* 082320 P 41
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE.* 051298 P 22
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE* 076899 P 39
#TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY* 075246 P 36
#NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 31
ON LAKE MICHIGAN* # EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES 048899 P 21
CONGRESS OF THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E 044471 P 19
#DESERT VEGETATION UPTAKE OF TRITIUM FROM PROJECT GASBUGGY EFFLUENT* 055002 P 24
PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (T1643)* #MAXIMUM 064776 P 28
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 23
#HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF 021312 P 9
HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TR* 053779 P 23
#CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 19
91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 044471 P 19
DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER ET INCORP 064781 P 29
ECOLOGICAL SCIENCES DIVISION ANNUAL PROGRESS REPORT. PERIOD ENDING SEPT. 30, 1971* # 036248 P 15
DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS 077945 P 38
LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR 066272 P 30
TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS SERIES NO. 61* #LABORATORY 017768 P 8
#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 31
#TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY* 075246 P 36
#TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWER PLANTS* 036855 P 15
#RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE EUREX NUCLEAR PLANT* 075309 P 36
1 TO DEC 31, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENT RESEARCH BRANCH* PROGRESS REPORT, OCT. 072235 P 33
#TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO ANIMALS AND MAN* 068619 P 32
#STUDY OF TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT* 073004 P 34
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 072960 P 34
#THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 15
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 13
#RADIOECOLOGICAL STUDY OF THE HUMBOLDT BAY MARINE ENVIRONMENT* 047066 P 20
OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT* #SYMPOSIUM 075576 P 37
EXPERIMENTS WITH NUCLEAR DEVICES* # ENVIRONMENTAL ASPECTS OF NATURAL GAS STIMULATION 068694 P 32
#CERTAIN ENVIRONMENTAL ASPECTS OF TRITIUM* 082301 P 40
ENVIRONMENTAL BURDENING BY TRITIUM* 072991 P 34
HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS* # ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - 044471 P 19
ISOTOPES IN THE HYDROLOGICAL CYCLE. PART I. REVIEW OF THE ENVIRONMENTAL ISOTOPES AND THEIR ROLE IN THE INVESTIGATION 054493 P 24
REVIEW OF THE ENVIRONMENTAL ISOTOPES AND #TRITIUM AND OTHER ENVIRONMENTAL ISOTOPES IN THE HYDROLOGICAL CYCLE. PART I. 054493 P 24
STUDIES AND THEIR RELATIONSHIP TO THE GENERAL PROBLEM OF ENVIRONMENTAL RADIOCONTAMINATION* #FALLOUT 065107 P 29
* #RADIOLOGICAL PHYSICS DIVISION ANNUAL REPORT. ENVIRONMENTAL RESEARCH, TERRESTRIAL ECOLOGY, JAN.-DEC. 1971 075491 P 36
#SELECTED ENVIRONMENTAL STUDIES USING RADIOACTIVE ISOTOPES* 068114 P 31
#AN ECOLOGICAL APPROACH TO ENVIRONMENTAL SURVEILLANCE* 065109 P 30
TESTING STATION* # ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR 012287 P 4
#RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON-85* 082780 P 41
VAPOUR FROM A REACTOR STACK* # ESTIMATION OF DILUTION RATE FACTORS FOR TRITIATED WATER 029972 P 10
#DISPERSION IN TIDAL ESTUARIES* 006736 P 1
ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER 064781 P 29
DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET 064781 P 29
#TRITIUM CONTENT OF ATMOSPHERIC METHANE AND ETHANE* 030457 P 13
#RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE EUREX NUCLEAR PLANT* 075309 P 36
DISPERSION WITH TRITIATED WATER VAPOR AS THE #GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE ATMOSPHERIC 074336 P 35
WESTERN UNITED STATES, APRIL 1968-DEC. 1969* # EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE 055973 P 24
OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE* #CONTRIBUTION 027023 P 11
#THE PERCH LAKE EVAPORATION STUDY* 059243 P 25
CANNIKIN SITE, AMCHITKA ISLAND, ALASKA* # EVENT-RELATED HYDROLOGY AND RADIONUCLIDE TRANSPORT AT THE 079408 P 39
#WATER QUALITY IN FLOODED CRATERS PRODUCED BY NUCLEAR EXCAVATION.* 051130 P 21
REACTOR STACK.* # EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL 052042 P 22
EXPERIENCES USING TRITIUM IN SCIENTIFIC HYDROLOGY* 013805 P 7
#TRITIUM IN INVESTIGATION OF SURFACE HYDROLOGY. EXPERIMENTAL DETERMINATION OF COEFFICIENT OF RUNOFF* 072304 P 34
TRITIUM MOVEMENT THROUGH A TROPICAL RAIN FOREST.* # EXPERIMENTAL TEST OF A MATHEMATICAL MODEL PREDICTING 036413 P 15
NATURAL SURFACES* #SOME RECENT EXPERIMENTS ON TRANSFER OF RADIOACTIVE TRACERS FROM AIR TO 007341 P 2
TRITIATED WATER VAPOR AS THE TRACER#GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE ATMOSPHERIC DISPERSION WITH 074336 P 35
#ENVIRONMENTAL ASPECTS OF NATURAL GAS STIMULATION EXPERIMENTS WITH NUCLEAR DEVICES* 068694 P 32
#FALLOUT FROM NUCLEAR EXPLOSIONS. II. WORLDWIDE EFFECT* 082320 P 41

IN GROUND WATER AROUND LARGE UNDERGROUND FUSION EXPLOSIONS.* #TRITIUM DISTRIBUTION 051578 P 22
#OCEANIC DISTRIBUTION OF RADIONUCLIDES FROM NUCLEAR EXPLOSIONS* 069036 P 32
IN GROUNDWATER OF RADIONUCLIDES FROM UNDERGROUND NUCLEAR EXPLOSIONS* #DISTRIBUTION 007456 P 2
REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - TRANSFER OF TRITIUM TO MAN FROM AN INITIAL 061927 P 27
RESOURCES.* #POTENTIAL APPLICATIONS OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER 051840 P 23
#DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* 070396 P 33

IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* #RADIONUCLIDES 043090 P 17
#THE LIQUID-VAPOR SEPARATION FACTOR OF DILUTE SOLUTIONS OF DTO IN D2O* 100297 P 42
#ESTIMATION OF DILUTION RATE FACTORS FOR TRITIATED WATER VAPOUR FROM A REACTOR STACK* 022972 P 10
#EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL REACTOR STACK.* 052042 P 23
FALLOUT FROM NUCLEAR EXPLOSIONS. II. WORLDWIDE EFFECT* 082320 P 41
#WORLD WIDE RADIOACTIVE FALLOUT FROM NUCLEAR TESTS-PART 1* 013712 P 5
#SECOND AEC CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS* 008303 P 2
#A COMPARISON OF TRITIUM AND STRONTIUM-90 FALLOUT IN THE SOUTHERN HEMISPHERE* 032094 P 14
#A COMPARISON OF TRITIUM AND SR-90 FALLOUT IN THE SOUTHERN HEMISPHERE* 060477 P 26
IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* #MEASUREMENT OF TRITIUM ACTIVITY 020442 P 9
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 26
PROBLEM OF ENVIRONMENTAL RADIOCONTAMINATION* # FALLOUT STUDIES AND THEIR RELATIONSHIP TO THE GENERAL 065107 P 29
#THE POSSIBILITY OF GROUND WATER CONTAMINATION BY FALLOUT* 007620 P 2
NO. 2* # FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT 004811 P 1
HYDROGEN BUDGET #BIOENVIRONMENTAL AND RADIOLOGICAL-SAFETY FEASIBILITY STUDIES, ATLANTIC-PACIFIC INTEROCEANIC CANAL. 053779 P 23
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES.* 051169 P 22
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 18
#VELA UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.* 053221 P 23
TRITIUM DETERMINATIONS IN ATMOSPHERIC GASES AND METEORITES. FINAL REPORT.* 050988 P 21
#POST-SHOT HYDROLOGIC SAFETY. PROJECT SHOAL. FINAL REPORT* 008686 P 3
#WATER QUALITY IN FLOODED CRATERS PRODUCED BY NUCLEAR EXCAVATION.* 051130 P 21
#TRACING SOIL MOISTURE AND GROUNDWATER FLOW AT THE SAVANNAH RIVER PLANT* 027021 P 11
#TRITIUM UPTAKE FOLLOWING A THERMONUCLEAR TEST* 045087 P 20
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 35
WATER VAPOR* #DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED 070396 P 33
CANAL. HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO 053779 P 23
CONSIDERATION #HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO 021312 P 9
#TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST* 028688 P 12
#ECOLOGY - STUDIES OF A TROPICAL RAIN FOREST* 042853 P 17
STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST* #RADIOECOLOGICAL 056628 P 25
MODEL PREDICTING TRITIUM MOVEMENT THROUGH A TROPICAL RAIN FOREST.* #EXPERIMENTAL TEST OF A MATHEMATICAL 036413 P 15
#LIQUID INJECTION INTO DEEP PERMEABLE FORMATIONS* 007132 P 1
GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL FORMATIONS* #REDUCTION OF RADIOACTIVE 081106 P 40
MOVEMENT OF GROUNDWATER TOWARD IRRIGATION WELLS IN WESTERN FRESNO COUNTY, CALIFORNIA* USE OF TRITIUM TO MEASURE THE 011784 P 3
#DEPOSITION OF KR-85 AND TRITIUM RELEASED FROM A NUCLEAR FUEL REPROCESSING PLANT* 077835 P 38
DISTRIBUTION IN GROUND WATER AROUND LARGE UNDERGROUND FUSION EXPLOSIONS.* #TRITIUM 051578 P 22

#CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 19
FORMATIONS* #REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL 081106 P 40
IMPLICATION OF COMMERCIAL UTILIZATION OF NATURAL GAS FROM A NUCLEAR STIMULATED WELL* OF THE RADIOLOGICAL 063371 P 27
#ENVIRONMENTAL ASPECTS OF NATURAL GAS STIMULATION EXPERIMENTS WITH NUCLEAR DEVICES* 068694 P 32
#DESERT VEGETATION UPTAKE OF TRITIUM FROM PROJECT GASBUGGY EFFLUENT* 055002 P 24
#SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN* 073740 P 35
#SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN* 079242 P 39
#TRITIUM DETERMINATIONS IN ATMOSPHERIC GASES AND METEORITES. FINAL REPORT.* 050988 P 21
#TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* 065163 P 30
#FALLOUT STUDIES AND THEIR RELATIONSHIP TO THE GENERAL PROBLEM OF ENVIRONMENTAL RADIOCONTAMINATION* 065107 P 29
GEOCHEMICAL STUDIES OF CONTINENTAL WATERS* 064035 P 28
DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS 076284 P 37
DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS 076284 P 37
OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL FORMATIONS* #REDUCTION 081106 P 40
#TRITIUM-HYDROLOGIC RESEARCH. SOME RESULTS OF THE U. S. GEOLOGICAL SURVEY RESEARCH PROGRAM* 043087 P 17
#TRITIUM GEOPHYSICS AS AN INTERNATIONAL RESEARCH PROJECT* 040040 P 16
#TRITIUM GEOPHYSICS FROM 1961-1962 NUCLEAR TESTS* 028902 P 12
#NORATORIUM TRITIUM GEOPHYSICS.* 050670 P 21
COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL- 013795 P 5
COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL- 013347 P 5
AND TRITIUM IN NATURAL WATERS AND THEIR RELATIONS TO THE GLOBAL CIRCULATION OF WATER* #OXYGEN-18, DEUTERIUM, 013283 P 4
#TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 4
ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* #MEASUREMENT OF TRITIUM 020442 P 9
ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE # GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE 074336 P 35
APRIL 1968-DEC. 1969* #EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, 055973 P 24
#TRITIUM DISTRIBUTION IN GROUND WATER AROUND LARGE UNDERGROUND FUSION EXPLOSIONS.* 051578 P 22
#DATING TRITIUM DISPERSAL IN GROUND WATER BY TREE RING ANALYSIS.* 051276 P 22
#THE POSSIBILITY OF GROUND WATER CONTAMINATION BY FALLOUT* 007620 P 2
1966 THROUGH MAY #REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 081445 P 40
#TRANSPORT OF RADIONUCLIDES BY GROUND WATER- SOME THEORETICAL ASPECTS* 009164 P 3
OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC PROVING GROUND* #PRELIM STUDIES 064789 P 29
THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING GROUND* #PRELIMINARY STUDIES OF 040781 P 16
IN PRECIPITATION OVER CONTINENTS AND ITS SIGNIFICANCE TO GROUND-WATER DATING* #THE DISTRIBUTION OF TRITIUM 013803 P 7
FACILITIES* #RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL 043090 P 17
* #RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1970 068583 P 31
#TRACING SOIL MOISTURE AND GROUNDWATER FLOW AT THE SAVANNAH RIVER PLANT* 027021 P 11
EXPLOSIONS* #DISTRIBUTION IN GROUNDWATER OF RADIONUCLIDES FROM UNDERGROUND NUCLEAR 007456 P 2
COUNTY, #THE USE OF TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER TOWARD IRRIGATION WELLS IN WESTERN FRESNO 011784 P 3

KAOLINITIC SOIL* #TRACING
#CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE
#CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE

#MOVEMENT OF WATER TAGGED WITH
WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF
#ATMOSPHERIC PATHWAYS OF MAN-MADE C-14,
#MOVEMENT OF WATER TAGGED WITH H-2,
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE
OF RADIONUCLIDES THROUGH SEDIMENTS UNDERLYING THE
#THE
THE ATMOSPHERE.* #
WATER* #
PROGRESS REPORT, OCT. 1 TO DEC 31, 1971 - BIOLOGY AND
30, 1968* #BIOLOGY AND
30, 1972* #ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND
LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND
#OXIDATION OF TRITIUM TO TRITIATED WATER AND
#ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER -
#TRITIUM IN SOUTHERN
#A COMPARISON OF TRITIUM AND SR-90 FALLOUT IN THE SOUTHERN
OF TRITIUM AND STRONTIUM-90 FALLOUT IN THE SOUTHERN
IN THE ATMOSPHERIC PRECIPITATION OF THE NORTHERN
#TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L
OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND
#A RELATIVE VOLATILITY OF
#RADIOECOLOGICAL STUDY OF THE
#1964
TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, LOWER
#STUDY OF TRITIATED
FEASIBILITY STUDIES, ATLANTIC-PACIFIC INTEROCEANIC CANAL,
VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM #
#ADSORPTION OF THREE
#DOWNWARD MOVEMENT OF SOIL MOISTURE TRACED BY MEANS OF
SURVEY RESEARCH PROGRAM* #TRITIUM-
#VELA UNIFORM, PROJECT SHOAL. POST-SHOT
#POST-SHOT
#LOW-LEVEL TRITIUM MEASUREMENTS FOR
ISOTOPES #TRITIUM AND OTHER ENVIRONMENTAL ISOTOPES IN THE
#RADIOACTIVE TRACERS FOR
AMCHITKA ISLAND, ALASKA* #EVENT-RELATED
TESTING STATION, IDAHO. ANNUAL PROGRESS REPORT, 1963* #
IDAHO. ANNUAL PROGRESS REPORT, 1965* #
1966* #
#EXPERIENCES USING TRITIUM IN SCIENTIFIC
SCANDINAVIA. WITH APPLICATIONS IN SOIL SCIENCE AND
RUNOFF* #TRITIUM IN INVESTIGATION OF SURFACE
ISOTOPES AND THEIR ROLE IN THE INVESTIGATION OF THE
#A RELATIVE VOLATILITY OF HTO SOLUTIONS IN
#TROPOSPHERIC SCAVENGING OF SR90 AND

GROUNDWATER WITH CHLORIDE IONS AND TRITIUM THROUGH ACID 027025 P 12
GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* 076284 P 37
GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* 076284 P 37

H-2, H-3, AND O-18 THROUGH ACIDIC KAOLINITIC SOIL* 027078 P 12
H-3 AND SR-90* #MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL 020442 P 9
H-3, AND SR-90* 013798 P 6
H-3, AND O-18 THROUGH ACIDIC KAOLINITIC SOIL* 027078 P 12
HANFORD PROJECT, JULY-DECEMBER 1970* 068583 P 31
HANFORD RESERVATION* #MIGRATION CHARACTERISTICS 021824 P 10
HAZARD FROM TRITIUM CONTAMINATION* 057579 P 25
HAZARDS OF THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN 053552 P 23
HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED 061721 P 27
HEALTH PHYSICS DIVISION - ENVIRONMENT RESEARCH BRANCH* 072235 P 33
HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 - JUNE 030108 P 13
HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 077945 P 38
HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31* 066272 P 30
HEALTH PHYSICS* 062726 P 27
HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS* 044471 P 19
HEMISPHERE PRECIPITATION (1953-1964).* 054496 P 24
HEMISPHERE* 060477 P 26
HEMISPHERE* #A COMPARISON 032094 P 14
HEMISPHERE)* (BASED ON THE TRITIUM SPACE-TIME DISTRIBUTION 075112 P 35
HERBE ET DU LAIT, EN CONDITIONS NATURELLES* 064781 P 28
HIS ENVIRONMENT* #SYMPOSIUM 075576 P 37
HTO SOLUTIONS IN H2O* 043272 P 18
HUMBOLDT BAY MARINE ENVIRONMENT* 047066 P 20
HURRICANE TRITIUM* 013800 P 6
HUTT, NEW ZEALAND.* PACIFIC OCEAN AREA, 1959-63, AT THE 051171 P 22
HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT* 073004 P 34
HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL 053779 P 23
HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL 021312 P 9
HYDROGEN ISOTOPES ON CHARCOAL* 019263 P 9
HYDROGEN ISOTOPES* 013802 P 7
HYDROLOGIC RESEARCH. SOME RESULTS OF THE U. S. GEOLOGICAL 043087 P 17
HYDROLOGIC SAFETY. FINAL REPORT.* 053221 P 23
HYDROLOGIC SAFETY. PROJECT SHOAL. FINAL REPORT* 008686 P 3
HYDROLOGICAL APPLICATIONS* 040000 P 16
HYDROLOGICAL CYCLE. PART I. REVIEW OF THE ENVIRONMENTAL 054493 P 24
HYDROLOGICAL WORKS* 075494 P 36
HYDROLOGY AND RADIONUCLIDE TRANSPORT AT THE CANNIKIN SITE, 079408 P 39
HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR 008330 P 3
HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION AREA, 017272 P 9
HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 023297 P 10
HYDROLOGY* 013805 P 7
HYDROLOGY* #THE OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT 043099 P 18
HYDROLOGY. EXPERIMENTAL DETERMINATION OF COEFFICIENT OF 072304 P 34
HYDROSPHERE.* CYCLE. PART I. REVIEW OF THE ENVIRONMENTAL 054493 P 24
H2O* 043272 P 18
H3* 060857 P 26

ENVIRONMENTAL ISOTOPES IN THE HYDROLOGICAL CYCLE. PART I. REVIEW OF THE ENVIRONMENTAL ISOTOPES AND THEIR ROLE IN 054493 P 24
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION AREA, IDAHO. ANNUAL PROGRESS REPORT, 1965* 017272 P 9
WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963* OF SUBSURFACE 008330 P 3
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966* 023297 P 10
#MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* 020442 P 9
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 23
#FALLOUT FROM NUCLEAR EXPLOSIONS. II. WORLDWIDE EFFECT* 082320 P 41
#STUDY OF RAINOUT OF RADIOACTIVITY IN ILLINOIS* 017816 P 9
#STUDY OF RAINOUT OF RADIOACTIVITY IN ILLINOIS. SIXTH PROGRESS REPORT* 023879 P 11
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 072960 P 34
A NUCLEAR STIMULATED WELL#AN ASSESSMENT OF THE RADIOLOGICAL IMPLICATION OF COMMERCIAL UTILIZATION OF NATURAL GAS FROM 063371 P 27
#HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER* 061721 P 27
85* #RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON- 082780 P 41
IN-CLOUD PRECIPITATION SCAVENGING OF TRITIATED WATER VAPOR* 080611 P 40
LAIT, EN CONDITIONS NATURELLES* #TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU 064781 P 28
CONDITIONS* #TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL 065163 P 30
#NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 31
OF NUCLEAR EXPLOSIVES - TRANSFER OF TRITIUM TO MAN FROM AN INITIAL WET DEPOSITION* SAFETY OF PEACEFUL USES 061927 P 27
#TRITIUM INJECTION AND CONCENTRATION DISTRIBUTION IN THE ATMOSPHERE* 045485 P 20
#LIQUID INJECTION INTO DEEP PERMEABLE FORMATIONS* 007132 P 1
PACIFIC OCEAN AREA, 1959-63, AT THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, LOWER HUTT, NEW ZEALAND.* 051171 P 22
#TRITIUM GEOPHYSICS AS AN INTERNATIONAL RESEARCH PROJECT* 040040 P 16
RADIOLOGICAL-SAFETY FEASIBILITY STUDIES, ATLANTIC-PACIFIC INTEROCEANIC CANAL. HYDROGEN BUDGET AND COMPARTMENTS IN 053779 P 23
#LIQUID INJECTION INTO DEEP PERMEABLE FORMATIONS* 007132 P 1
#TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* 065163 P 30
ATMOSPHERIC METHANE* #ON THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN 076901 P 38
AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE 082903 P 41
DETERMINATION OF COEFFICIENT OF RUNOFF* #TRITIUM IN INVESTIGATION OF SURFACE HYDROLOGY. EXPERIMENTAL 072304 P 34
REVIEW OF THE ENVIRONMENTAL ISOTOPES AND THEIR ROLE IN THE INVESTIGATION OF THE HYDROSPHERE.* CYCLE. PART I. 054493 P 24
#AN INVESTIGATION OF TRITIUM DECONTAMINATION* 082858 P 41
#AN INVESTIGATION OF TRITIUM DECONTAMINATION* 078450 P 39

#TRACING GROUNDWATER WITH CHLORIDE	IONS AND TRITIUM THROUGH ACID KAOLINITIC SOIL*	027025 P 12
OF TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER TOWARD	IRRIGATION WELLS IN WESTERN FRESNO COUNTY, CALIFORNIA* USE	011784 P 3
AND RADIONUCLIDE TRANSPORT AT THE CANNIKIN SITE, AMCHITKA	ISLAND, ALASKA* #EVENT-RELATED HYDROLOGY	079408 P 39
SERIES NO. 61* #LABORATORY TRAINING MANUAL ON THE USE OF	ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS	017268 P 8
THE HYDROLOGICAL CYCLE. PART I. REVIEW OF THE ENVIRONMENTAL	ISOTOPES AND THEIR ROLE IN THE INVESTIGATION OF THE	054493 P 24
ENVIRONMENTAL ISOTOPES AND #TRITIUM AND OTHER ENVIRONMENTAL	ISOTOPES IN THE HYDROLOGICAL CYCLE. PART I. REVIEW OF THE	054493 P 24
#ADSORPTION OF THREE HYDROGEN	ISOTOPES ON CHARCOAL*	019263 P 9
#SELECTED ENVIRONMENTAL STUDIES USING RADIOACTIVE	ISOTOPES*	068114 P 31
MOVEMENT OF SOIL MOISTURE TRACED BY MEANS OF HYDROGEN	ISOTOPES* #DOWNWARD	013802 P 7
#CHEMISTRY OF	ISOTOPES.*	051222 P 22
TRITIUM #SCREENING EFFECT OF CONTINENTS WHICH DETERMINE THE	ISOTOPIC COMPOSITION OF ATMOSPHERIC MOISTURE (BASED ON THE	075112 P 35
#SOURCES OF TRITIUM AND	ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT*	030129 P 13
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND	ITS BIOLOGICAL UPTAKE*	061130 P 26
#STUDY OF TRITIATED HYDROGEN AND	ITS COMPOUNDS IN THE ENVIRONMENT*	073004 P 34
AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND	ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES	076284 P 37
AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND	ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES	076284 P 37
SURVEY* #TRITIUM AND	ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE	075246 P 36
#ON THE INVENTORY OF ARTIFICIAL TRITIUM AND	ITS OCCURRENCE IN ATMOSPHERIC METHANE*	076901 P 38
OF TRITIUM IN PRECIPITATION OVER CONTINENTS AND	ITS SIGNIFICANCE TO GROUND-WATER DATING* #THE DISTRIBUTION	013903 P 7
#TRITIUM IN THE BIOSPHERE AND	ITS TRANSFER TO THE FOOD CHAIN*	074536 P 35

EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS	J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS*ENVIRONMENTAL	044471 P 19
BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT	JAN. 1 TO MAR. 31* CHALK RIVER NUCLEAR LABORATORIES,	066272 P 30
ANNUAL REPORT, ENVIRONMENTAL RESEARCH, TERRESTRIAL ECOLOGY,	JAN.-DEC. 1971* #RADIOLOGICAL PHYSICS DIVISION	075491 P 36
STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT,	JULY-DECEMBER 1970* #RADIOLOGICAL	068583 P 31

GROUNDWATER WITH CHLORIDE IONS AND TRITIUM THROUGH ACID	KAOLINITIC SOIL* #TRACING	027025 P 12
OF WATER TAGGED WITH H-2, H-3, AND O-18 THROUGH ACIDIC	KAOLINITIC SOIL* #MOVEMENT	027078 P 12
REPROCESSING PLANT* #DEPOSITION OF	KR-85 AND TRITIUM RELEASED FROM A NUCLEAR FUEL	077835 P 38
IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND	KRYPTON-85* #RELATIVE RADIOLOGICAL	082780 P 41
#NATURAL CONCENTRATION OF	KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS*	043102 P 18

BIOLOGY AND HEALTH PHYSICS DIVISION - #CHALK RIVER NUCLEAR	LABORATORIES PROGRESS REPORT, OCT. 1 TO DEC 31, 1971 -	072235 P 33
#ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR	LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION,	066272 P 30
#PACIFIC NORTHWEST	LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES*	065087 P 29
RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS SERIES NO. 61* #	LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND	017268 P 8
IN THE SOUTH PACIFIC OCEAN AREA, 1959-63, AT THE TRITIUM	LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, LOWER HUTT, NEW	051171 P 22
ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU	LAIT, EN CONDITIONS NATURELLES* #TRANSFER	064781 P 28
#THE PERCH	LAKE EVAPORATION STUDY*	059243 P 25
OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON	LAKE MICHIGAN* #EFFECTS	048899 P 21
#THE DISPERSION OF TRITIUM IN PERCH	LAKE*	003488 P 1
#TRITIUM IN CRATER	LAKE, OREGON*	064036 P 28
#HAZARDS OF THE DIFFUSION OF	LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE.*	053552 P 23
#RISK PRESENTED BY THE DIFFUSION OF	LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE*	033922 P 14
#THE RISKS PRESENT IN THE DIFFUSION OF	LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE*	043361 P 19
#TRITIUM DISTRIBUTION IN GROUND WATER AROUND	LARGE UNDERGROUND FUSION EXPLOSIONS.*	051578 P 22
#SPEECH BY CLARENCE E.	LARSON, COMMISSIONER, USAEC*	065420 P 30
#THE 1971 TRITIUM SYMPOSIUM AT	LAS VEGAS*	055111 P 24
#TRITIUM IN THE MIXED	LAYER OF THE NORTH PACIFIC OCEAN.*	053760 P 23
NATURELLES* #TRANSFER ET INCORP DU TRITIUM DANS	LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS	064781 P 28
#LOW-	LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL APPLICATIONS*	040000 P 16
#SOCIOECONOMIC IMPACT OF LOW-	LEVEL TRITIUM RELEASES TO THE ENVIRONMENT*	072960 P 34
#PERMISSIBLE	LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)*	067088 P 31
REPORT, APRIL 1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA	LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS	077945 P 38
HEALTH PHYSICS DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA	LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND	066272 P 30
#THE MOVEMENT OF TRITIUM FROM THE CHALK RIVER	LIQUID DISPOSAL AREA.*	051569 P 22
#	LIQUID INJECTION INTO DEEP PERMEABLE FORMATIONS*	007132 P 1
#EFFECTS OF NUCLEAR POWER STATIONS	LIQUID WASTE DISCHARGES ON LAKE MICHIGAN*	048899 P 21
IN D2O* #THE	LIQUID-VAPOR SEPARATION FACTOR OF DILUTE SOLUTIONS OF DTO	100297 P 42
CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER.	LIST NO. 1* #TRITIUM	051272 P 22
#TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED	LITERATURE SURVEY*	075246 P 36
SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE	LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969*	081445 P 40
OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT	LOS ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31,	082903 P 41
APPLICATIONS* #	LOW-LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL	040000 P 16
#SOCIOECONOMIC IMPACT OF	LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT*	072960 P 34
AT THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES,	LOWER HUTT, NEW ZEALAND.* PACIFIC OCEAN AREA, 1959-63,	051171 P 22

#ATMOSPHERIC PATHWAYS OF MAN-	MADE C-14, H-3, AND SR-90*	013798 P 6
ATMOSPHERE.* #AN ACCOUNT OF THE	MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE	051298 P 22
* #AN ACCOUNT OF THE	MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE	076899 P 39
#SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF	MAN AND HIS ENVIRONMENT*	075576 P 37
#PERMISSIBLE LEVELS OF TRITIUM IN	MAN AND THE ENVIRONMENT (T7721)*	067088 P 31
USES OF NUCLEAR EXPLOSIVES - TRANSFER OF TRITIUM TO	MAN FROM AN INITIAL WET DEPOSITION* SAFETY OF PEACEFUL	061927 P 27
TRITIATED WATER VAPOR* #DOSE TO	MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO	070396 P 33
MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO ANIMALS AND	MAN* #TRANSFER OF RADIOACTIVE	068619 P 32
#ATMOSPHERIC PATHWAYS OF	MAN-MADE C-14, H-3, AND SR-90*	013798 P 6

APPLICATIONS OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES.* #POTENTIAL 051840 P 23
TECHNICAL REPORTS SERIES NO. 61* #LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. 017768 P 8
#SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MAPPING WITH TRITIUM* 033384 P 14
AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*LIMITED. CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY 066272 P 30
#RADIOECOLOGICAL STUDY OF THE HUMBOLDT BAY MARINE ENVIRONMENT* 047066 P 20
MAN* #TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO ANIMALS AND 068619 P 32
PERIOD JULY 1, #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE 082903 P 41
TROPICAL RAIN FOREST.* #EXPERIMENTAL TEST OF A MATHEMATICAL MODEL PREDICTING TRITIUM MOVEMENT THROUGH A 036413 P 15
#A TECHNIQUE FOR DEMONSTRATING C- MAX OF A PLUME USING TRITIATED MOISTURE* 061201 P 26
AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (T1643)* # MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN 064776 P 29
MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM* 042995 P 17
#DOWNWARD MOVEMENT OF SOIL MOISTURE TRACED BY MEANS OF HYDROGEN ISOTOPES* 013802 P 7
WELLS IN WESTERN FRESNO COUNTY, #THE USE OF TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER TOWARD IRRIGATION 011784 P 3
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013347 P 5
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013795 P 5
#ATMOSPHERIC TRITIUM. MEASUREMENT AND APPLICATION* 016975 P 8
#RESULTS OF THE TRITIUM ACTIVITY MEASUREMENT OF SOME WATERS OF THE SOUTHWEST* 040777 P 16
II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* # MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART 020442 P 9
#LOW-LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL APPLICATIONS* 040000 P 14
OF THE MOVEMENT OF RADIONUCLIDES THROUGH SATURATED POROUS MEDIA* #STUDY 015304 P 8
OF MOVEMENT OF RADIONUCLIDES IN SOLUTION THROUGH POROUS MEDIA* #PREDICTION 004950 P 1
#BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1965* 013818 P 8
#PROCEEDINGS FROM VERMONT MEETING* 044378 P 19
VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM METABOLISM* AND COMPARTMENTS IN THE RAIN FOREST AT EL 021312 P 9
#TRITIUM DETERMINATIONS IN ATMOSPHERIC GASES AND METEORITES. FINAL REPORT.* 050988 P 21
#TRITIUM CONTENT OF ATMOSPHERIC METHANE AND ETHANE* 030457 P 13
#TRITIUM AND DEUTERIUM IN ATMOSPHERIC METHANE* 030475 P 13
OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC TRITIATED METHANE* #ROLE 030682 P 14
STATE OF TRITIUM IN THE ATMOSPHERE AND SOURCES OF TRITIATED METHANE* #CHEMICAL 013251 P 4
OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN ATMOSPHERIC METHANE* #ON THE INVENTORY 076901 P 39
METHANE* #ROLE OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC TRITIATED 030682 P 14
SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY 076284 P 37
SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY 076284 P 37
IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969* SURVEY OF TRITIUM 081445 P 40
OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* #EFFECTS 048999 P 21
FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL VARIABLES* #A SYSTEM 069396 P 33
SEDIMENTS UNDERLYING THE HANFORD RESERVATION* # MIGRATION CHARACTERISTICS OF RADIONUCLIDES THROUGH 021824 P 10
#TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* 065163 P 30
#RADIOACTIVITY IN WATER - PROJECT MILROW* 044832 P 19
#TRITIUM IN THE MIXED LAYER OF THE NORTH PACIFIC OCEAN.* 053760 P 23
FOREST.* #EXPERIMENTAL TEST OF A MATHEMATICAL MODEL PREDICTING TRITIUM MOVEMENT THROUGH A TROPICAL RAIN 036413 P 15
WHICH DETERMINE THE ISOTOPIC COMPOSITION OF ATMOSPHERIC MOISTURE (BASED ON THE TRITIUM SPACE-TIME DISTRIBUTION IN 075112 P 35
#TRACING SOIL MOISTURE AND GROUNDWATER FLOW AT THE SAVANNAH RIVER PLANT* 027021 P 11
#DOWNWARD MOVEMENT OF SOIL MOISTURE TRACED BY MEANS OF HYDROGEN ISOTOPES* 013802 P 7
VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC MOISTURE* #DAILY 047170 P 20
VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC MOISTURE* #DAILY 047270 P 21
FOR DEMONSTRATING C-MAX OF A PLUME USING TRITIATED MOISTURE* #A TECHNIQUE 061201 P 26
MORATORIUM TRITIUM GEOPHYSICS.* 050670 P 21
#TRITIUM MOVEMENT IN A TROPICAL ECOSYSTEM* 058730 P 25
#RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST* 056628 P 25
#TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST* 028588 P 12
FRESNO COUNTY, CALIFORNIA#THE USE OF TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER TOWARD IRRIGATION WELLS IN WESTERN 011784 P 3
#PREDICTION OF MOVEMENT OF RADIONUCLIDES IN SOLUTION THROUGH POROUS MEDIA* 004950 P 1
#STUDY OF THE MOVEMENT OF RADIONUCLIDES THROUGH SATURATED POROUS MEDIA* 015304 P 8
ISOTOPES* #DOWNWARD MOVEMENT OF SOIL MOISTURE TRACED BY MEANS OF HYDROGEN 013802 P 7
#UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE SHAFTS* 083190 P 42
AREA.* #THE MOVEMENT OF TRITIUM FROM THE CHALK RIVER LIQUID DISPOSAL 051569 P 22
MOVEMENT OF TRITIUM IN ECOLOGICAL SYSTEMS* 069508 P 33
ACIDIC KAOLINITIC SOIL* # MOVEMENT OF WATER TAGGED WITH H-2, H-3, AND O-18 THROUGH 027078 P 12
TEST OF A MATHEMATICAL MODEL PREDICTING TRITIUM MOVEMENT THROUGH A TROPICAL RAIN FOREST.* #EXPERIMENTAL 036413 P 15

PROGRESS REPORT, 1965* #HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION AREA, IDAHO. ANNUAL 017272 P 9
#ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION* 012287 P 4
REPORT, 1963* #HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS 008330 P 3
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966* 023297 P 10
TRITIUM IN RECENT YEARS* # NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND 043102 P 18
AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* #TRANSFER 065163 P 30
THE RADIOLOGICAL IMPLICATION OF COMMERCIAL UTILIZATION OF NATURAL GAS FROM A NUCLEAR STIMULATED WELL* ASSESSMENT OF 063371 P 27
#ENVIRONMENTAL ASPECTS OF NATURAL GAS STIMULATION EXPERIMENTS WITH NUCLEAR DEVICES* 068694 P 32
EXPERIMENTS ON TRANSFER OF RADIOACTIVE TRACERS FROM AIR TO NATURAL SURFACES* #SOME RECENT 007341 P 2
CIRCULATION OF WATER* #OXYGEN-18, DEUTERIUM, AND TRITIUM IN NATURAL WATERS AND THEIR RELATIONS TO THE GLOBAL 013293 P 4
#ACCURACY IN THE DETERMINATION OF THE TRITIUM CONTENTS OF NATURAL WATERS IN THE SOUTH PACIFIC OCEAN AREA, 1959-63, 051171 P 22
OF H-3 AND SR-90* #MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT 020442 P 9
DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER ET INCORP DU TRITIUM 064781 P 29
NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 31
#RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA* 075733 P 37
TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969* SURVEY OF 081445 P 40
#TRITIUM IN NEW YORK STATE WATERS, 1965* 033090 P 14
LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, LOWER HUTT, NEW ZEALAND.* PACIFIC OCEAN AREA, 1959-63, AT THE TRITIUM 051171 P 22
#TRITIUM IN THE MIXED LAYER OF THE NORTH PACIFIC OCEAN.* 053760 P 23
#TRITIUM IN THE SURFACE WATER OF THE NORTH PACIFIC OCEAN* 013801 P 6
TIME DISTRIBUTION IN THE ATMOSPHERIC PRECIPITATION OF THE NORTHERN HEMISPHERE)* MOISTURE (BASED ON THE TRITIUM SPACE- 075112 P 35
SCIENCES* #PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC 065087 P 29
#REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL FORMATIONS* 081106 P 40
ASPECTS OF NATURAL GAS STIMULATION EXPERIMENTS WITH NUCLEAR DEVICES* #ENVIRONMENTAL 068694 P 32

#WATER QUALITY IN FLOODED CRATERS PRODUCED BY NUCLEAR EXCAVATION.* 051130 P 21
#FALLOUT FROM NUCLEAR EXPLOSIONS. II. WORLDWIDE EFFECT* 082320 P 41
#OCEANIC DISTRIBUTION OF RADIONUCLIDES FROM NUCLEAR EXPLOSIONS* 069036 P 32
IN GROUNDWATER OF RADIONUCLIDES FROM UNDERGROUND NUCLEAR EXPLOSIONS* 007456 P 7
PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - TRANSFER OF TRITIUM TO MAN FROM AN 061927 P 27
RESOURCES.* #POTENTIAL APPLICATIONS OF NUCLEAR EXPLOSIVES IN CEVELOPMENT AND MANAGEMENT OF WATER 051840 P 23
#DEPOSITION OF KR-85 AND TRITIUM RELEASED FROM A NUCLEAR FUEL REPROCESSING PLANT* 077835 P 38
1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - #CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, OCT. 1 TO DEC 31, 072235 P 33
PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, 066272 P 30
#RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE EUREX NUCLEAR PLANT* 075309 P 36
#TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWER PLANTS* 036855 P 15
ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* #AEC COMMENTS 038641 P 15
MICHIGAN* #EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE 048899 P 21
CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (T16431* #MAXIMUM PERMISSIBLE 064776 P 29
AREA, 1959-63, AT THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, LOWER HUTT, NEW ZEALAND.* PACIFIC OCEAN 051171 P 22
IMPLICATION OF COMMERCIAL UTILIZATION OF NATURAL GAS FROM A NUCLEAR STIMULATED WELL*#AN ASSESSMENT OF THE RADIOLOGICAL 063371 P 27
#TRITIUM GEOPHYSICS FROM 1961-1962 NUCLEAR TESTS* 028902 P 12
#WORLD WIDE RADIOACTIVE FALLOUT FROM NUCLEAR TESTS-PART 1* 013712 P 5
#SECOND AEC CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS* 008303 P 2
T16431* #MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (064776 P 29

#ON THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN ATMOSPHERIC METHANE* 076901 P 38
WITH APPLICATIONS IN SOIL SCIENCE AND HYDROLOGY* #THE OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA, 043099 P 18
THE TRITIUM CONTENTS OF NATURAL WATERS IN THE SOUTH PACIFIC OCEAN AREA, 1959-63, AT THE TRITIUM LABORATORY, INSTITUTE 051171 P 22
#TRITIUM IN THE SURFACE WATER OF THE NORTH PACIFIC OCEAN* 013801 P 6
#TRITIUM IN THE MIXED LAYER OF THE NORTH PACIFIC OCEAN.* 053760 P 23
EXPLOSIONS* # OCEANIC DISTRIBUTION OF RADIONUCLIDES FROM NUCLEAR 069036 P 32
#RADIOACTIVITY IN OCEANOGRAPHY.* 052495 P 23
#TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1* 051272 P 22
DIVISION #CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, OCT. 1 TO DEC 31, 1971 - BIOLOGY AND HEALTH PHYSICS 072235 P 33
#TRITIUM IN CRATER LAKE, OREGON* 064036 P 28
PART I. REVIEW OF THE ENVIRONMENTAL ISOTOPES #TRITIUM AND OTHER ENVIRONMENTAL ISOTOPES IN THE HYDROLOGICAL CYCLE. 054493 P 24
#TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1* 051272 P 22
* #THE DISTRIBUTION OF TRITIUM IN PRECIPITATION OVER CONTINENTS AND ITS SIGNIFICANCE TO GROUND-WATER DATING 013803 P 7
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 26
OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS* 062726 P 27
VARIABLES* #A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL 069396 P 32
THEIR RELATIONS TO THE GLOBAL CIRCULATION OF WATER* # OXYGEN-18, DEUTERIUM, AND TRITIUM IN NATURAL WATERS AND 013283 P 4

AND RADIOLOGICAL-SAFETY FEASIBILITY STUDIES, ATLANTIC- PACIFIC INTEROCEANIC CANAL. HYDROGEN BUDGET AND 053779 P 23
ECOLOGIC SCIENCES* # PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, 065087 P 29
OF THE TRITIUM CONTENTS OF NATURAL WATERS IN THE SOUTH PACIFIC OCEAN AREA, 1959-63, AT THE TRITIUM LABORATORY, 051171 P 22
#TRITIUM IN THE MIXED LAYER OF THE NORTH PACIFIC OCEAN.* 053760 P 23
#TRITIUM IN THE SURFACE WATER OF THE NORTH PACIFIC OCEAN* 013901 P 6
#PRELIM STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC PROVING GROUND* 064789 P 29
STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING GROUND* #PRELIMINARY 040781 P 16
AND OTHER ENVIRONMENTAL ISOTOPES IN THE HYDROLOGICAL CYCLE. PART I. REVIEW OF THE ENVIRONMENTAL ISOTOPES AND THEIR 054493 P 24
* #MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90 020442 P 9
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 23
#WORLD WIDE RADIOACTIVE FALLOUT FROM NUCLEAR TESTS- PART 1* 013712 P 5
#ATMOSPHERIC PATHWAYS OF MAN-MADE C-14, H-3, AND SR-90* 013798 P 6
TO MAN #QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - TRANSFER OF TRITIUM 061927 P 27
#THE PERCH LAKE EVAPORATION STUDY* 059243 P 25
#THE DISPERSION OF TRITIUM IN PERCH LAKE* 003488 P 1
#LIQUID INJECTION INTO DEEP PERMEABLE FORMATIONS* 007132 P 1
EFFLUENTS FROM NUCLEAR REACTORS (T16431* #MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE 064776 P 28
T77211* # PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (067088 P 31
#PRELIM STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC PROVING GROUND* 064789 P 29
GROUND* #PRELIMINARY STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING 040781 P 16
COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TR* HYDROGEN BUDGET AND 053779 P 23
COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM METABOLISM* AND 021312 P 9
REPORT, OCT. 1 TO DEC 31, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENT RESEARCH BRANCH* PROGRESS 072235 P 33
TERRESTRIAL ECOLOGY, JAN.-DEC. 1971* #RADIOLOGICAL PHYSICS DIVISION ANNUAL REPORT. ENVIRONMENTAL RESEARCH, 075491 P 36
#BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 - JUNE 30, 1968* 030108 P 13
#ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972* 077945 P 38
CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31* 066272 P 30
#OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS* 062726 P 27
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* 043090 P 17
SOIL MOISTURE AND GROUNDWATER FLOW AT THE SAVANNAH RIVER PLANT* #TRACING 027021 P 11
KR-85 AND TRITIUM RELEASED FROM A NUCLEAR FUEL REPROCESSING PLANT* #DEPOSITION OF 077835 P 38
STUDIES OF THE ENVIRONMENT OF THE EUREX NUCLEAR PLANT* #RADIOECOLOGICAL 075309 P 36
#TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWER PLANTS* 036855 P 15
RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* #AEC COMMENTS ON TRITIUM 038641 P 15
#A TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING TRITIATED MOISTURE* 061201 P 26
#STUDY OF PROPAGATION OF ATMOSPHERIC POLLUTANTS WITH THE AID OF TRITIUM* 061104 P 26
#STUDY OF THE MOVEMENT OF RADIONUCLIDES THROUGH SATURATED POROUS MEDIA* 015304 P 8
PREDICTION OF MOVEMENT OF RADIONUCLIDES IN SOLUTION THROUGH POROUS MEDIA* # 004950 P 1
#THE POSSIBILITY OF GROUND WATER CONTAMINATION BY FALLOUT* 007620 P 2
#VELA UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.* 053221 P 23
POST-SHOT HYDROLOGIC SAFETY. PROJECT SHOAL. FINAL REPORT* 008686 P 3
DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES.* # POTENTIAL APPLICATIONS OF NUCLEAR EXPLOSIVES IN 051840 P 23
CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST 044471 P 19

#TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWER PLANTS* 036855 P 15
TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* #AEC COMMENTS ON 038641 P 15
#EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* 048899 P 21
#TRITIUM IN SOUTHERN HEMISPHERE PRECIPITATION (1952-1964).* 054496 P 24
#TRITIUM IN PRECIPITATION AT CANADIAN SITES (1953-1963).* 054494 P 24
ON THE TRITIUM SPACE-TIME DISTRIBUTION IN THE ATMOSPHERIC PRECIPITATION OF THE NORTHERN HEMISPHERE)* MOISTURE (BASED 075112 P 35
GROUND-WATER DATING* #THE DISTRIBUTION OF TRITIUM IN PRECIPITATION OVER CONTINENTS AND ITS SIGNIFICANCE TO 013803 P 7
#IN-CLOUD PRECIPITATION SCAVENGING OF TRITIATED WATER VAPOR* 080611 P 40
* #EXPERIMENTAL TEST OF A MATHEMATICAL MODEL PREDICTING TRITIUM MOVEMENT THROUGH A TROPICAL RAIN FOREST. 036413 P 15
THROUGH POROUS MEDIA* # PREDICTION OF MOVEMENT OF RADIONUCLIDES IN SOLUTION 004950 P 1
PACIFIC PROVING GROUND* # PRELIM STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN 064789 P 29
IN THE PACIFIC PROVING GROUND* # PRELIMINARY STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C 040781 P 16
THE ATMOSPHERE* #THE RISKS PRESENT IN THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN 043361 P 19
IN THE ATMOSPHERE* #RISK PRESENTED BY THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM 033922 P 14
#FALLOUT STUDIES AND THEIR RELATIONSHIP TO THE GENERAL PROBLEM OF ENVIRONMENTAL RADIOCONTAMINATION* 065107 P 29
OF THE UPPER ATMOSPHERE* # PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION 025597 P 11
PROCEEDINGS FROM VERMONT MEETING* 044378 P 19
#WATER QUALITY IN FLOODED CRATERS PRODUCED BY NUCLEAR EXCAVATION.* 051130 P 21
OF CHARACTERISTICS OF WATER BODIES WITH THE AID OF BOMB PRODUCED TRITIUM PULSES* #THE DETERMINATION 013804 P 7
THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF 044471 P 19
#ROLE OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC TRITIATED METHANE* 030692 P 14
#DESERT VEGETATION UPTAKE OF TRITIUM FROM PROJECT GASBUGGY EFFLUENT* 055002 P 24
#RADIOACTIVITY IN WATER - PROJECT MILROW* 044832 P 19
#POST-SHOT HYDROLOGIC SAFETY. PROJECT SHOAL. FINAL REPORT* 008686 P 3
#VELA UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.* 053221 P 23
#TRITIUM GEOPHYSICS AS AN INTERNATIONAL RESEARCH PROJECT* 040040 P 16
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1970* 068583 P 31
TRITIUM* #STUDY OF PROPAGATION OF ATMOSPHERIC POLLUTANTS WITH THE AID OF 061104 P 24
CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM 013347 P 5
CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM 013795 P 5
#AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* 038641 P 15
#MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM* 042995 P 17
#SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM* 013458 P 5
#SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT* 075576 P 37
OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES AND GEOCHEMISTRY 076284 P 37
OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES AND GEOCHEMISTRY 076284 P 37
STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC PROVING GROUND* #PRELIM 064789 P 29
OF THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING GROUND* #PRELIMINARY STUDIES 040781 P 16
BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TR* HYDROGEN 053779 P 23
BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM 021312 P 9
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE.* 051298 P 23
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE* 074899 P 38
OF WATER BODIES WITH THE AID OF BOMB PRODUCED TRITIUM PULSES* #THE DETERMINATION OF CHARACTERISTICS 013804 P 7

#WATER QUALITY IN FLOODED CRATERS PRODUCED BY NUCLEAR EXCAVATION.* 051130 P 21
#HAZARDS OF THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE.* 053552 P 23
#RISK PRESENTED BY THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE* 033922 P 14
#THE RISKS PRESENT IN THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE* 043361 P 19

#LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS SERIES NO. 61* 017268 P 8
#FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2* 004811 P 1
#ANNUAL REPORT, 1971. STUDIES ON THE RADIOACTIVE CONTAMINATION OF THE SEA* 079324 P 39
#PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE* 025597 P 11
#WORLD WIDE RADIOACTIVE FALLOUT FROM NUCLEAR TESTS-PART I* 013712 P 5
#SECOND AEC CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS* 009303 P 3
UPTAKE* # RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL 061130 P 24
GEOLOGICAL FORMATIONS* #REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN 081106 P 40
#SELECTED ENVIRONMENTAL STUDIES USING RADIOACTIVE ISOTOPES* 068114 P 31
ANIMALS AND MAN* . #TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO 068619 P 32
ALAMOS FOR THE PERIOD JULY 1, #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS 082903 P 41
REACTORS (T16431)* #MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR 064776 P 28
RADIOACTIVE TRACERS FOR HYDROLOGICAL WORKS* 075494 P 36
#SOME RECENT EXPERIMENTS ON TRANSFER OF RADIOACTIVE TRACERS FROM AIR TO NATURAL SURFACES* 007341 P 2
#STUDY OF RAINOUT OF RADIOACTIVITY IN ILLINOIS. SIXTH PROGRESS REPORT* 023879 P 11
#STUDY OF RAINOUT OF RADIOACTIVITY IN ILLINOIS* 017816 P 8
RADIOACTIVITY IN OCEANOGRAPHY.* 052495 P 23
RADIOACTIVITY IN WATER - PROJECT MILROW* 044832 P 19
RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA* 075733 P 37
RADIOCARBON AND TRITIUM IN THE UPPER TROPOSPHERE* 013797 P 5
THEIR RELATIONSHIP TO THE GENERAL PROBLEM OF ENVIRONMENTAL RADIOCONTAMINATION* #FALLOUT STUDIES AND 065107 P 29
NUCLEAR PLANT* # RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE EUREX 075309 P 36
RAIN FOREST* # RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL 056628 P 25
ENVIRONMENT* # RADIOECOLOGICAL STUDY OF THE HUMBOLDT BAY MARINE 047066 P 20
ENVIRONMENT* #SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS 075576 P 37
NATURAL GAS FROM A NUCLEAR STIMULATED #AN ASSESSMENT OF THE RADIOLOGICAL IMPLICATION OF COMMERCIAL UTILIZATION OF 063371 P 27
TRITIUM AND KRYPTON-85* #RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED 082780 P 41
RESEARCH, TERRESTRIAL ECOLOGY, JAN.-DEC. 1971* # RADIOLOGICAL PHYSICS DIVISION ANNUAL REPORT. ENVIRONMENTAL 075491 P 36
- TRANSFER OF TRITIUM TO MAN #QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES 061927 P 27
PROJECT, JULY-DECEMBER 1970* # RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD 068583 P 31
INTEROCEANIC CANAL. HYDROGEN BUDGET #BIOENVIRONMENTAL AND RADIOLOGICAL-SAFETY FEASIBILITY STUDIES, ATLANTIC-PACIFIC 053779 P 23
ISLAND, ALASKA* #EVENT-RELATED HYDROLOGY AND RADIONUCLIDE TRANSPORT AT THE CANNIKIN SITE, AMCHITKA 079408 P 39
#TRANSPORT OF RADIONUCLIDES BY GROUND WATER- SOME THEORETICAL ASPECTS* 009164 P 3

#OCEANIC DISTRIBUTION OF RADIONUCLIDES FROM NUCLEAR EXPLOSIONS* 069036 P 32
#DISTRIBUTION IN GROUNDWATER OF RADIONUCLIDES FROM UNDERGROUND NUCLEAR EXPLOSIONS* 007456 P 2
WASTE DISPOSAL FACILITIES* # RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT 043090 P 17
#PREDICTION OF MOVEMENT OF RADIONUCLIDES IN SOLUTION THROUGH POROUS MEDIA* 004950 P 1
#STUDY OF THE MOVEMENT OF RADIONUCLIDES THROUGH SATURATED POROUS MEDIA* 015304 P 8
RESERVATION* #MIGRATION CHARACTERISTICS OF RADIONUCLIDES THROUGH SEDIMENTS UNDERLYING THE HANFORD 021824 P 10
CONSIDERATION OF #HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO 021312 P 9
INTEROCEANIC CANAL. HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO 053779 P 23
MODEL PREDICTING TRITIUM MOVEMENT THROUGH A TROPICAL RAIN FOREST.* #EXPERIMENTAL TEST OF A MATHEMATICAL 036413 P 15
#TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST* 028688 P 12
#ECOLOGY - STUDIES OF A TROPICAL RAIN FOREST* 062853 P 17
#RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST* 056628 P 25
#SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN* 073740 P 35
#SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN* 079242 P 39
#WASHOUT OF TRITIATED WATER VAPOUR BY RAIN.* 051432 P 22
#TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1* 051272 P 22
* #STUDY OF RAINOUT OF RADIOACTIVITY IN ILLINOIS. SIXTH PROGRESS REPORT 023879 P 11
#STUDY OF RAINOUT OF RADIOACTIVITY IN ILLINOIS* 017816 P 9
STACK* #ESTIMATION OF DILUTION RATE FACTORS FOR TRITIATED WATER VAPOUR FROM A REACTOR 022972 P 10
#EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL REACTOR STACK.* 052042 P 23
#EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL REACTOR STACK.* 052042 P 23
OF DILUTION RATE FACTORS FOR TRITIATED WATER VAPOUR FROM A REACTOR STACK* #ESTIMATION 022972 P 10
REPORT, 1965* #HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION AREA, IDAHO. ANNUAL PROGRESS 017272 P 9
#ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION* 012287 P 4
1963* #HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 008330 P 3
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966* 023297 P 10
OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (T1643)* #MAXIMUM PERMISSIBLE CONCNS 064776 P 28
#NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 31
AIR TO NATURAL SURFACES* #SOME RECENT EXPERIMENTS ON TRANSFER OF RADIOACTIVE TRACERS FROM 007341 P 2
CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* #NATURAL 043102 P 18
DETONATIONS IN GEOLOGICAL FORMATIONS* # REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR 081106 P 40
THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY # REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN 081445 P 40
CANNIKIN SITE, AMCHITKA ISLAND, ALASKA* #EVENT- RELATED HYDROLOGY AND RADIONUCLIDE TRANSPORT AT THE 079408 P 39
18, DEUTERIUM, AND TRITIUM IN NATURAL WATERS AND THEIR RELATIONS TO THE GLOBAL CIRCULATION OF WATER* #OXYGEN- 013283 P 4
RADIOCONTAMINATION* #FALLOUT STUDIES AND THEIR RELATIONSHIP TO THE GENERAL PROBLEM OF ENVIRONMENTAL 065107 P 29
RELEASED TRITIUM AND KRYPTON-85* # RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY 082780 P 41
#A RELATIVE VOLATILITY OF HTO SOLUTIONS IN H2O* 043272 P 18
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 13
#DEPOSITION OF KR-85 AND TRITIUM RELEASED FROM A NUCLEAR FUEL REPROCESSING PLANT* 077835 P 38
#RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON-85* 082780 P 41
PLANTS* #AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER 038641 P 15
#THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 15
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 072960 P 34
DEC. 1971* #RADIOLOGICAL PHYSICS DIVISION ANNUAL REPORT, ENVIRONMENTAL RESEARCH, TERRESTRIAL ECOLOGY, JAN.- 075491 P 36
#ECOLOGICAL SCIENCES DIVISION ANNUAL PROGRESS REPORT, PERIOD ENDING SEPT. 30, 1971* 036248 P 15
UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.* #VELA 053221 P 23
DETERMINATIONS IN ATMOSPHERIC GASES AND METEORITES. FINAL REPORT.* #TRITIUM 050988 P 21
#BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 - JUNE 30, 1968* 030108 P 13
LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA 077945 P 38
PHYSICS DIVISION #CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, OCT. 1 TO DEC 31, 1971 - BIOLOGY AND HEALTH 072235 P 33
NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963* #HYDROLOGY OF SUBSURFACE WATER DISPOSAL, 008330 P 3
#BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1965* 013818 P 8
REACTOR TESTING STATION AREA, IDAHO. ANNUAL PROGRESS REPORT, 1965* #HYDROLOGY OF THE NATIONAL 017272 P 9
THE SEA* #ANNUAL REPORT, 1971. STUDIES ON THE RADIOACTIVE CONTAMINATION OF 079324 P 39
THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS SERIES NO. 61* #LABORATORY TRAINING MANUAL ON 017268 P 8
OF KR-85 AND TRITIUM RELEASED FROM A NUCLEAR FUEL REPROCESSING PLANT* #DEPOSITION 077835 P 38
1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENT RESEARCH BRANCH* PROGRESS REPORT, OCT. 1 TO DEC 31, 072235 P 33
#BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1965* 013818 P 8
RESEARCH. SOME RESULTS OF THE U. S. GEOLOGICAL SURVEY RESEARCH PROGRAM* #TRITIUM-HYDROLOGIC 043087 P 17
#TRITIUM GEOPHYSICS AS AN INTERNATIONAL RESEARCH PROJECT* 040040 P 16
RESEARCH PROGRAM* #TRITIUM-HYDROLOGIC RESEARCH. SOME RESULTS OF THE U. S. GEOLOGICAL SURVEY 043087 P 17
#RADIOLOGICAL PHYSICS DIVISION ANNUAL REPORT, ENVIRONMENTAL RESEARCH, TERRESTRIAL ECOLOGY, JAN.-DEC. 1971* 075491 P 36
OF RADIONUCLIDES THROUGH SEDIMENTS UNDERLYING THE HANFORD RESERVATION* #MIGRATION CHARACTERISTICS 021824 P 10
STUDIES.* # RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA 053772 P 23
RESIDUAL TRITIUM AT SEDAN CRATER* 023154 P 10
RESIDUAL TRITIUM AT SEDAN CRATER* 039157 P 16
NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES.* #POTENTIAL APPLICATIONS OF 051840 P 23
#DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* 070396 P 33
OF THE SOUTHWEST* # RESULTS OF THE TRITIUM ACTIVITY MEASUREMENT OF SOME WATERS 040777 P 16
#TRITIUM-HYDROLOGIC RESEARCH. SOME RESULTS OF THE U. S. GEOLOGICAL SURVEY RESEARCH PROGRAM* 043087 P 17
ENVIRONMENTAL ISOTOPES IN THE HYDROLOGICAL CYCLE. PART I. REVIEW OF THE ENVIRONMENTAL ISOTOPES AND THEIR ROLE IN THE 054493 P 24
#TRITIUM IN ECOLOGY. A REVIEW.* 053417 P 23
AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TR* HYDROGEN BUDGET 053779 P 23
AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM METABOLISM* 021312 P 9
#DATING TRITIUM DISPERSAL IN GROUND WATER BY TREE RING ANALYSIS.* 051276 P 22
#TRITIUM AND CARBON-14 IN THE TREE RINGS* 043106 P 18
TRITIUM IN THE ATMOSPHERE* # RISK PRESENTED BY THE DIFFUSION OF LARGE QUANTITIES OF 033922 P 14
TRITIUM IN THE ATMOSPHERE* #THE RISKS PRESENT IN THE DIFFUSION OF LARGE QUANTITIES OF 043361 P 19
#THE MOVEMENT OF TRITIUM FROM THE CHALK RIVER LIQUID DISPOSAL AREA.* 051569 P 22
31, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - #CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, OCT. 1 TO DEC 072235 P 33
DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS 066272 P 30
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* 043090 P 17
#TRACING SOIL MOISTURE AND GROUNDWATER FLOW AT THE SAVANNAH RIVER PLANT* 027021 P 11
TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING 013795 P 5
TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING 013347 P 5
#TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1* 051272 P 22
PART I. REVIEW OF THE ENVIRONMENTAL ISOTOPES AND THEIR ROLE IN THE INVESTIGATION OF THE HYDROSPHERE.* CYCLE. 054493 P 24
TRITIATED METHANE* # ROLE OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC 030682 P 14

HYDROLOGY. EXPERIMENTAL DETERMINATION OF COEFFICIENT OF RUNOFF* #TRITIUM IN INVESTIGATION OF SURFACE 072304 P 34

#TRITIUM-HYDROLOGIC RESEARCH. SOME RESULTS OF THE U. S. GEOLOGICAL SURVEY RESEARCH PROGRAM* 043087 P 17
CANAL. HYDROGEN BUDGET #BIOENVIRONMENTAL AND RADIOLOGICAL- SAFETY FEASIBILITY STUDIES. ATLANTIC-PACIFIC INTEROCEANIC 053779 P 23
OF TRITIUM TO #QUARTERLY PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - TRANSFER 061927 P 27
#VELA UNIFORM. PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.* 053221 P 23
#POST-SHOT HYDROLOGIC SAFETY. PROJECT SHOAL. FINAL REPORT* 008686 P 3
#STUDY OF THE MOVEMENT OF RADIONUCLIDES THROUGH SATURATED POROUS MEDIA* 015304 P 8
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* 043090 P 17
#TRACING SOIL MOISTURE AND GROUNDWATER FLOW AT THE SAVANNAH RIVER PLANT* 027021 P 11
HYDROLOGY* #THE OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA. WITH APPLICATIONS IN SOIL SCIENCE AND 043099 P 18
SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN* 073740 P 35
SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN* 079242 P 39
#TROPOSPHERIC SCAVENGING OF SR90 AND H3* 060857 P 26
#IN-CLOUD PRECIPITATION SCAVENGING OF TRITIATED WATER VAPOR* 080611 P 40
TRITIUM THROUGHOUT SCANDINAVIA. WITH APPLICATIONS IN SOIL SCIENCE AND HYDROLOGY* #THE OCCURRENCE OF C-14 AND 043099 P 18
SEPT. 30, 1971* #ECOLOGICAL SCIENCES DIVISION ANNUAL PROGRESS REPORT. PERIOD ENDING 036248 P 15
NORTHWEST LABORATORY ANNUAL REPORT FOR 1970. ECOLOGIC SCIENCES* #PACIFIC 065087 P 29
1959-63. AT THE TRITIUM LABORATORY. INSTITUTE OF NUCLEAR SCIENCES. LOWER HUTT. NEW ZEALAND.* PACIFIC OCEAN AREA. 051171 P 22
#EXPERIENCES USING TRITIUM IN SCIENTIFIC HYDROLOGY* 013805 P 7
ISOTOPIC COMPOSITION OF ATMOSPHERIC MOISTURE (BASED ON THE # SCREENING EFFECT OF CONTINENTS WHICH DETERMINE THE 075112 P 35
1971. STUDIES ON THE RADIOACTIVE CONTAMINATION OF THE SEA* #ANNUAL REPORT. 079324 P 39
WEAPONS TESTS* # SECOND AEC CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR 008303 P 2
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 23
#RESIDUAL TRITIUM AT SEDAN CRATER* 023154 P 10
#RESIDUAL TRITIUM AT SEDAN CRATER* 039157 P 16
#MIGRATION CHARACTERISTICS OF RADIONUCLIDES THROUGH SEDIMENTS UNDERLYING THE HANFORD RESERVATION* 021824 P 10
SELECTED ENVIRONMENTAL STUDIES USING RADIOACTIVE ISOTOPES* 068114 P 31
#TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY* 075246 P 36
SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM* 013458 P 5
#THE LIQUID-VAPOR SEPARATION FACTOR OF DILUTE SOLUTIONS OF DTO IN D2O* 100297 P 42
SCIENCES DIVISION ANNUAL PROGRESS REPORT. PERIOD ENDING SEPT. 30, 1971* #ECOLOGICAL 036248 P 15
OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL REPORTS SERIES NO. 61* #LABORATORY TRAINING MANUAL ON THE USE 017268 P 8
#UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE SHAFTS* 083190 P 42
#POST-SHOT HYDROLOGIC SAFETY. PROJECT SHOAL. FINAL REPORT* 008686 P 3
#VELA UNIFORM. PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.* 053221 P 23
#VELA UNIFORM. PROJECT SHOAL. POST- SHOT HYDROLOGIC SAFETY. FINAL REPORT.* 053221 P 23
#POST- SHOT HYDROLOGIC SAFETY. PROJECT SHOAL. FINAL REPORT* 008686 P 3
#THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 15
OF TRITIUM IN PRECIPITATION OVER CONTINENTS AND ITS SIGNIFICANCE TO GROUND-WATER DATING* #THE DISTRIBUTION 013803 P 7
TRITIUM* # SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MAPPING WITH 033384 P 14
#TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 4
HYDROLOGY AND RADIONUCLIDE TRANSPORT AT THE CANNIKIN SITE. AMCHITKA ISLAND. ALASKA* #EVENT-RELATED 079408 P 39
#TRITIUM IN PRECIPITATION AT CANADIAN SITES (1953-1963).* 054494 P 24
#STUDY OF RAINOUT OF RADIOACTIVITY IN ILLINOIS. SIXTH PROGRESS REPORT* 023879 P 11
#TRITIUM CONTENT OF ANTARCTIC SNOW.* 050855 P 21
ENVIRONMENT* # SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE 072960 P 34
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 23
PLANT* #TRACING SOIL MOISTURE AND GROUNDWATER FLOW AT THE SAVANNAH RIVER 027021 P 11
#DOWNWARD MOVEMENT OF SOIL MOISTURE TRACED BY MEANS OF HYDROGEN ISOTOPES* 013802 P 7
#TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST* 028688 P 12
14 AND TRITIUM THROUGHOUT SCANDINAVIA. WITH APPLICATIONS IN SOIL SCIENCE AND HYDROLOGY* #THE OCCURRENCE OF C- 043099 P 18
WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE* #CONTRIBUTION OF TRITIATED 027023 P 11
#CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE* 027023 P 11
TAGGED WITH H-2. H-3. AND O-18 THROUGH ACIDIC KAOLINITIC SOIL* #MOVEMENT OF WATER 027078 P 12
WITH CHLORIDE IONS AND TRITIUM THROUGH ACID KAOLINITIC SOIL* #TRACING GROUNDWATER 027025 P 12
#DIFFUSION OF TRITIATED WATER IN SOILS.* 051562 P 22
#UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE SHAFTS* 083190 P 42
#PREDICTION OF MOVEMENT OF RADIONUCLIDES IN SOLUTION THROUGH POROUS MEDIA* 004950 P 1
#A RELATIVE VOLATILITY OF HTO SOLUTIONS IN H2O* 043272 P 18
#THE LIQUID-VAPOR SEPARATION FACTOR OF DILUTE SOLUTIONS OF DTO IN D2O* 100297 P 42
FROM AIR TO NATURAL SURFACES* # SOME RECENT EXPERIMENTS ON TRANSFER OF RADIOACTIVE TRACERS 007341 P 2
PROGRAM* #TRITIUM-HYDROLOGIC RESEARCH. SOME RESULTS OF THE U. S. GEOLOGICAL SURVEY RESEARCH 043087 P 17
#TRANSPORT OF RADIONUCLIDES BY GROUND WATER- SOME THEORETICAL ASPECTS* 009164 P 3
#RESULTS OF THE TRITIUM ACTIVITY MEASUREMENT OF SOME WATERS OF THE SOUTHWEST* 040777 P 16
AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO 076284 P 37
AND ITS DISTRIBUTIVE PROVINCE* #CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO 076284 P 37
#CHEMICAL STATE OF TRITIUM IN THE ATMOSPHERE AND SOURCES OF TRITIATED METHANE* 013251 P 4
ENVIRONMENT* # SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE 030129 P 13
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 26
OF THE TRITIUM CONTENTS OF NATURAL WATERS IN THE SOUTH PACIFIC OCEAN AREA. 1959-63. AT THE TRITIUM 051171 P 22
#TRITIUM IN SOUTHERN HEMISPHERE PRECIPITATION (1953-1964).* 054496 P 24
#A COMPARISON OF TRITIUM AND SR-90 FALLOUT IN THE SOUTHERN HEMISPHERE* 060477 P 26
#A COMPARISON OF TRITIUM AND STRONTIUM-90 FALLOUT IN THE SOUTHERN HEMISPHERE* 032094 P 14
OF THE TRITIUM ACTIVITY MEASUREMENT OF SOME WATERS OF THE SOUTHWEST* #RESULTS 040777 P 16
COMPOSITION OF ATMOSPHERIC MOISTURE (BASED ON THE TRITIUM SPACE-TIME DISTRIBUTION IN THE ATMOSPHERIC PRECIPITATION 075112 P 35
SPEECH BY CLARENCE E. LARSON. COMMISSIONER. USAEC* 065420 P 30
#A COMPARISON OF TRITIUM AND SR-90 FALLOUT IN THE SOUTHERN HEMISPHERE* 060477 P 26
#ATMOSPHERIC PATHWAYS OF MAN-MADE C-14. H-3. AND SR-90* 013798 P 6
PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* #MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. 020442 P 9
#TROPOSPHERIC SCAVENGING OF SR90 AND H3* 060857 P 26
#SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MAPPING WITH TRITIUM* 033384 P 14
RATE FACTORS FOR TRITIATED WATER VAPOUR FROM A REACTOR STACK* #ESTIMATION OF DILUTION 022972 P 10
EXPERIENCE WITH DILUTION RATE FACTORS FROM THE AECL REACTOR STACK.* # 052042 P 23
TRITIATED METHANE* #CHEMICAL STATE OF TRITIUM IN THE ATMOSPHERE AND SOURCES OF 013251 P 4

#TRITIUM IN NEW YORK STATE WATERS, 1965* 033090 P 14
TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968-DEC. 1969* #EVALUATION OF 055973 P 24
#TRITIUM IN STREAMS IN THE UNITED STATES, 1961-1968* 057383 P 25
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION AREA, IDAHO. ANNUAL PROGRESS REPORT, 1965* 017272 P 9
TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION* #ENVIRONMENTAL 012287 P 4
OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963* #HYDROLOGY 008330 P 3
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966* 023297 P 10
#EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* 048899 P 21
JULY-DECEMBER 1970* #RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, 068583 P 31
OF COMMERCIAL UTILIZATION OF NATURAL GAS FROM A NUCLEAR STIMULATED WELL*ASSESSMENT OF THE RADIOLOGICAL IMPLICATION 063371 P 27
#ENVIRONMENTAL ASPECTS OF NATURAL GAS STIMULATION EXPERIMENTS WITH NUCLEAR DEVICES* 068694 P 32
#UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE SHAFTS* 083190 P 42
#TRITIUM IN STREAMS IN THE UNITED STATES, 1961-1968* 057383 P 25
#A COMPARISON OF TRITIUM AND STRONTIUM-90 FALLOUT IN THE SOUTHERN HEMISPHERE* 032094 P 14
ENVIRONMENTAL RADIOCONTAMINATION* #FALLOUT STUDIES AND THEIR RELATIONSHIP TO THE GENERAL PROBLEM OF 065107 P 29
#ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION* 012287 P 4
#ECOLOGY - STUDIES OF A TROPICAL RAIN FOREST* 042853 P 17
#GEOCHEMICAL STUDIES OF CONTINENTAL WATERS* 064035 P 28
PROVING GROUND* #PRELIM STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC 064789 P 29
#RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE EUREX NUCLEAR PLANT* 075309 P 36
PACIFIC PROVING GROUND* #PRELIMINARY STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C IN THE 040781 P 16
#RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST* 056628 P 25
#ANNUAL REPORT, 1971. STUDIES ON THE RADIOACTIVE CONTAMINATION OF THE SEA* 079324 P 39
#SELECTED ENVIRONMENTAL STUDIES USING RADIOACTIVE ISOTOPES* 068114 P 31
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 18
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES.* 051169 P 22
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 23
#BIOENVIRONMENTAL AND RADIOLOGICAL-SAFETY FEASIBILITY STUDIES, ATLANTIC-PACIFIC INTEROCEANIC CANAL. HYDROGEN 053779 P 23
AID OF TRITIUM* # STUDY OF PROPAGATION OF ATMOSPHERIC POLLUTANTS WITH THE 061104 P 26
#PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE* 025597 P 11
PROGRESS REPORT* # STUDY OF RAINOUT OF RADIOACTIVITY IN ILLINOIS. SIXTH 023879 P 11
STUDY OF RAINOUT OF RADIOACTIVITY IN ILLINOIS* 017816 P 9
#RADIOECOLOGICAL STUDY OF THE HUMBOLDT BAY MARINE ENVIRONMENT* 047066 P 20
POROUS MEDIA* # STUDY OF THE MOVEMENT OF RADIONUCLIDES THROUGH SATURATED 015304 P 9
ENVIRONMENT* # STUDY OF TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE 073004 P 34
#THE PERCH LAKE EVAPORATION STUDY* 059243 P 25
STATION, IDAHO. ANNUAL PROGRESS REPORT, 1963* #HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING 008330 P 3
MEXICO, AUGUST 1966 THROUGH #REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW 081445 P 40
COEFFICIENT OF RUNOFF* #TRITIUM IN INVESTIGATION OF SURFACE HYDROLOGY. EXPERIMENTAL DETERMINATION OF 072304 P 34
#TRITIUM IN THE SURFACE WATER OF THE NORTH PACIFIC OCEAN* 013801 P 6
DEC. 1969* #EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968- 055973 P 24
WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE* #CONTRIBUTION OF TRITIATED 027023 P 11
ON TRANSFER OF RADIOACTIVE TRACERS FROM AIR TO NATURAL SURFACES* #SOME RECENT EXPERIMENTS 007341 P 2
#AN ECOLOGICAL APPROACH TO ENVIRONMENTAL SURVEILLANCE* 065109 P 30
ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY #REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS 081445 P 40
HYDROLOGIC RESEARCH. SOME RESULTS OF THE U. S. GEOLOGICAL SURVEY RESEARCH PROGRAM* #TRITIUM- 043087 P 17
AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY* #TRITIUM 075246 P 36
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 24
AND HIS ENVIRONMENT* # SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN 075576 P 37
VEGETATION WITH MICROMETEOROLOGICAL VARIABLES* #A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN 069396 P 33
#MOVEMENT OF TRITIUM IN ECOLOGICAL SYSTEMS* 069508 P 33

SOIL* #MOVEMENT OF WATER TAGGED WITH H-2, H-3, AND O-18 THROUGH ACIDIC KAOLINITIC 027078 P 12
TRITIATED MOISTURE* #A TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING 061201 P 26
#SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MAPPING WITH TRITIUM* 033384 P 14
GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF 013795 P 5
GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF 013347 P 5
PHYSICS DIVISION ANNUAL REPORT. ENVIRONMENTAL RESEARCH, TERRESTRIAL ECOLOGY, JAN.-DEC. 1971* #RADIOLOGICAL 075491 P 36
#TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO ANIMALS AND MAN* 068619 P 32
#RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA* 075733 P 37
THROUGH A TROPICAL RAIN FOREST.* #EXPERIMENTAL TEST OF A MATHEMATICAL MODEL PREDICTING TRITIUM MOVEMENT 036413 P 15
#TRITIUM UPTAKE FOLLOWING A THERMONUCLEAR TEST* 045087 P 20
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION AREA, IDAHO. ANNUAL PROGRESS REPORT, 1965* 017272 P 9
#ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION* 012287 P 4
#HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963* 008330 P 3
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966* 023297 P 10
#TRITIUM GEOPHYSICS FROM 1961-1962 NUCLEAR TESTS* 028902 P 12
AEC CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS* #SECOND 008303 P 2
#WORLD WIDE RADIOACTIVE FALLOUT FROM NUCLEAR TESTS-PART 1* 013712 P 5
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE.* 051298 P 22
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE* 076899 P 38
#OXYGEN-18, DEUTERIUM, AND TRITIUM IN NATURAL WATERS AND THEIR RELATIONS TO THE GLOBAL CIRCULATION OF WATER* 013283 P 4
RADIOCONTAMINATION* #FALLOUT STUDIES AND THEIR RELATIONSHIP TO THE GENERAL PROBLEM OF ENVIRONMENTAL 065107 P 29
CYCLE. PART I. REVIEW OF THE ENVIRONMENTAL ISOTOPES AND THEIR ROLE IN THE INVESTIGATION OF THE HYDROSPHERE.* 054493 P 24
#TRANSPORT OF RADIONUCLIDES BY GROUND WATER- SOME THEORETICAL ASPECTS* 009164 P 3
#TRITIUM UPTAKE FOLLOWING A THERMONUCLEAR TEST* 045087 P 20
#ADSORPTION OF THREE HYDROGEN ISOTOPES ON CHARCOAL* 019263 P 9
TEST OF A MATHEMATICAL MODEL PREDICTING TRITIUM MOVEMENT THROUGH A TROPICAL RAIN FOREST.* #EXPERIMENTAL 036413 P 15
#TRACING GROUNDWATER WITH CHLORIDE IONS AND TRITIUM THROUGH ACID KAOLINITIC SOIL* 027025 P 12
#MOVEMENT OF WATER TAGGED WITH H-2, H-3, AND O-18 THROUGH ACIDIC KAOLINITIC SOIL* 027078 P 12
DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31, 1972* OF RADIOACTIVE MATERIALS IN WASTE 082903 P 41
WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969* SURVEY OF TRITIUM IN SURFACE AND GROUND 081445 P 40
#PREDICTION OF MOVEMENT OF RADIONUCLIDES IN SOLUTION THROUGH POROUS MEDIA* 004950 P 1
#STUDY OF THE MOVEMENT OF RADIONUCLIDES THROUGH SATURATED POROUS MEDIA* 015304 P 8
#MIGRATION CHARACTERISTICS OF RADIONUCLIDES THROUGH SEDIMENTS UNDERLYING THE HANFORD RESERVATION* 021824 P 10

AND HYDROLOGY* #THE OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA, WITH APPLICATIONS IN SOIL SCIENCE 043099 P 18
#DISPERSION IN TIDAL ESTUARIES* 006736 P 1
OF ATMOSPHERIC MOISTURE (BASED ON THE TRITIUM SPACE- TIME DISTRIBUTION IN THE ATMOSPHERIC PRECIPITATION OF THE 075112 P 35
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES.* 051169 P 22
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 18
#THE USE OF TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER TOWARD IRRIGATION WELLS IN WESTERN FRESNO COUNTY, 011784 P 3
AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TR* HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST 053779 P 23
#DOWNWARD MOVEMENT OF SOIL MOISTURE TRACED BY MEANS OF HYDROGEN ISOTOPES* 013802 P 7
ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE TRACER* #GRAPHICAL EVALUATION OF EXPERIMENTS TO DETERMINE 074336 P 35
#RADIOACTIVE TRACERS FOR HYDROLOGICAL WORKS* 075494 P 36
#SOME RECENT EXPERIMENTS ON TRANSFER OF RADIOACTIVE TRACERS FROM AIR TO NATURAL SURFACES* 007341 P 2
ACID KAOLINITIC SOIL* # TRACING GROUNDWATER WITH CHLORIDE IONS AND TRITIUM THROUGH 027025 P 12
RIVER PLANT* # TRACING SOIL MOISTURE AND GROUNDWATER FLOW AT THE SAVANNAH 027021 P 11
ENTOMOLOGY. TECHNICAL REPORTS SERIES NO. 61* #LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN 017268 P 8
UNDER NATURAL CONDITIONS* # TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK 065163 P 30
HERBE ET DU LAIT, EN CONDITIONS NATURELLES* # TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L 064781 P 28
ENVIRONMENT TO ANIMALS AND MAN* # TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL 068619 P 32
SURFACES* #SOME RECENT EXPERIMENTS ON TRANSFER OF RADIOACTIVE TRACERS FROM AIR TO NATURAL 007341 P 2
SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - TRANSFER OF TRITIUM TO MAN FROM AN INITIAL WET DEPOSITION* 061927 P 27
#DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* 070396 P 33
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 35
#EVENT-RELATED HYDROLOGY AND RADIONUCLIDE TRANSPORT AT THE CANNIKIN SITE, AMCHITKA ISLAND, ALASKA* 079408 P 39
#A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL VARIABLES* 069396 P 33
THEORETICAL ASPECTS* # TRANSPORT OF RADIONUCLIDES BY GROUND WATER- SOME 009164 P 3
#DATING TRITIUM DISPERSAL IN GROUND WATER BY TREE RING ANALYSIS.* 051276 P 22
#TRITIUM AND CARBON-14 IN THE TREE RINGS* 043106 P 18
TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 4
#STUDY OF TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT* 073004 P 34
#CHEMICAL STATE OF TRITIUM IN THE ATMOSPHERE AND SOURCES OF TRITIATED METHANE* 013251 P 4
#RCLE OF METHYLENE IN THE PRODUCTION OF ATMOSPHERIC TRITIATED METHANE* 030682 P 14
#A TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING TRITIATED MOISTURE* 061201 P 26
#OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS* 062726 P 27
TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES.* 051169 P 22
TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 18
AT THE SOIL SURFACE* #CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION 027023 P 11
#DIFFUSION OF TRITIATED WATER IN SOILS.* 051562 P 22
OF EXPERIMENTS TO DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE TRACER* #GRAPHICAL EVALUATION 074336 P 35
#IN-CLOUD PRECIPITATION SCAVENGING OF TRITIATED WATER VAPOR* 080611 P 40
TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* #DOSE 070396 P 33
#WASHOUT OF TRITIATED WATER VAPOUR BY RAIN.* 051432 P 22
#ESTIMATION OF DILUTION RATE FACTORS FOR TRITIATED WATER VAPOUR FROM A REACTOR STACK* 022972 P 10
#HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER* 061721 P 27
CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 #MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART II. 020442 P 9
SOUTHWEST* #RESULTS OF THE TRITIUM ACTIVITY MEASUREMENT OF SOME WATERS OF THE 040777 P 16
#PRELIM STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC PROVING GROUND* 064789 P 29
TRITIUM AND CARBON-14 IN THE TREE RINGS* 043106 P 18
TRITIUM AND DEUTERIUM IN ATMOSPHERIC METHANE* 030475 P 13
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 13
LITERATURE SURVEY* # TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED 075246 P 36
#ON THE INVENTORY OF ARTIFICIAL TRITIUM AND ITS OCCURRENCE IN ATMOSPHERIC METHANE* 076901 P 38
RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON-85* #RELATIVE 082780 P 41
HYDROLOGICAL CYCLE. PART I. REVIEW OF THE ENVIRONMENTAL # TRITIUM AND OTHER ENVIRONMENTAL ISOTOPES IN THE 054493 P 24
#A COMPARISON OF TRITIUM AND SR-90 FALLOUT IN THE SOUTHERN HEMISPHERE* 060477 P 26
* #A COMPARISON OF TRITIUM AND STRONTIUM-90 FALLOUT IN THE SOUTHERN HEMISPHERE 032094 P 14
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE.* 051298 P 22
#AN ACCOUNT OF THE MAJOR PULSES OF TRITIUM AND THEIR EFFECTS IN THE ATMOSPHERE* 076899 P 38
#PRELIMINARY STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING GROUND* 040781 P 16
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 23
#RESIDUAL TRITIUM AT SEDAN CRATER* 039157 P 16
#RESIDUAL TRITIUM AT SEDAN CRATER* 023154 P 10
#SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN* 079242 P 39
#SCAVENGING OF GASEOUS TRITIUM COMPOUNDS BY RAIN* 073740 P 35
WATER. LIST NO. 1* # TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER 051272 P 22
#DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC MOISTURE* 047270 P 21
#DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC MOISTURE* 047170 P 20
THE PROPORTIONAL-COUNTING TECHNIQUE* # TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH 013367 P 5
THE PROPORTIONAL-COUNTING TECHNIQUE* # TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH 013795 P 5
#THE HAZARD FROM TRITIUM CONTAMINATION* 057579 P 25
TRITIUM CONTENT OF ANTARCTIC SNOW.* 050855 P 21
TRITIUM CONTENT OF ATMOSPHERIC METHANE AND ETHANE* 030457 P 13
OCEAN AREA, 1959-63, #ACCURACY IN THE DETERMINATION OF THE TRITIUM CONTENTS OF NATURAL WATERS IN THE SOUTH PACIFIC 051171 P 22
CONDITIONS NATURELLES* #TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN 064781 P 28
#AN INVESTIGATION OF TRITIUM DECONTAMINATION* 082858 P 41
#AN INVESTIGATION OF TRITIUM DECONTAMINATION* 078450 P 39
METEORITES. FINAL REPORT.* # TRITIUM DETERMINATIONS IN ATMOSPHERIC GASES AND 050988 P 21
#DATING TRITIUM DISPERSAL IN GROUND WATER BY TREE RING ANALYSIS.* 051276 P 22
UNDERGROUND FUSION EXPLOSIONS.* # TRITIUM DISTRIBUTION IN GROUND WATER AROUND LARGE 051578 P 22
#DESERT VEGETATION UPTAKE OF TRITIUM FROM PROJECT GASBUGGY EFFLUENT* 055002 P 24
#UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE SHAFTS* 083190 P 42
#THE MOVEMENT OF TRITIUM FROM THE CHALK RIVER LIQUID DISPOSAL AREA.* 051569 P 22
TRITIUM GEOPHYSICS AS AN INTERNATIONAL RESEARCH PROJECT* 040040 P 16
TRITIUM GEOPHYSICS FROM 1961-1962 NUCLEAR TESTS* 028902 P 12
#MORATORIUM TRITIUM GEOPHYSICS.* 050670 P 21
TRITIUM IN CRATER LAKE, OREGON* 064036 P 28
#MOVEMENT OF TRITIUM IN ECOLOGICAL SYSTEMS* 069508 P 33
TRITIUM IN ECOLOGY. A REVIEW.* 053417 P 23
STATES, APRIL 1968-DEC. 1969* #EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED 055973 P 24
EXPERIMENTAL DETERMINATION OF COEFFICIENT OF RUNOFF* # TRITIUM IN INVESTIGATION OF SURFACE HYDROLOGY. 072304 P 34

#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 31
GLOBAL CIRCULATION OF WATER* #OXYGEN-18, DEUTERIUM, AND TRITIUM IN NATURAL WATERS AND THEIR RELATIONS TO THE 013283 P 4
TRITIUM IN NEW YORK STATE WATERS, 1965* 033090 P 14
#THE DISPERSION OF TRITIUM IN PERCH LAKE* 003488 P 1
TRITIUM IN PRECIPITATION AT CANADIAN SITES (1953-1963).* 054494 P 24
SIGNIFICANCE TO GROUND-WATER DATING* #THE DISTRIBUTION OF TRITIUM IN PRECIPITATION OVER CONTINENTS AND ITS 013803 P 7
#NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* 043102 P 18
#EXPERIENCES USING TRITIUM IN SCIENTIFIC HYDROLOGY* 013805 P 7
TRITIUM IN SOUTHERN HEMISPHERE PRECIPITATION (1953-1964).* 054496 P 24
TRITIUM IN STREAMS IN THE UNITED STATES, 1961-1968* 057383 P 25
AREA, NEW MEXICO, AUGUST 1966 THROUGH #REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS 081445 P 40
#CHEMICAL STATE OF TRITIUM IN THE ATMOSPHERE AND SOURCES OF TRITIATED METHANE* 013251 P 4
#HAZARDS OF THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE.* 053552 P 23
#THE RISKS PRESENT IN THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE* 043361 P 19
#RISK PRESENTED BY THE DIFFUSION OF LARGE QUANTITIES OF TRITIUM IN THE ATMOSPHERE* 033922 P 14
* # TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN 074536 P 35
# TRITIUM IN THE ENVIRONMENT FROM NUCLEAR POWER PLANTS* 036855 P 15
* #CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE 076284 P 37
* #CONTEMPORARY SOURCES AND GEOCHEMISTRY OF TRITIUM IN THE GULF OF MEXICO AND ITS DISTRIBUTIVE PROVINCE 076284 P 37
# TRITIUM IN THE MIXED LAYER OF THE NORTH PACIFIC OCEAN.* 053760 P 23
# TRITIUM IN THE SURFACE WATER OF THE NORTH PACIFIC OCEAN* 013801 P 6
#RADIOCARBON AND TRITIUM IN THE UPPER TROPOSPHERE* 013797 P 5
ATMOSPHERE* # TRITIUM INJECTION AND CONCENTRATION DISTRIBUTION IN THE 045485 P 20
#TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* 065163 P 30
WATERS IN THE SOUTH PACIFIC OCEAN AREA, 1959-63, AT THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, LOWER 051171 P 22
#LOW-LEVEL TRITIUM MEASUREMENTS FOR HYDROLOGICAL APPLICATIONS* 040000 P 16
AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM METABOLISM* AND COMPARTMENTS IN THE RAIN FOREST 021312 P 9
TRITIUM MOVEMENT IN A TROPICAL ECOSYSTEM* 058730 P 25
#RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST* 056628 P 25
TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST* 028688 P 12
#EXPERIMENTAL TEST OF A MATHEMATICAL MODEL PREDICTING TRITIUM MOVEMENT THROUGH A TROPICAL RAIN FOREST.* 036413 P 15
MICROMETEOROLOGICAL VARIABLES* #A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH 069396 P 33
OF WATER BODIES WITH THE AID OF BOMB PRODUCED TRITIUM PULSES* #THE DETERMINATION OF CHARACTERISTICS 013804 P 7
#DEPOSITION OF KR-85 AND TRITIUM RELEASED FROM A NUCLEAR FUEL REPROCESSING PLANT* 077835 P 38
POWER PLANTS* #AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR 038641 P 15
#THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 15
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 072960 P 34
#TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 4
ISOTOPIC COMPOSITION OF ATMOSPHERIC MOISTURE (BASED ON THE TRITIUM SPACE-TIME DISTRIBUTION IN THE ATMOSPHERIC 075112 P 35
#ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION* 012287 P 4
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 24
#TRACING GROUNDWATER WITH CHLORIDE IONS AND TRITIUM THROUGH ACID KAOLINITIC SOIL* 027025 P 12
SCIENCE AND HYDROLOGY* #THE OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA, WITH APPLICATIONS IN SOIL 043099 P 18
SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - TRANSFER OF TRITIUM TO MAN FROM AN INITIAL WET DEPOSITION*RADIOLOGICAL 061927 P 27
IRRIGATION WELLS IN WESTERN FRESNO COUNTY, #THE USE OF TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER TOWARD 011784 P 3
#OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS* 062726 P 27
TRITIUM UPTAKE FOLLOWING A THERMONUCLEAR TEST* 045087 P 20
#MEANS OF DETECTING AND PROTECTING AGAINST TRITIUM* 042995 P 17
#SIMPLIFIED TECHNIQUE FOR STACK DISPERSION MAPPING WITH TRITIUM* 033384 P 14
#SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM* 013458 P 5
#1964 HURRICANE TRITIUM* 013800 P 6
TRITIUM* 077191 P 38
#ENVIRONMENTAL BURDENING BY TRITIUM* 072991 P 34
#CERTAIN ENVIRONMENTAL ASPECTS OF TRITIUM* 082301 P 40
OF PROPAGATION OF ATMOSPHERIC POLLUTANTS WITH THE AID OF TRITIUM* #STUDY 061104 P 26
#ATMOSPHERIC TRITIUM, MEASUREMENT AND APPLICATION* 016975 P 8
GEOLOGICAL SURVEY RESEARCH PROGRAM* # TRITIUM-HYDROLOGIC RESEARCH. SOME RESULTS OF THE U. S. 043087 P 17
#TRITIUM MOVEMENT IN A TROPICAL ECOSYSTEM* 058730 P 25
A MATHEMATICAL MODEL PREDICTING TRITIUM MOVEMENT THROUGH A TROPICAL RAIN FOREST.* #EXPERIMENTAL TEST OF 036413 P 15
#ECOLOGY - STUDIES OF A TROPICAL RAIN FOREST* 042853 P 17
#RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST* 056628 P 25
#TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST* 028688 P 12
#RADIOCARBON AND TRITIUM IN THE UPPER TROPOSPHERE* 013797 P 5
TROPOSPHERIC SCAVENGING OF SR90 AND H3* 060857 P 26
NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (T1643)* #MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE 064776 P 28
#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 31

#TRITIUM-HYDROLOGIC RESEARCH. SOME RESULTS OF THE U. S. GEOLOGICAL SURVEY RESEARCH PROGRAM* 043087 P 17
PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF 044471 P 19
#TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* 065163 P 30
#TRITIUM DISTRIBUTION IN GROUND WATER AROUND LARGE UNDERGROUND FUSION EXPLOSIONS.* 051578 P 22
SHAFTS* # UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE 083190 P 42
#DISTRIBUTION IN GROUNDWATER OF RADIONUCLIDES FROM UNDERGROUND NUCLEAR EXPLOSIONS* 007456 P 2
CHARACTERISTICS OF RADIONUCLIDES THROUGH SEDIMENTS UNDERLYING THE HANFORD RESERVATION* #MIGRATION 021824 P 10
REPORT.* #VELA UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL 053221 P 23
OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968-DEC. 1969* #EVALUATION 055973 P 24
#TRITIUM IN STREAMS IN THE UNITED STATES, 1961-1968* 057383 P 25
#SOURCES OF TRITIUM AND ITS BEHAVIOR UPON RELEASE TO THE ENVIRONMENT* 030129 P 13
ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE* #PROBLEMS 025597 P 11
#RADIOCARBON AND TRITIUM IN THE UPPER TROPOSPHERE* 013797 P 5
#TRITIUM UPTAKE FOLLOWING A THERMONUCLEAR TEST* 045087 P 20
#DESERT VEGETATION UPTAKE OF TRITIUM FROM PROJECT GASBUGGY EFFLUENT* 055002 P 24
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 26
#SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC* 065420 P 30
REPORTS SERIES NO. 61* #LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ENTOMOLOGY. TECHNICAL 017268 P 9

TOWARD IRRIGATION WELLS IN WESTERN FRESNO COUNTY, #THE USE OF TRITIUM TO MEASURE THE MOVEMENT OF GROUNDWATER 011784 P 3
PROGRESS REPORT ON RADIOLOGICAL SAFETY OF PEACEFUL USES OF NUCLEAR EXPLOSIVES - TRANSFER OF TRITIUM TO MAN 061927 P 27
#SELECTED ENVIRONMENTAL STUDIES USING RADIOACTIVE ISOTOPES* 068114 P 31
#A TECHNIQUE FOR DEMONSTRATING C-MAX OF A PLUME USING TRITIATED MOISTURE* 061201 P 26
#EXPERIENCES USING TRITIUM IN SCIENTIFIC HYDROLOGY* 013805 P 7
AN ASSESSMENT OF THE RADIOLOGICAL IMPLICATION OF COMMERCIAL UTILIZATION OF NATURAL GAS FROM A NUCLEAR STIMULATED WELL*# 063371 P 27

TO DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE TRACER* #GRAPHICAL EVALUATION OF EXPERIMENTS 074336 P 35
#THE LIQUID- VAPOR SEPARATION FACTOR OF DILUTE SOLUTIONS OF DTO IN D2O* 100297 P 42
#IN-CLOUD PRECIPITATION SCAVENGING OF TRITIATED WATER VAPOR* 080611 P 40
CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* #DOSE TO MAN VIA FOOD- 070396 P 33
#WASHOUT OF TRITIATED WATER VAPOUR BY RAIN.* 051432 P 22
#ESTIMATION OF DILUTION RATE FACTORS FOR TRITIATED WATER VAPOUR FROM A REACTOR STACK* 022972 P 10
OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL VARIABLES* #A SYSTEM FOR CORRELATING TRITIUM 069396 P 33
MOISTURE* #DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC 047270 P 21
MOISTURE* #DAILY VARIATIONS IN THE TRITIUM CONCENTRATION OF ATMOSPHERIC 047170 P 20
#CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE* 027023 P 11
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 24
* #DESERT VEGETATION UPTAKE OF TRITIUM FROM PROJECT GASBUGGY EFFLUENT 055002 P 24
#A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL VARIABLES* 069396 P 33
FINAL REPORT.* # VELA UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. 053221 P 23
HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TR* 053779 P 23
#HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM 021312 P 9
#PROCEEDINGS FROM VERMONT MEETING* 044378 P 19
TRITIATED WATER VAPOR* #DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO 070396 P 33
#A RELATIVE VOLATILITY OF HTO SOLUTIONS IN H2O* 043272 P 18

WASHOUT OF TRITIATED WATER VAPOUR BY RAIN.* 051432 P 22
1972 #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 082903 P 41
#EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* 048899 P 21
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* 043090 P 17
#UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID- WASTE STORAGE SHAFTS* 083190 P 42
#RADIOACTIVITY IN WATER - PROJECT MILROW* 044832 P 19
#OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS* 062726 P 27
#TRITIUM DISTRIBUTION IN GROUND WATER AROUND LARGE UNDERGROUND FUSION EXPLOSIONS.* 051578 P 22
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES.* 051169 P 22
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 18
SURFACE* #CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL 027023 P 11
#THE DETERMINATION OF CHARACTERISTICS OF WATER BODIES WITH THE AID OF BOMB PRODUCED TRITIUM PULSES* 013804 P 7
#DATING TRITIUM DISPERSAL IN GROUND WATER BY TREE RING ANALYSIS.* 051276 P 22
#THE POSSIBILITY OF GROUND WATER CONTAMINATION BY FALLOUT* 007620 P 2
OVER CONTINENTS AND ITS SIGNIFICANCE TO GROUND- WATER DATING*#THE DISTRIBUTION OF TRITIUM IN PRECIPITATION 013803 P 7
ANNUAL PROGRESS REPORT, 1963* #HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, 008330 P 3
#DIFFUSION OF TRITIATED WATER IN SOILS.* 051562 P 22
THROUGH #REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 081445 P 40
#TRITIUM IN THE SURFACE WATER OF THE NORTH PACIFIC OCEAN* 013801 P 6
EXCAVATION.* # WATER QUALITY IN FLOODED CRATERS PRODUCED BY NUCLEAR 051130 P 21
OF NUCLEAR EXPLOSIVES IN DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES.* #POTENTIAL APPLICATIONS 051840 P 23
KAOLINITIC SOIL* #MOVEMENT OF WATER TAGGED WITH H-2, H-3, AND O-18 THROUGH ACIDIC 027078 P 12
TO DETERMINE ATMOSPHERIC DISPERSION WITH TRITIATED WATER VAPOR AS THE TRACER* EVALUATION OF EXPERIMENTS 074336 P 35
#IN-CLOUD PRECIPITATION SCAVENGING OF TRITIATED WATER VAPOR* 080611 P 40
FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* #DOSE TO MAN VIA 070396 P 33
#WASHOUT OF TRITIATED WATER VAPOUR BY RAIN.* 051432 P 22
#ESTIMATION OF DILUTION RATE FACTORS FOR TRITIATED WATER VAPOUR FROM A REACTOR STACK* 022972 P 10
#HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER* 061721 P 27
WATERS AND THEIR RELATIONS TO THE GLOBAL CIRCULATION OF WATER* #OXYGEN-18, DEUTERIUM, AND TRITIUM IN NATURAL 013283 P 4
#TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1* 051272 P 22
#TRANSPORT OF RADIONUCLIDES BY GROUND WATER- SOME THEORETICAL ASPECTS* 009164 P 3
#RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA* 075733 P 37
#FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2* 004811 P 1
WATER* #OXYGEN-18, DEUTERIUM, AND TRITIUM IN NATURAL WATERS AND THEIR RELATIONS TO THE GLOBAL CIRCULATION OF 013283 P 4
IN THE DETERMINATION OF THE TRITIUM CONTENTS OF NATURAL WATERS IN THE SOUTH PACIFIC OCEAN AREA, 1959-63, AT THE 051171 P 22
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013347 P 5
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013795 P 5
#RESULTS OF THE TRITIUM ACTIVITY MEASUREMENT OF SOME WATERS OF THE SOUTHWEST* 040777 P 16
#EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968-DEC. 1969* 055973 P 24
#GEOCHEMICAL STUDIES OF CONTINENTAL WATERS* 064035 P 28
AND SR-90* #MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 020442 P 9
#TRITIUM IN NEW YORK STATE WATERS, 1965* 033090 P 14
#SECOND AEC CONFERENCE ON RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS* 008303 P 2
UTILIZATION OF NATURAL GAS FROM A NUCLEAR STIMULATED WELL* OF THE RADIOLOGICAL IMPLICATION OF COMMERCIAL 063371 P 27
TO MEASURE THE MOVEMENT OF GROUNDWATER TOWARD IRRIGATION WELLS IN WESTERN FRESNO COUNTY, CALIFORNIA* USE OF TRITIUM 011784 P 3
THE MOVEMENT OF GROUNDWATER TOWARD IRRIGATION WELLS IN WESTERN FRESNO COUNTY, CALIFORNIA* OF TRITIUM TO MEASURE 011784 P 3
#EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968-DEC. 1969* 055973 P 24
EXPLOSIVES - TRANSFER OF TRITIUM TO MAN FROM AN INITIAL WET DEPOSITION* SAFETY OF PEACEFUL USES OF NUCLEAR 061927 P 27
MOISTURE (BASED ON THE #SCREENING EFFECT OF CONTINENTS WHICH DETERMINE THE ISOTOPIC COMPOSITION OF ATMOSPHERIC 075112 P 35
#WORLD WIDE RADIOACTIVE FALLOUT FROM NUCLEAR TESTS-PART 1* 013712 P 5
#RADIOACTIVE TRACERS FOR HYDROLOGICAL WORKS* 075494 P 36
WORLD WIDE RADIOACTIVE FALLOUT FROM NUCLEAR TESTS-PART 1* 013712 P 5
#FALLOUT FROM NUCLEAR EXPLOSIONS. II. WORLDWIDE EFFECT* 082320 P 41

OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* ØNATURAL CONCENTRATION 063102 P 18
ØTRITIUM IN NEW YORK STATE WATERS, 1965* 033090 P 14

LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, LOWER HUTT, NEW ZEALAND.*SOUTH PACIFIC OCEAN AREA, 1959-63, AT THE TRITIUM 051171 P 22

VI Biological Behavior

VI - BIOLOGICAL BEHAVIOR

012939
ELWOOD JW
TRITIUM BEHAVIOR IN FISH FROM A CHRONICALLY CONTAMINATED LAKE
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-710501-45 +. 13 PAGES, FROM THE 3RD NATIONAL SYMPOSIUM ON RADIOECOLOGY, OAK RIDGE, TENNESSEE, MAY 10, 1971

AFTER EXPOSURE OF FISH TO CONTAMINATED LAKE WATER FOR ABOUT 2 YEARS, THE BIOLOGICAL HALF-LIVES OF TRITIUM WERE 0.2 HR FOR 96% OF THAT IN BODY WATER, 0.9 HR FOR THE REMAINING 4% IN BODY WATER, AND 8.7 DAYS FOR ALL BUT A VERY SMALL FRACTION OF THAT WHICH WAS ORGANICALLY BOUND IN TISSUE. IT APPEARED THAT UNDER EQUILIBRIUM CONDITIONS THE CONCENTRATION FACTOR WAS LESS THAN 1.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ORNL + LAKE + *RADIONUCLIDE UPTAKE + *ANIMAL, FISH + SPECIFIC ACTIVITY + RADIATION EXPOSURE, CHRONIC + CONCENTRATION FACTOR

013458
SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM
SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE
CONF-640413 +. 138 PAGES, TABLES, SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM, LE VESINET, FRANCE, APRIL 16-18, 1964, IN FRENCH

THE 23 PAPERS, TOGETHER WITH THE DISCUSSIONS FOLLOWING THEIR PRESENTATION, PRESENTED AT THE SEMINAR AT LE VESINET ON PROTECTION AGAINST THE DANGERS OF TRITIUM ARE COMPILED.

AVAILABILITY - SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE, FREE.

FISSION PRODUCT RELEASE

013818
BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1965
ARGONNE NATIONAL LABORATORY
ANL-7136 +. 342 PAGES, FIGURES, TABLES, REFERENCES, DECEMBER 1965

PROGRESS IS REPORTED FOR THE YEAR 1965 FOR RESEARCH IN THE AREA OF RADIATION BIOLOGY. A LIST OF PUBLICATIONS BY MEMBERS OF THE RESEARCH STAFF OF THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION IS GIVEN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $7.00 CY, $1.75 MN

*CRUSTACEAN + CESIUM + ECOLOGY + DOSIMETRY + RADIATION DAMAGE + RADIATION SAFETY AND CONTROL + X-RAY + GAMMA + NEUTRON + SPECTROMETRY, GAMMA + RADIATION PROTECTION, CHEMICAL + *RADIATION EFFECT

016938
LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA
STI-DOC-10/60 +. 196 PAGES, 42 FIGURES, 10 TABLES, 6 REFERENCES, TECHNICAL REPORTS SERIES NO. 60, AUGUST 1966

THIS MANUAL CONTAINS LECTURE MATERIAL AND LABORATORY EXERCISES APPLICABLE TO A BASIC COURSE ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH. BASIC CONCEPTS OF NUCLEAR PHYSICS, RADIATION DETECTION, AND HEALTH PHYSICS ARE DISCUSSED, AND APPLICATIONS OF THE BASIC PRINCIPLES ARE DISCUSSED. EIGHTEEN LABORATORY EXERCISES ARE GIVEN TO ILLUSTRATE THE USE OF VARIOUS RADIATION DETECTION INSTRUMENTS. 13 OTHERS COVER TRACER STUDIES IN RATS, DOGS, AND FROGS. ONE SHOWS THE ACUTE EFFECTS OF RADIATION ON RATS. THE MATERIAL IS WELL ORGANIZED, AND EACH SECTION IS FOLLOWED BY A BIBLIOGRAPHY. THE APPENDIXES PRESENT INFORMATION PERTINENT TO THE STUDIES.

AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY, NEW YORK OR GENEVA, $4.00 COPY

BIOMEDICAL + ECOLOGY + COUNTER + DECONTAMINATION + *HEALTH PHYSICS TRAINING + TRACER, RADIOACTIVE + ANIMAL + *CONCENTRATION + *RADIATION EFFECT + RADIATION MONITORS

018273
NELSON, V
COLUMBIA RIVER STUDIES 1969-1970, APPENDIX, EFFECTS OF TEMPERATURE AND RADIATION UPON LARVAE OF A PACIFIC OYSTER
UNIVERSITY OF WASHINGTON, SEATTLE
RLO-2225-TL-2 +. 2 PAGES, JUNE 22, 1970

SIGNIFICANT INCREASES IN LARVAL ABNORMALITIES OCCUR AT 28 C, AND DOSE EFFECTS OCCUR FROM BOTH ZN-65 AND H-3 UPTAKE. CONCNS. OF 10(-3RD) CI/LITER OF H-3 OR OF 10(-4RTH CI/LITER OF ZN-65 GAVE A DOSE OF ABOUT 0.3-0.4 RADS/DAY WHICH CAUSED THE ABNORMALITIES. SURVIVAL LESSENED AS THE REARING TEMPERATURE INCREASED FROM 20-28 C, BUT SURVIVAL WAS NOT AFFECTED BY DOSE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

018273 *CONTINUED*
ZINC + *RADIONUCLIDE UPTAKE + *ANIMAL, INVERTEBRATE + BIOACCUMULATION/TURNOVER + AQUATIC ORGANISM + *GROWTH/DEVELOPMENT

021312
ODUM HT
HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM METABOLISM
PUERTO RICO NUCLEAR CENTER, MAYAGUEZ
BMI-171-002 +. 36 PAGES, TABLES, REFERENCES, JUNE 1, 1967

FROM DATA ON RAINFALL, THROUGHFALL, STEAMFLOW, EVAPORATION, TRANSPIRATION, PERCOLATION, PHOTOSYNTHESIS, AND RESPIRATION FROM THE MONTANE FOREST AT EL VERDE, PUERTO RICO, A HYDROGEN COMPARTMENTAL DIAGRAM WITH FLOW RATES AND COMPARTMENTAL STORAGES WAS PREPARED. THE DIAGRAM PERMITS COMPUTATION OF TRANSIENT PHENOMENA FOR THE FLOW OF TRITIUM IN A TROPICAL FOREST, ASSUMING A KNOWLEDGE OF THE EXTENT AND THE DURATION OF THE TRACER INPUT. A MATHEMATICAL MODEL FOR TRITIUM TRANSFER, BASED UPON THIS DIAGRAM, IS GIVEN IN THE APPENDIX. THE STORY AT EL VERDE IS FOUND TO BE SOMEWHAT COMPARABLE TO THAT OF PANAMA DURING ITS WET SEASON BECAUSE THEIR RAINFALL AND SATURATION DEFICITS ARE SIMILAR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

ECOLOGY + *PLOWSHARE + *EXCAVATION, NUCLEAR

023154
KORANDA JJ
RESIDUAL TRITIUM AT SEDAN CRATER
CALIFORNIA UNIV., LIVERMORE. LAWRENCE RADIATION LAB.
UCRL-70292 + CONF-670503-9 +. 36 PAGES, APRIL 2, 1967, PRESENTED AT 2ND NATIONAL SYMPOSIUM ON RADIOECOLOGY, ANN ARBOR, MICHIGAN

RESIDUAL TRITIUM FROM THE SEDAN THERMONUCLEAR DETONATION, 6 JULY 1962, WAS SCAVENGED BY OR ENTRAINED IN THE 5-6 MILLION TONS OF EARTH MATERIALS MOVED BY THE DETONATION. AS A RESULT, THE SEDAN POST-SHOT ENVIRONMENT CONTAINED A MOST SIGNIFICANT BIOLOGICAL TRACER IN THE FORM OF THO. RESIDUAL TRITIUM (THO) IS FOUND IN MICROCURIE CONCENTRATIONS IN THE INTERSTITIAL WATER OF THE SEDAN THROWOUT SOIL, AND IN THE LOOSE TISSUE WATER OF PLANTS WHICH HAVE RE-INVADED THE NEW SUBSTRATUM DEPOSITED ON THE LANDSCAPE ADJACENT TO THE CRATER. TRITIUM IS PRESENT NOT ONLY IN THE LOOSE TISSUE WATER OF VASCULAR PLANTS GROWING ON THE SEDAN THROWOUT, BUT A COMPARABLE LEVEL IS ALSO FOUND IN THE TISSUE-BOUND HYDROGEN OF THESE PLANTS. HERBIVORES, MAINLY HETEROMYID RODENTS, WHICH HAVE RE-INVADED THE SEDAN POST-SHOT ENVIRONMENT AND RESIDE THERE, ALSO HAVE TRITIUM CONCENTRATIONS IN THEIR BODY WATER BETWEEN 1 AND 3 MICROCURIE/ML. THESE BODY-WATER TRITIUM CONCENTRATIONS ARE CLOSELY RELATED TO THE LEVELS OF TRITIUM IN THE PLANT TISSUE-BOUND HYDROGEN. THE INTERNAL DOSE TO THE RESIDENT MAMMAL AT SEDAN CRATER FROM RESIDUAL TRITIUM IS ESTIMATED TO BE BETWEEN 18 AND 268 RAD, OR ABOUT 10 TIMES THAT FROM EXTERNAL RADIATION SOURCES RESULTING FROM THE DETONATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

CRUSTACEAN + BIOMEDICAL + *ECOLOGY + HYDROGEN + *DIETARY HABIT + *NUCLEAR DETONATION

026846
ERICKSON RC
THE EFFECTS OF CHRONIC IRRADIATION BY TRITIATED WATER ON POECILIA RETICULATE, THE GUPPY
UNIVERSITY OF WASHINGTON, SEATTLE
NVO-269-15 + CONF-710501-38 +. PAPER PRESENTED AT A SYMPOSIUM, MAY 10, 1970

GUPPIES WERE REARED IN TRITIATED WATER (HTO). THE OBJECTIVES WERE TO CHARACTERIZE SUBLETHAL EFFECTS OF CHRONIC IRRADIATION AND TO EVALUATE THE EFFECTS OF A RANGE OF HTO CONCENTRATIONS ON DEVELOPMENT AND BEHAVIOR. SIGNIFICANT EFFECTS WERE AN INCREASED PROPORTION OF MALES AND AN EARLIER APPEARANCE OF MALE SEX CHARACTERS IN FISH EXPOSED TO THE LOWEST HTO CONCENTRATION USED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ANIMAL, FISH + BEHAVIOR + CONCENTRATION + *RADIATION EFFECT, SPECIES + *RADIATION EXPOSURE, CHRONIC + *EFFECT, DOSE + *EFFECT, SEX

027023
COREY JC
CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE
SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S. C.
DP-MS-67-95 +. 23 PAGES, 7 FIGURES, 2 TABLES, 16 REFERENCES, PRESENTED AT THE SYMPOSIUM ON ENVIRONMENTAL SURVEILLANCE IN THE VICINITY OF NUCLEAR FACILITIES, JANUARY 24-25, 1968, AUGUSTA, GEORGIA

TRITIATED WATER DEPOSITED ON THE SOIL RETURNS DIRECTLY TO THE ATMOSPHERE BY EVAPORATION FROM THE SOIL SURFACE AND BY TRANSPIRATION BY PLANTS. THE TIME FOR TRITIATED WATER TO EVAPORATE FROM A LOAMY SAND WAS MEASURED WHEN TRITIATED WATER WAS PLACED 0 TO 14, 14 TO 28, OR 28 TO 42 CM BELOW THE SURFACE AND FOR SOIL WATER CONTENTS OF 0.05 AND 0.10 G/G OF OVEN-DRY SOIL. THE EVAPORATION

027023 *CONTINUED*
TIME INCREASED WITH THE DEPTH OF PLACEMENT AND WITH A DECREASE IN WATER CONTENT. TRITIATED WATER 14 TO 28 CM BELOW THE SOIL SURFACE DID NOT EVAPORATE BEFORE 60 HR. TRITIATED WATER 28 TO 42 CM BELOW THE SOIL SURFACE DID NOT EVAPORATE BEFORE 200 HR FROM SOIL WET TO 0.10 G/G OF OVEN-DRY SOIL. AND NOT BEFORE 300 HR FROM SOIL WET TO 0.05 G/G OF OVEN-DRY SOIL.

AVAILABILITY - J.C. COREY, SAVANNAH RIVER LABORATORY, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, S.C. 29801

*ECOLOGY + DEPOSITION + *EVAPORATION + *SOIL

028688
KLINE JR + JORDAN CF
TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST
PUERTO RICO NUCLEAR CENTER, CAPARRA HEIGHTS STATION, SAN JUAN
2 PAGES, 2 FIGURES, 6 REFERENCES, SCIENCE, 160, PAGES 550-51 (MAY 3, 1968)

TRITIATED WATER APPLIED TO THE SURFACE OF SOIL IN A TROPICAL RAIN FOREST WAS FOUND IN FREE WATER OF THE LITTER AND TOP 18 CENTIMETERS OF SOIL AS LONG AS 7 MONTHS AFTER THE APPLICATION. PLANT ROOTS, EVEN IN THE HIGH-RAINFALL ENVIRONMENT OF A TROPICAL RAIN FOREST, THEREFORE ARE EXPOSED TO TRIATED WATER FOR CONSIDERABLE PERIODS OF TIME AFTER RELEASE.

*ECOLOGY + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *RADIATION MODEL + RADIONUCLIDE, INDUCED + VEGETATION + CONCENTRATION

037402
KORANDA JJ + AHSPAUGH LR + MARTIN JR
THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
13 PAGES, 8 FIGURES, 4 TABLES, 26 REFERENCES, IEEE TRANSACTIONS ON NUCLEAR SCIENCE, 19(1), PP. 27-39 (FEBRUARY 1972)

TRITIUM IS PRODUCED NATURALLY AND WAS PRESENT IN LOW CONCENTRATIONS IN PRECIPITATION AND NATURAL BODIES OF WATER BEFORE ATMOSPHERIC TESTING OF NUCLEAR WEAPONS. OTHER SOURCES OF TRITIUM ARE NOW PRESENT FROM WHICH TRITIUM IS RELEASED TO THE ENVIRONMENT. NUCLEAR REACTOR TRITIUM PRODUCTION, ACCORDING TO RECENT ESTIMATES, WILL EQUAL NATURAL TRITIUM PRODUCTION BEFORE THE YEAR 2000. PREDICTED INCREASES OF TRITIUM IN THE ENVIRONMENT WILL TAKE PLACE FIRST ON A LOCAL ECOLOGICAL LEVEL AND THEN APPEAR ON A BIOSHPERIC LEVEL. ITS BEHAVIOR IN THE ENVIRONMENT IS DISCUSSED.

*ECOLOGY + *WATER + *EVAPORATION + *HYDROLOGY + *PRECIPITATION + *RADIOACTIVITY RELEASE + ENVIRONMENT + WATER VAPOR + BEHAVIOR + *TRANSPIRATION + VAPOR EXCHANGE

038641
AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS
CONGRESS OF THE UNITED STATES
6 PAGES, PG 505-510 OF JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES, 1969

AT THESE HEARINGS CONCERN WAS EXPRESSED BY INTERESTED CITIZENS AS TO THE POSSIBLE ENVIRONMENTAL EFFECTS THAT MIGHT RESULT FROM ROUTINE RELEASES OF LOW LEVELS OF RADIOACTIVE HYDROGEN (TRITIUM) INTO THE BAY. THE BIOLOGICAL EFFECTS, IF ANY, OF EXPOSURES TO SUCH A LOW LEVEL WOULD BE TOO SMALL TO BE DETECTED, EVEN IF VERY LARGE POPULATIONS WERE EXPOSED, AND WOULD HAVE NO ECOLOGICAL SIGNIFICANCE. IN DERIVING LIMITS FOR TRITIUM APPLICABLE TO MEMBERS OF THE GENERAL PUBLIC, THESE EXPERT GROUPS HAVE TAKEN INTO ACCOUNT THE UNIQUE ENERGY AND ABSORPTION PROPERTIES OF TRITIUM AS THEY RELATE TO DISTRIBUTION OF THE DOSE IN BODY TISSUE.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*NRC QUESTION + ECOLOGY + REACTOR, PWR + *POPULATION EXPOSURE + *CALVERT CLIFFS 1 (PWR) + CALVERT CLIFFS 2 (PWR)

040664
HATCH FT + MAZRIMAS JA + GREENWAY GG + KORANDA JJ + MOORE JL
STUDIES ON LIVER DNA IN TRITIATED KANGAROO RAT LIVING AT SEDAN CRATER
CALIFORNIA UNIVERSITY, LIVERMORE, LAWRENCE RADIATION LABORATORY
UCRL-50461 +. 28 PAGES, JULY 10, 1968

KANGAROO RATS LIVING NEAR THE CRATER OF AN OLD NUCLEAR DETONATION WERE FOUND TO BE UNIFORMLY TRITIATED. THE LIFETIME CHRONIC DOSE TO ADULT ANIMALS WAS ESTIMATED TO BE 10 RAD FROM INTERNAL H-3 AND 10 RAD FROM PERSISTENT EXTERNAL BETA- AND GAMMA-EMITTING RADIONUCLIDES. LIVER DNA WAS ISOLATED FROM THESE ANIMALS AND FROM CONTROL ANIMALS TRAPPED IN AREAS NOT ENRICHED IN RADIONUCLIDES. DNA FROM THE CRATER ANIMALS CONTAINED 6,000,000 DPM/G HYDROGEN. IN COMPARISON WITH CONTROL DNA, THE CRATER DNA EXHIBITED THE FOLLOWING - MORE PROTEIN AND HISTONE, LOWER MOLE FRACTION OF A + T NUCLEOTIDES, INCREASED TEMPLATE ACTIVITY RNA AND 1 DNA POLYMERASE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

NUCLEAR DETONATION + ANIMAL, VERTEBRATE + RADIATION EXPOSURE, CHRONIC + DNA + AMINO ACID + MAMMAL, RAT + *LIVER + PROTEIN + RNA

040665
ROHWER PS
RADIATION EFFECTS UPON WATER ABSORPTION AND EXCRETION IN THE RAT
UNIVERSITY OF ROCHESTER, N. Y.
135 PAGES, THESIS, 1967

WHOLE BODY X-IRRADIATION HAS A SIGNIFICANT EFFECT ON GASTROINTESTINAL ABSORPTION OF TRITIATED WATER IN THE RAT. THE IMPAIRMENT INCREASED STEADILY WITH MINIMAL ABSORPTION OCCURRING ON DAY 3. THE FOURTH POST-IRRADIATION DAY WAS CHARACTERIZED BY AN ABRUPT RECOVERY WITH TRITIATED WATER ABSORPTION RETURNING TO CONTROL LEVELS. NO ALTERATION IN TRITIATED WATER ABSORPTION WAS OBSERVED BEYOND DAY 3 IN THE 21 DAY POST-IRRADIATION PERIOD STUDIED. FOLLOWING A 1500 R EXPOSURE, THE ABSORPTION OF TRITIATED WATER WAS EVEN LESS THAN THAT SEEN IN RATS IRRADIATED WITH 750 R. WITH THE SUPRALETHAL EXPOSURE, THIS IMPAIRMENT INCREASED STEADILY UNTIL DEATH OF THE ANIMALS ENSUED.

ABSORPTION + BIOLOGICAL HALF-LIFE + LETHAL DOSE + RECOVERY + RADIATION EFFECT + MAMMAL, RAT + GI TRACT

040666
PACHLER PF
EVIDENCE AGAINST THE ALTERNATION OF SYNTHESIS OF IDENTICAL CHROMOSOMES IN ESCHERICHIA COLI GROWING AT LOW RATES
INDIANA UNIVERSITY, BLOOMINGTON
7 PAGES, JOURNAL OF MOLECULAR BIOLOGY, VOLUME 28, PAGES 531-7 (SEPTEMBER 28, 1967)

SLOWLY GROWING CELLS IN MEDIUM CONTAINING SUCCINATE AS A CARBON SOURCE WERE LABELED FOR ABOUT HALF A GENERATION AND ABOUT TWO GENERATIONS WITH H(3)-THYMINE, AND THE SURVIVAL ON STORAGE AT LIQUID-NITROGEN TEMPERATURE WAS FOLLOWED. CELLS IN BOTH SAMPLES WERE INACTIVATED IN A FIRST-ORDER WAY. THE SURVIVAL CURVES SHOWED NO TENDENCY TO LEVEL OFF, EVEN WHEN SURVIVAL WAS FOLLOWED INTO THE FOURTH DECADE. THIS IS EVIDENCE AGAINST ALTERNATE SYNTHESIS OF IDENTICAL CHROMOSOMES IN THESE CELLS, A CONCLUSION SUPPORTED BY THE FACT THAT THE FINAL SLOPE OF THE SURVIVAL CURVE WAS PROPORTIONAL TO THE AMOUNT OF SELF-IRRADIATION OF THE RADIATION-SENSITIVE TARGET.

BACTERIA + CHROMOSOMAL EFFECT + CELL + CULTURE + DURATION, GENERATION

040667
MONESI V + CRIPPA M + BIGNAMI R
THE STAGE OF CHROMOSOME DUPLICATION IN THE CELL CYCLE AS REVEALED BY X-RAY BREAKAGE AND 3H-THYMIDINE LABELING
CENTRO STUDI NUCLEARI, CASACCIA, ITALY
18 PAGES, CHROMOSOMA, VOLUME 21, PAGES 369-86 (1967)

EXPERIMENTS WITH X IRRADIATION AND H(3)-THYMIDINE LABELING OF THE CHROMOSOMES IN THE DNA SYNTHESIS PHASE, AND SUBSEQUENT ANALYSIS AT METAPHASE OF THE AUTORADIOGRAPHS OF THE CHROMOSOMAL DAMAGE INDUCED DURING INTERPHASE, ARE REPORTED. IT WAS SHOWN THAT IN SOMATIC CELLS FROM A QUASI-DIPLOID CHINESE HAMSTER LINE CULTERED IN VITRO THE CHROMOSOMES CHANGED THEIR RESPONSE TO RADIATION FROM SINGLE TO DOUBLE IN LATE G-SUB-1. THESE RESULTS INDICATED THAT THE CHROMOSOME DIVIDED INTO TWO CHROMATIDS IN G-SUB-1, BEFORE DNA REPLICATION. BY EXTENDING THE OBSERVATIONS TO THE SECOND METAPHASE AFTER IRRADIATION, IT WAS SHOWN THAT CELLS IRRADIATED WHILE IN G-SUB-2, OR LATE S, STILL EXHIBITED MANY CHROMATID EXCHANGES, SOME OF WHICH WERE LABELED.

RADIOGRAPHY + GAMMA EMITTER + CHROMOSOMAL EFFECT + EFFECT, SOMATIC + DNA + CELL + CULTURE + MITOSIS + MUTATION

040668
PILGRIM C + LENNARTZ KJ + WEGENER KJ + HOLLWEG S + MAURER W
AUTORADIOGRAPHIC INVESTIGATION OF DIURNAL FLUCTUATIONS IN THE 3H-INDEX AND THE MITOTIC INDEX IN CELL TYPES OF ADULT MICE, RAT FETUSES, ASCITES TUMOR CELLS
UCRL-TRANS-10211 +. 39 PAGES, TRANSLATED FROM ZEITSCHRIFT FUER ZELLFORSCHUNG UND MIKROSKOPISCHE ANATOMIE, VOLUME 68, PAGES 138-54 (1965)

DIURNAL FLUCTUATIONS IN THE UPTAKE OF INJECTED TRITIUM, USED AS A LABEL FOR THYMIDINE, AND THE MITOTIC INDEX WERE INVESTIGATED IN 10 DIFFERENT CELL TYPES OF NORMAL MICE, IN FIVE FETAL CELL TYPES AND IN THREE ASCITES TUMORS. THE ANIMALS WERE SACRIFICED 40 MINUTES AFTER INJECTION OF H(3)-THYMIDINE. AUTORADIOGRAPHS WERE PREPARED FROM VARIOUS ORGANS. DIURNAL FLUCTUATIONS OF DNA SYNTHESIS, AS INDICATED BY THE UPTAKE OF TRITIUM-LABELED THYMIDINE, WERE OBSERVED IN A NUMBER OF CELL TYPES OF THE ADULT ANIMAL, ASIDE FROM THE DIURNAL FLUCTUATIONS OF THE MITOTIC INDEX. THESE H(3)-INDEX FLUCTUATIONS WERE FOUND WITHOUT EXCEPTION IN ALL CELL TYPES IN WHICH DIURNAL FLUCTUATIONS OF THE MITOTIC INDEX WERE OBSERVED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

RADIOGRAPHY + CELL + MAMMAL, RAT + FETUS + MITOSIS + TUMOR

040669
PELC SR + APPLETON TC
DISTRIBUTION OF TRITIATED THYMIDINE IN ANIMALS AS SHOWN BY WATER-SOLUBLE AUTORADIOGRAPHY
MEDICAL RESEARCH COUNCIL, LONDON (ENGLAND)
EUR-3290F-E +. 10 PAGES, PP. 29-38

A NEW TECHNIQUE IS DESCRIBED FOR STUDYING THE INCORPORATION OF LABELED SOLUBLE COMPOUNDS IN WHICH

040669 *CONTINUED*
THE LABELED MATERIAL IS IMMOBILIZED. NO MATERIALS THAT MIGHT LEACH OUT SOLUBLE COMPOUNDS ARE USED UNTIL AFTER THE COMPLETION OF RADIOGRAPHIC EXPOSURE. THE TECHNIQUE IS BOTH SIMPLE AND RELIABLE. FROZEN SECTIONS OF THE LABELED TISSUE ARE CUT ON A PEARSE CRYOSTAT HOUSED IN THE DARK-ROOM AND PICKED UP ON COLD COVER-SLIPS COATED WITH KODAK AR.10 STRIPPING FILM. THE COVER SLIPS ARE STORED, EXPOSED, PROCESSED, AND STAINED IN PERSPEX RACKS TO AVOID BREAKAGE. THE SECTIONS ARE KEPT FROZEN UNTIL COMPLETION OF THE EXPOSURE.

AVAILABILITY - USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D. C. 20545

*ANALYTICAL TECHNIQUE + RADIOGRAPHY + SOLID + RADIONUCLIDE UPTAKE + ANIMAL

040670
GALAND P + MAINGUET P + ARGUELLO M + CHRETIEN J + DOUXFILS N
IN VITRO AUTORADIOGRAPHIC STUDIES OF CELL PROLIFERATION IN THE GASTROINTESTINAL TRACT OF MAN
FREE UNIVERSITY, BRUSSELS
3 PAGES, JOURNAL OF NUCLEAR MEDICINE, VOLUME 9, PAGES 37-9 (JANUARY 1968)

THE S PHASE (PHASE OF DESOXYRIBONUCLEIC ACID SYNTHESIS) AND CELL CYCLE DURATION WAS MEASURED IN HUMAN RECTAL MUCOSAL EPITHELIUM INCUBATED IN VITRO WITH H(3)-THYMIDINE. THE RESULTS OBTAINED ON AUTORADIOGRAMS WAS QUITE REPRODUCIBLE AND SEEMS COMPATIBLE WITH THE AVAILABLE DATA IN THE LITERATURE CONCERNING ESTIMATES MADE AFTER IN VIVO LABELING OF THIS TISSUE. THEREFORE THE PROCEDURE SEEMS TO CONSTITUTE A WAY OF AVOIDING THE BIOLOGICAL HAZARDS OF USING H(3)-THYMIDINE WHEN STUDYING THE PROLIFERATION OF HUMAN TISSUES.

RADIOGRAPHY + DNA + CELL, NUCLEUS + CULTURE + GI TRACT + MITOSIS

040671
KRAUSE MO
TRITIATED THYMIDINE EFFECTS ON DAN, RNA, AND PROTEIN SYNTHETIC RATES IN SYNCHRONIZED L-CELLS
UNIVERSITY OF TORONTO, CANADA
14 PAGES, JOURNAL OF CELLULAR AND COMPARATIVE PHYSIOLOGY, VOLUME 70, PAGES 141-54 (OCTOBER 1967)

EXPONENTIALLY GROWING L CELLS WERE SYNCHRONIZED BY THE DOUBLE THYMIDINE-BLOCK METHOD AND EXPOSED TO HIGH SPECIFIC ACTIVITIES OF TRITIATED THYMIDINE. DNA, RNA, AND PROTEIN SYNTHETIC RATES WERE MEASURED THROUGH ONE CELL CYCLE WITH 1-HOUR PULSES OF THE APPROPRIATE C(14)-LABELED PRECURSORS. EQUIVALENT DOSES OF TRITIATED WATER WERE SUBSTITUTED FOR TRITIATED THYMIDINE IN SOME EXPERIMENTS. TOTAL AMOUNTS OF DNA AND HISTONES PER NUCLEUS WERE DETERMINED PHOTOMETRICALLY IN FEULGEN AND FAST-GREEN STAINED CELLS. IT WAS OBSERVED THAT INCORPORATED TRITIATED THYMIDINE HAS AN EFFECT DISTINCT FROM THAT OF TRITIATED WATER AND THAT IT ENHANCES THE INCORPORATION OF THE PRECURSORS AT SPECIFIC STAGES OF THE CELL CYCLE, TO A DEGREE ROUGHLY PROPORTIONAL TO THE DOSE.

CARBON + SPECIFIC ACTIVITY + DNA + CULTURE + PROTEIN + RNA

040673
WOLFF S + HEDDLE HA
SOME CHROMOSOME STUDIES WITH TRITIATED THYMIDINE
CALIFORNIA UNIVERSITY, SAN FRANCISCO
UCSF-10P2-36 + CONF-670822-2 + . 18 PAGES, FROM INTERNATONAL CONFERENCE ON REPLICATION AND RECOMBINATION OF GENETIC MATERIAL, CANBERRA, AUSTRALIA, SEPTEMBER 1967

IT APPEARS THAT ABERRATIONS AS WELL AS SISTER STRAND EXCHANGES ARE INDEPENDENT OF THE DOSE OF TRITIATED THYMIDINE WITHIN THE RANGE OF DOSES ORDINARILY USED. THIS QUALITATIVE SIMILARITY GIVES ADDED SUPPORT TO THE NOTION THAT THE SISTER STRAND EXCHANGES COULD BE INDUCED BY THE ENDOGENOUS RADIATION RATHER THAN REPRESENT THE GENETIC PHENOMENON OF SPONTANEOUS SISTER STRAND CROSSING OVER. THE NOTION THAT THERE IS A COMPLETE NONRANDOMNESS IN THE DISTRIBUTION OF CHROMATIDS AFTER LABELING WAS NOT CONFIRMED. ON THE CONTRARY, RESULTS INDICATE THAT CHROMATIDS PROCEED TO THE POLES RANDOMLY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

CHROMOSOMAL EFFECT + EFFECT, GENETIC + RADIATION EFFECT, SPECIES

040674
ZAJDELA F
NUCLEAR RADIOLESIONS CAUSED BY THE USE OF RADIOACTIVE PRECURSORS OF NUCLEIC ACID
30 PAGES, PP. 839-68 OF RADIOBIOLOGIE APPLIQUEE, TOME II, PARIS, GAUTHIER-VILLARS, 1966 (IN FRENCH)

DATA ARE GIVEN ON NUCLEAR RADIOLESIONS FOLLOWING THE INCORPORATION OF TRITIUM-LABELED THYMIDINE BY DEOXYRIBONUCLEIC ACID. THE RADIOLESIONS OBSERVED IN ANIMAL AND VEGETABLE ISSURE ARE DESCRIBED AND THE RADIOLESIONS AT THE CELLULAR LEVEL ARE DISCUSSED. THE PRINCIPAL EXPERIMENTAL FACTORS IN THE PRODUCTION OF RADIOLESIONS BY INTRANUCLEAR IRRADIATION ARE SUMMARIZED. THE METHODS FOR DOSIMETRY ARE GIVEN. THE PRACTICAL CONSEQUENCES OF AUTORADIOGRAPHIC EXPERIMENTS ARE CONSIDERED.

DOSIMETRY + RADIOLESION + ANIMAL + ANIMAL, AMPHIBIAN + DNA + CULTURE + LAKE NORMAN

040675
GREENBERG ML + CHANANA AD + CRONKITE EP + SCHIFFER LM + STRYCKMANS PA
TRITIATED THYMIDINE AS A CYTOCIDAL AGENT IN HUMAN LEUKEMIA
BROOKHAVEN NATIONAL LABORATORY + MOUNT SINAI HOSPITAL, N. Y.
9 PAGES, BLOOD, VOLUME 28, PAGES 851-9 (DECEMBER 1966)

TWO PATIENTS WITH ACUTE LEUKEMIA HAD CONSIDERABLE DECREASES IN LEUKEMIC CELLS IN THE PERIPHERAL BLOOD AS WELL AS REDUCTION IN SIZE OF SPLEEN AND LEUKEMIC MASSES AFTER 10 INJECTIONS OF H(3)-TDR GIVEN OVER A 5-DAY PERIOD. EACH INJECTION WAS 1.25 MICROGRAMS/GM BODY WEIGHT. THE PERTINENT ASPECTS OF CYTOTOXIC EFFECTS OF H(3)-TDR ARE REVIEWED. THE RADIATION DOSES DELIVERED TO THE NUCLEUS ARE ESTIMATED FROM AUTORADIOGRAPHIC DATA. EVIDENCE IS PRESENTED FOR THE OBSERVED EFFECTS BEING DUE TO H(3)-TDR.

DOSE CALCULATION, INTERNAL + RADIOGRAPHY + TOXICITY + BLOOD + RADIATION EFFECT + LEUKEMIA

040678
ZHURAVLEV VF + BUGRYSHEV PF + ISTOMINA AG
TOXICITY OF TRITIUM OXIDE IN MICE AND RATS SUBJECTED TO INTRAPERITONEAL INJECTION
6 PAGES, RADIOBIOLOGIYA, VOLUME 6, PAGES 59-64 (1966) (IN RUSSION)

TRITIUM OXIDE AT DOSES OF 2.4 AND 1.2 MC/G INTRAPERITONEAL INJECTIONS CAUSED A CLINICAL PICTURE OF ACUTE RADIATION SICKNESS IN RATS AND MICE WHILE THE INJECTION OF 1.0, 0.8, AND 0.6 MC/G CAUSED ONE OF ONLY MODERATE GRAVITY. THE LD(50/30) WAS 1.03 MC/G FOR RATS AND 0.34 MC/G FOR MICE. RATS RECEIVED THE MAXIMUM DOSE OF TISSUE IRRADIATION TWO WEEKS AFTER THE INTRAPERITONEAL INJECTION OF THE ISOTOPE STAT.

TOXICITY + RADIATION EFFECT, SPECIES + MAMMAL, RAT + EXPOSURE, IP

040679
PHYSICS OF CELLULAR SYNTHESIS, GROWTH, AND DIVISION
PENNSYLVANIA STATE UNIVERSITY
NASA-CR-79921 + N67-11851 +. 21 PAGES, NOVEMBER 7, 1966

SUMMARIES ARE PRESENTED OF THE FOLLOWING RESEARCH - CACL2 DENSITY GRADIENT CENTRIFUGATION OF INTACT BACTERIAL CELLS - HYDROSTATIC PRESSURE EFFECTS ON MACROMOLECULAR SYNTHESIS - CENTRIFUGAL EFFECT ON MACROMOLECULAR SYNTHESIS OF E. COLI - REVISION OF MUTAGENS - HYDROGEN ATOM-AMINO ACID INTERACTION - DOSE SATURATION IN GAMMA-IRRADIATED ORGANIC SOLIDS - RADIATION EFFECTS ON THYMINE AND RELATED PURINE DERIVATIVES - FREE RADICAL PRODUCTION BY DECAY OF TRITIUM IN NUCLEIC ACID PYRIMIDINES - PHOTODYNAMIC ACTION AT THE MOLECULAR LEVEL - BREAKS IN DNA - BACTERIAL GROWTH IN HIGH SUGAR CONCENTRATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

GAMMA EMITTER + BACTERIA + GROWTH/DEVELOPMENT + DNA + AMINO ACID + CELL + MITOSIS + MUTATION + RNA

040680
LEE WR
A QUANTITATIVE STUDY OF THE MUTAGENIC EFFECT OF TRANSMUTATION IN DROSOPHILA AND THE HONEY BEE
LOUISIANA STATE UNIVERSITY, BATON ROUGE
ORO-3728-2 +. 7 PAGES, JUNE 14, 1969

PROGRESS IS REPORTED ON EXPERIMENTS DESIGNED TO DETERMINE THE GENETIC CONSEQUENCES OF CARBON-14 INCORPORATED INTO DNA OF DROSOPHILA MELANOGASTER. PRELIMINARY RESULTS ARE DESCRIBED ON FEEDING LARVAE WITH THYMIDINE LABELED WITH TRITIUM OR CARBON-14. THE RESULTS OF EXPERIMENTS ON ETHYL METHANESULFONATE-INDUCED MOSAICS ARE SUMMARIZED AND THEIR SIGNIFICANCE FOR TRANSMUTATION STUDIES ARE DISCUSSED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

CARBON + INSECT + RADIATION EFFECT + DNA + MUTATION

040681
BREWEN JG + PEACOCK WJ
EFFECT OF TRITIATED THYMIDINE ON SISTER-CHROMATID EXCHANGE IN A RING CHROMOSOME
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
8 PAGES, MUTATION RESEARCH, VOLUME 7, PAGES 433-40 (MAY-JUNE 1969)

PERIPHERAL LYMPHOCYTES FROM A HUMAN MALE HETEROZYGOUS FOR A RING CHROMOSOME WERE CULTURED BOTH IN THE PRESENCE AND ABSENCE OF TRITIATED THYMIDINE. ANALYSIS OF COLCHICINE-ANAPHASE CELLS SHOWED THAT INCORPORATED TRITIATED THYMIDINE INDUCED A SUBSTANTIAL INCREASE IN THE FREQUENCY OF DICENTRIC RING CHROMOSOMES. COMPARABLE LEVELS OF DICENTRICS IN THE FIRST AND SECOND CELL CYCLE FOLLOWING ISOTOPE INCORPORATION INDICATED THAT DICENTRIC INDUCTION IS A DOSE (TRITIUM)-INDEPENDENT PROCESS.

CHROMOSOMAL EFFECT + BLOOD + MAMMAL, PRIMATE + CELL + LYMPHATIC SYSTEM + MITOSIS

040682
PHILLIPS SL
THE CHARACTERIZATION OF REVERTANTS OF TWO LOCI IN E. COLI WWU - A STUDY OF RADIATION ACTION ON THE GENE
PENNSYLVANIA STATE UNIVERSITY
67 PAGES, THESIS, 1968

THE MUTAGENIC PROPERTIES OF TRITIUM DECAY, ULTRAVIOLET LIGHT AND CO(60) GAMMA-RAYS WERE STUDIED USING E. COLI. THESE AGENTS WERE USED TO REVERT TWO LOCI, THE ARGININE LOCUS AND THE THYMIDYLATE SYNTHETASE GENE WHICH BOTH CONTAIN NONSENSE TRIPLETS. REVERTANTS WERE SEPARATED INTO EIGHT CLASSES WHICH CONSISTED OF SEVEN CLASSES OF CELLS WHICH CONTAINED NONSENSE SUPPRESSORS AND ONE CLASS OF STRUCTURAL GENE REVERTANTS. REVERTANTS PRODUCED BY TRITIUM DECAY AND CO(60) RADIATION WERE EXAMINED. THERE APPEARED TO BE NO LARGE MUTAGENIC MOLECULAR REARRANGEMENT AT THE SITE OF THYMIDINE-METHYL-H(3) DECAY. TRITIUM DECAY IN THYMIDINE-METHYL-H(3), URACIL-6 H(3) AND HISTIDINE-H(3) APPEARED TO CAUSE MUTATIONS BY BETA PARTICLE IRRADIATION.

BACTERIA + DNA + AMINO ACID + MUTATION + PROTEIN + ULTRAVIOLET

040683
FUNK FD
LETHALITY AND MUTATIONS PRODUCED BY TRITIUM DECAY IN BACTERIOPHAGES
PENNSYLVANIA STATE UNIVERSITY
81 PAGES, THESIS, 1967

THE VALUES OF THE KILLING EFFICIENCY FROM DECAYS OF H(3)-THYMIDINE OF H(3)-6-HYDROXYMETHYLCYTOSINE IN T4 BACTERIOPHAGE DNA, 0.124, AND DECAYS OF FIVE TRITIATED AMINO ACIDS IN T4 PROTEIN, 0.046, WERE DETERMINED. THE RATIO OF THE KILLING EFFICIENCIES OBTAINED FROM DNA PRECURSOR TO PROTEIN PRECURSOR, 2.7, WAS COMPARED TO A THEORETICAL RATIO, 2.3, WHICH WAS CALCULATED ASSUMING THAT INACTIVATION OCCURS SOLELY BY BETA PARTICLE IONIZATIONS IN THE PHAGE DNA. FROM THIS AGREEMENT IT WAS CONCLUDED THAT NO SIGNIFICANT MOLECULAR REARRANGEMENT OF THE PARENT MOLECULE IMPORTANT IN THE INACTIVATION OF T4 OCCURRED FROM DECAYS OF THESE DNA PRECURSORS, AND THAT THE PRIMARY MEANS OF INACTIVATION WAS BY BETA PARTICLE IONIZATIONS IN THE PHAGE DNA.

BETA EMITTER + LETHAL DOSE + DNA + AMINO ACID + MUTATION + PROTEIN + VIRUS

040775
BRYANT BJ
INCORPORATION OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE
BROOKHAVEN NATIONAL LABORATORY + NAVAL RADIOLOGICAL DEFENSE LABORATORY
BNL-10327 +. 8 PAGES, JOURNAL OF CELL BIOLOGY, VOLUME 29, PAGES 29-36 (APRIL 1966)

TRITIUM FROM METHYL-H(3)-THYMIDINE WAS FOUND TO BE INCORPORATED INTO PROTEINS IN MICE. THIS INCORPORATION IN THE MOUSE AS A WHOLE REPRESENTED BETWEEN 1 AND 10 PERCENT OF THE INJECTED TRITIUM. TRITIATED WATER WAS NOT AN INTERMEDIATE. TRANSMETHYLATION REACTIONS ARE PROPOSED AS A MEANS WHEREBY CERTAIN AMINO ACIDS MIGHT HAVE ACQUIRED THE TRITIUM FROM THYMIDINE AT SOME STAGE OF ITS CATABOLISM. THE INITIAL (2 HR) RATIOS OF DNA TO PROTEIN TRITIUM ACTIVITIES PER/MILLIGRAM OF WET TISSUE RANGED FROM 5 IN TWO TISSUES OF LOW DNA SYNTHETIC ACTIVITY TO 35 TO 40 IN TWO TISSUES OF HIGH DNA SYNTHETIC ACTIVITY . LABELED NUCLEAR PROTEIN WAS COINCIDENT WITH LABELED DNA IN NUCLEI, WHERE IT CONSTITUTED LESS THAN 2.5 PERCENT OF THE TOTAL TRITIUM.

PHYSIOLOGY/METABOLISM + MAMMAL, MOUSE + EXPOSURE, IP + PROTEIN

040776
BOND VP + FEINENDEGEN LE
INTRANUCLEAR 3H THYMIDINE - DOSIMETRIC, RADIOLOGICAL AND RADIATION PROTECTION ASPECTS
BROOKHAVEN NATIONAL LABORATORY
BNL-9435 +. HEALTH PHYSICS, VOL. 12, PAGES 1007-20 (AUGUST 1966)

TRANSMUTATION EFFECTS OF THE DISINTEGRATING H-3 NUCLIDE IN DNA APPEAR TO HAVE BEEN DEMONSTRATED TO PRODUCE GENETIC MUTATIONS IN MICROORGANISMS, AND DATA SUGGESTIVE OF THIS MECHANISM IN DROSOPHILA ARE AVAILABLE. FROM AVAILABLE DATA, IT APPEARS THAT THE DEGREE OF GENETIC EFFECT IN MAMMALIAN CELLS CAN BE APPROXIMATED CLOSELY FROM THE AVERAGE ABSORBED DOSE TO THE NUCLEUS. THE INTRINSIC RBE OF H-3 BETA PARTICLES APPEARS TO BE 1.0 RATHER THAN THE VALUE OF 1.7 CURRENTLY USED FOR RADIATION PROTECTION.

*DOSIMETRY + *DOSE CALCULATION, INTERNAL + *RADIOBIOLOGY + RADIATION SOURCE, INTERNAL + RADIATION EFFECT + MUTATION + RBE

040778
MEWISSEN DJ
INDUCTION OF LEUKEMIA IN THE C57 BL MOUSE BY MEANS OF TRITIATED THYMIDINE
UNIVERSITY, BRUSSELS
3 PAGES, COMPTES RENDUS DES SEANCES DE LA SOCIETE DE BIOLOGIE, VOL. 159, PAGES 1005-7 (1965)(IN FRENCH)

TWO GROUPS OF C57 BL MALE AND FEMALE MICE WERE OBSERVED AFTER THE ANIMALS OF THE FIRST GROUP WERE INJECTED AT BIRTH WITH TRITIATED THYMIDINE AT A DOSE OF 0.3 MICROCURIE PER BODY WEIGHT. THE ANIMALS OF THE CONTROL GROUP RECEIVED A PHYSIOLOGICAL LIQUID. IN THE ANIMALS INJECTED WITH TRITIATED THYMIDINE, 5 DEATHS FOLLOWING THE APPEARANCE OF A LYMPHOID LEUKEMIA AFTER A LATENCY PERIOD FROM 315 TO 524 DAYS WERE OBSERVED. NO LEUKEMIA OR OTHER MALIGNANT TUMOR WAS OBSERVED IN

040778 *CONTINUED*
THE CONTROL GROUP.

MORTALITY + RADIATION SOURCE, INTERNAL + RADIATION EFFECT + MAMMAL, MOUSE + LEUKEMIA + TUMOR

040779
PERSON S + BOCKRATH RC
EVIDENCE FOR A MUTAGENIC LOCAL EFFECT ACCOMPANYING THE DECAY OF INCORPORATED TRITIUM IN ESCHERICHIA COLI
PENNSYLVANIA STATE UNIVERSITY
3 PAGES, JOURNAL OF MOLECULAR BIOLOGY, VOL. 13, PAGES 600-2 (SEPTEMBER 1965)

THE DECAY OF INCORPORATED TRITIUM COMPOUNDS PRODUCES LOSS OF COLONY-FORMING CAPACITY IN BACTERIA. THE LOSS OF COLONY-FORMING CAPACITY SEEMS EXPLICABLE MAINLY ON THE BASIS OF RADIATION DOSE TO THE NUCLEAR REGION OF THE BACTERIUM. THUS THE EXISTENCE OF A LOCAL EFFECT, E.G., A MOLECULAR REARRANGEMENT AT THE SITE OF DECAY, HAS NEVER BEEN SUBSTANTIATED. THE MUTAGENIC EFFICIENCIES OF THE PRECURSORS FOR RNA (H(3)-URIDINE, H(3)-URACIL), DNA, H(3)-THYMIDINE, OR PROTEIN (H(3)-LABELED AMINO ACIDS) HAVE RELATIVE VALUES OF 6.6, 2.4 AND 1.0, RESPECTIVELY.

BACTERIA + RADIATION SOURCE, INTERNAL + RADIATION EFFECT + DNA + AMINO ACID + MUTATION + PROTEIN + RNA

040780
OLIVIERI G + OLIVIERI A
THE MUTAGENIC EFFECT OF TRITIATED URIDINE IN DROSOPHILA SPERMATOCYTES
STATE UNIVERSITY, LEIDEN
4 PAGES, MUTATION RESEARCH, VOL. 2, PAGES 381-4 (AUGUST 1965)

THE MUTAGENIC EFFECTS OF B PARTICLES FROM INCORPORATED H(3)-THYMIDINE OR H(3)-URIDINE IN DROSOPHILA SPERMATOCYTES WERE STUDIED. SINCE ACTINOMYCIN D INHIBITS THE INCORPORATION OF URIDINE, BUT NOT THAT OF THYMIDINE, A COMPARISON OF MUTAGENIC EFFECTIVENESS OF THE TWO TRITIATED NUCLEOSIDES WAS MADE WITH AND WITHOUT ACTINOMYCIN D CO-TREATMENT. H(3)-URIDINE WAS FOUND TO BE A MORE EFFECTIVE MUTAGENIC AGENT THAN H(3)-THYMIDINE, IN SPITE OF THE EFFECT THAT THE SPECIFIC ACTIVITY OF THE THYMIDINE WAS GREATER THAN THAT OF THE URIDINE.

RADIONUCLIDE, INDUCED + RADIATION SOURCE, INTERNAL + SPECIFIC ACTIVITY + INSECT + CELL, NUCLEOLUS + CELL, NUCLEUS + MUTATION + RETENTION

040781
KORANDA JJ
PRELIMINARY STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING GROUND
UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-12302-T +. 13 PAGES, HEALTH PHYSICS, VOL. 11, PAGES 1445-57 (DECEMBER 1965)

THE RESULTS OF A PRELIMINARY SURVEY OF DETONATION ENVIRONMENTS IN THE PACIFIC PROVING GROUNDS INDICATE THAT RESIDUAL TRITIUM AND C14 ARE PRESENT IN RELATIVELY HIGH CONCENTRATIONS IN SOIL MATERIALS OF THE DETONATION SITES AT TIMES UP TO 12 YEARS AFTER THE EVENT. EXCHANGE OF SOIL-BOUND TRITIUM WITH THE AVAILABLE SOIL WATER TAKES PLACE AT A SLOW BUT SIGNIFICANT RATE AND TRITIUM IS DETECTABLE IN PLANTS GROWING IN THE DETONATION ENVIRONMENTS. CARBON-14 IS ALSO ELEVATED IN THE TERRESTRIAL PLANTS. TRITIUM AND C14 ARE ALSO PRESENT IN ELEVATED CONCENTRATIONS IN MARINE ORGANISMS.

*CARBON + *NUCLEAR DETONATION + SOIL + ENVIRONMENT + CONCENTRATION + ANIMAL, AMPHIBIAN

040782
STEIN OL
PROGRESS REPORT ON USE OF TRITIATED THYMIDINE AS INTERNAL SOURCE OF RADIATION IN STUDY OF LATERAL ROOT INITIATION, 1965-1966
MASSACHUSETTS UNIVERSITY, AMHERST
NYO-3561-2 +. 10 PAGES, 1966

CORN AND PEA SEEDLINGS WERE GROWN IN COLD THYMIDINE AT 0.064 AND 64MG/1 (THE LATTER IS 1000 TIMES THE CONCENTRATION AVAILABLE TO THE PLANTS TREATED WITH TRITIATED THYMIDINE). NO EFFECT ON PRIMARY ROOT LENGTH WAS FOUND IN EITHER SPECIES. IN CORN A POSSIBLE DISTURBANCE OF LATERAL ROOT PATTERN WAS NOTICED. REPEAT RUNS WITH BETTER ENVIRONMENTAL CONTROLS WILL PERMIT DEFINITE CONCLUSIONS. IN PEA ROOTS GROWN IN .64 AND 64 PPM THYMIDINE NO PHASING OF THE MITOTIC CYCLE WAS OBSERVED.

*PLANT, SPERMATOPHYTE + RADIATION SOURCE, INTERNAL + CELL + IMMATURE + MITOSIS

040783
BOELUEKBASI EK
THE EFFECT OF TRITIATED THYMIDINE AND GAMMA IRRADIATION ON THE MORTALITY OF THE ADULT DROSOPHILA MELANOGASTER LARVAE (PART II)
CEKMECE NUCLEAR RESEARCH CENTER, ATOMIC ENERGY COMMISSION, ISTANBUL (TURKEY)
CNAEM-32 +. 13 PAGES, NOVEMBER 1965

THE APPLICATION OF TRITIATED THYMIDINE AND CO-60 GAMMA IRRADIATION AT DIFFERENT TIMES TO THE SAME ADULT DROSOPHILA LARVAE CAUSED A HIGH BUT AN ADDITIVE MORTALITY EFFECT. THE APPLICATION OF BOTH

040783 *CONTINUED*
IRRADIATING AGENTS TO THE LARVAE SIMULTANEOUSLY CAUSED A HIGHER MORTALITY RATE WHICH WAS EVEN MORE THAN AN ADDITIVE ONE. SEVERAL FACTORS THAT MIGHT AFFECT THE INCREASE IN MORTALITY RATE OF DROSOPHILA LARVAE WHEN EXPOSED TO RADIATIONS WERE ALSO STUDIED. HOWEVER IT WAS FOUND THAT IRRADIATED TRITIATED THYMIDINE WAS ABOUT THE MOST INFLUENTIAL FACTOR FOR INCREASED MORTALITY IN THE LARVAE.

COBALT + *GAMMA EMITTER + MORTALITY + RADIATION SOURCE, INTERNAL + INSECT + IMMATURE

040784
FEINENDEGEN LE
RADIATION DECOMPOSITION OF TRITIUM-LABELED COMPOUNDS
16 PAGES, PP. 56-71 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

THE PRINCIPAL CHARACTERISTICS OF TRITIUM-LABELED ORGANIC MOLECULES ARE SURVEYED WITH EMPHASIS ON THE STABILITY OF THE LABEL IN BIOLOGICAL SYSTEMS AND ENZYME REACTIONS. AMONG THE LABELED COMPOUNDS DISCUSSED ARE - THYMIDINE, AMINO ACIDS, STEROIDS, AND COMPOUNDS OF EXTREMELY HIGH SPECIFIC ACTIVITY. METHODS FOR THE DETERMINATION OF RADIOCHEMICAL PURITY OF THE SPECIFIC COMPOUNDS AND A DISCUSSION OF THE RADIATION DECOMPOSITION OF TRITIUM-LABELED MOLECULES AND THE STORAGE CONDITIONS THAT SHOULD BE OBSERVED FOR THEM ARE ALSO INCLUDED.

RADIOCHEMICAL ANALYSIS + SPECIFIC ACTIVITY + DECOMPOSITION + AMINO ACID + PROTEIN

040785
FEINENDEGEN LE
TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS
4 PAGES, PP. 338-41 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

TRITIUM-LABELED LEUCINE, PROLINE, AND HISTIDINE WERE LESS TOXIC IN ESCHERICHIA COLI THAN H3-NUCLEOSIDES AND LED TO A KILLING EFFICIENCY OF APPROXIMATELY ONE-HALF THE VALUE OBTAINED FOR H3-URIDINE AND H3-THYMIDINE. STUDIES ON RELATIVE TOXICITY OF H3-CYTIDINE AND H3-THYMIDINE IN HELA CELLS IN CULTURE SHOWED THAT UP TO 0.1 MICROCURIE OF H3-CYTIDINE PER MILLILITER OF MEDIUM HAD NO SIGNIFICANT EFFECT ON VIABILITY, WHILE THE SAME DOSE OF H3-THYMIDINE DEPRESSED SUVIVAL TO 19.8 PERCENT.

BACTERIA + TOXICITY + AMINO ACID + CELL, NUCLEUS + CULTURE + PROTEIN

040786
FEINENDEGEN LE
TOXICITY OF TRITIUM-LABELED THYMIDINE
19 PAGES, PP. 320-38 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

EFFECTS OF TRITIUM-LABELED THYMIDINE ON DNA IN THE NUCLEUS AND GENETIC MATERIAL OF MULTIPLYING CELLS ARE EMPHASIZED. WITHIN THE GROUP OF RADIATION EFFECTS, BESIDES MITOTIC DELAY AND LETHALITY, CHROMOSOME CHANGES AND DELAYED MANIFESTATIONS SUCH AS MUTATIONS AND TUMOR INDUCTIONS ARE OF PREVAILING INTEREST. DATA ARE PRESENTED FOR EFFECTS ON MICROORGANISMS, INSECTS, PLANTS, AND ANIMALS. RELATED INFORMATION CONTRASTING WITH H-3 THYMIDINE TOXICITY OR BEARING ON THE PROBLEM OF GENETIC DAMAGE CAUSED BY OTHER TRITIUM-LABELED AMINO ACIDS IS ALSO CITED

TOXICITY + EFFECT, GENETIC + DNA + CELL, NUCLEUS + MUTATION + PROTEIN

040787
FEINENDEGEN LE
TRANSMUTATION EFFECT
2 PAGES, PP. 341-2 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

WHEN THE CHROMOSOME OF EXCHERICHIA COLI WAS LABELED WITH H-3 THYMIDINE, VIABILITY LOSSES CORRESPONDED TO AN INCREASING NUMBER OF TRITIUM DISINTEGRATIONS, ALTHOUGH ENZYME FORMATION WAS NOT AFFECTED. THE EFFECT OF TRITIUM ON THE REVERSION OF ARGININE DEPENDENCE OF E. COLI WAS INVESTIGATED. TRITIUM BOUND MAINLY TO RNA WAS SIGNIFICANTLY MORE EFFECTIVE IN YIELDING REVERTED MUTANTS AMONG THE SURVIVORS THAN WAS TRITIUM BOUND TO DNA OR PROTEIN. TRANSMUTATION EFFECTS ARE CONSIDERED EXPRESSIONS OF LOCALIZED MOLECULAR REACTIONS INSUFFICIENT FOR CAUSING DEATH BUT CAPABLE OF INDUCING MUTATIONS - THEREFORE THEY SHOULD BECOME RECOGNIZABLE IN CELLS OF HIGHER ORGANISMS WITH PROPER GENETIC TECHNIQUES.

BACTERIA + EFFECT, GENETIC + RADIATION EFFECT + DNA + ENZYME + MUTATION + PROTEIN + RNA

040788
FEINENDEGEN LE
TOXICITY OF TRITIUM-LABELED WATER
4 PAGES, PP. 317-20 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

040788 *CONTINUED*
THE DOSE OF TRITIUM REQUIRED TO PRODUCE TOXIC EFFECTS IN PARAMECIUM WAS VERY LARGE COMPARED WITH THAT FOR MAMMALS. THE PREDOMINANT ROLE OF THE NUCLEUS IN RADIOSENSITIVITY OF MAMMALIAN CELLS WAS SHOWN BY EXPERIMENTS ON RELATIVE TOXICITY OF TRITIUM-LABELED WATER AND THYMIDINE INCORPORATED INTO DNA OF HELA TISSUE CULTURE CELLS.

BACTERIA + RADIOSENSITIVITY + TOXICITY + MORTALITY + MAMMAL + DNA + CELL, NUCLEUS + CULTURE

040789
KAPLAN WD + OFTEDAL P
GENETIC EFFECTS OF TRITIATED THYMIDINE AND EVIDENCE FOR ITS INCORPORATION INTO A CYTOPLASMIC COMPONENT OF THE ADULT TESTIS OF DROSOPHILA MELANOGASTER
CITY OF HOPE MEDICAL CENTER, DUARTE, CALIF. + NORSK HYDRO INSTITUTE FOR CANCER RESEARCH, OSLO
12 PAGES, MUTATION RESEARCH, VOL. 8, PAGES 127-38 (JULY-AUGUST 1969)

SEX-LINKED RECESSIVE LETHALS WERE INDUCED BY THE INJECTION OF H-3 THYMIDINE INTO MALE IMAGOS OF DROSOPHILA MELANOGASTER. ELEVATED MUTATION RATES WERE OBSERVED EARLIER THAN THE TENTH DAY POST-INJECTION WHEN THE FIRST LABELED SPERM CELLS ARE EXPECTED TO BE AVAILABLE FOR FERTILIZATION. RADIOAUTOGRAPHS PREPARED FROM TESTES OF MALES TAKEN FROM SUCCESSIVE BROODS DISCLOSED A CYTOPLASMIC LABEL THAT WAS REMOVABLE BY DNAASE. IT IS SUGGESTED THAT RADIATIONS FROM THE LABELED CYTOPLASMIC DNA WERE RESPONSIBLE FOR THE MUTATIONS PRODUCED IN THE EARLY BROODS. THE NATURE OF THE CYTOPLASMIC BODY WHICH HAD INCORPORATED THE H-3 THYMIDINE IS NOT KNOWN.

DOSIMETRY, PHOTOGRAPHIC + EFFECT, GENETIC + RADIATION SOURCE, INTERNAL + RADIATION EFFECT, SPECIES + INSECT + DNA + TESTIS

040790
BREWEN JG + OLIVIERI G
THE KINETICS OF CHROMATID ABERRATIONS INDUCED IN CHINESE HAMSTER CELLS BY TRITIUM-LABELED THYMIDINE
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-T-1563 +. 14 PAGES, RADIATION RESEARCH, VOL. 28, PAGES 779-92 (AUGUST 1966)

DOSE CURVES WERE OBTAINED FOR THE INDUCTION OF THE VARIOUS TYPES OF CHROMATID ABERRATIONS BY TRITIATED THYMIDINE. WHEN THE YIELDS OF ABERRATIONS WERE PLOTTED AGAINST THE NUMBER OF GRAINS IN THE AUTORADIOGRAMS, TERMINAL DELETIONS AND CHROMATID EXCHANGES EXHIBITED ONE-HIT AND TWO-HIT COMPONENTS IN THEIR DOSE CURVES, AND ISOCHROMATID DELETIONS EXHIBITED LINEAR KINETICS. SINCE THE NUMBERS OF SILVER GRAINS OBTAINED FOR A GIVEN FILM EXPOSURE TIME WERE MEASURES OF RELATIVE DOSE RATES, IT WAS ASSUMED THAT THEY WERE ALSO ON ACCURATE ESTIMATION OF THE TOTAL RELATIVE DOSES.

CHROMOSOMAL EFFECT + EFFECT, GENETIC + RADIATION SOURCE, INTERNAL + EFFECT, SOMATIC + RADIATION EFFECT + CELL, NUCLEUS + CULTURE

040791
SCHEUERMANN W + TAEGDER K
UPTAKE OF TRITATED THYMIDINE IN THE ROOT TIP MERISTEM OF VICIA FABA (L)
TECHNISCHE UNIVERSITY, HANOVER
10 PAGES, RADIATION RESEARCH, VOL. 36, PAGES 483-92 (DECEMBER 1968)

A QUICK AND ACCURATE METHOD FOR DETERMINATION OF TRITIUM-LABELED THYMIDINE IN TISSUE WAS DISCUSSED. AFTER H3-TDR INCORPORATION INTO THE ROOT TIP MERISTEM OF VICIA FABA, TOTAL H3 ACTIVITY AS WELL AS H3-DNA ACTIVITY WAS MEASURED BY LIQUID SCINTILLATION COUNTING. THE INCORPORATION RATE OF H3-TDR USING VARIOUS PARAMETERS WAS EXAMINED - FOR EXAMPLE, THE AMOUNT OF INCORPORATED H3-TDR AS A FUNCTION OF DURATION OF TREATMENT OR AS A FUNCTION OF THYMIDINE CONCENTRATION IN THE NUTRIENT SOLUTION. THE EXPERIMENTAL RESULTS TOGETHER WITH OTHER DATA ALLOWED THE CALCULATION OF THE AVERAGE NUMBER OF INCORPORATED THYMIDINE MOLECULES PER LABELED CELL NUCLEUS.

COUNTER + *ANALYTICAL TECHNIQUE + LIQUID + *RADIONUCLIDE UPTAKE + CONCENTRATION + PLANT + CELL, NUCLEUS

040792
LEBOUTON AV
LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS
UNIVERSITY OF CALIFORNIA, LOS ANGELES
3 PAGES, ANALYTICAL BIOCHEMISTRY, VOL. 26, PAGES 445-7 (DECEMBER 1968)

A METHOD IS DESCRIBED FOR DETERMINING RADIOACTIVITY IN TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS. THE PROTEIN IS FIRST LIBERATED FROM THE GEL BY DISSOLVING THE GEL WITH 30 PERCENT HYDROGEN PEROXIDE. THE FREE PROTEIN IS THEN BROUGHT INTO INTIMATE CONTACT WITH THE SCINTILLATION SOLVENT BY MEANS OF A NEW SOLUBILIZING AGENT. LIQUID SCINTILLATION SPECTROMETRY IS USED TO COUNT THE SAMPLES AND ALL STEPS ARE DONE IN SCINTILLATION VIALS UNDER CONDITIONS CONSIDERED OPTIMAL FOR NO LOSS OF TRITIUM RADIOACTIVITY. THE RESULTS OF DETERMINING RADIOACTIVITY IN INCREASING AMOUNTS OF ALBUMIN-H3 ARE TABULATED. IT WAS FOUND THAT AS THE AMOUNT OF SERUM IS INCREASED THERE IS A CORRESPONDING INCREASE IN THE NET ACTIVITY OF THE SERUM ALBUMIN

ANALYTICAL TECHNIQUE + SPECTROMETRY, BETA + EQUIPMENT DESIGN + LIQUID + PROTEIN

041574
CLEAVER JE
THYMIDINE METABOLISM AND H3 THYMIDINE SUICIDE IN MAMMALIAN CELLS
UNIVERSITY OF CALIFORNIA, SAN FRANCISCO
UCSF-IOP2-33 + CONF-671036-1 +. 21 PAGES, SEPTEMBER 2, 1967, FROM MEETING ON BIOLOGICAL EFFECTS OF TRANSMUTATION AND DECAY OF INCORPORATED ISOTOPES, VIENNA, AUSTRIA

SUICIDE EXPERIMENTS WITH MOUSE LYMPHOMA CELLS DEMONSTRATE THAT THE KILLING EFFICIENCY PER H-3 DECAY DEPENDS ON THE LOCATION OF THE H-3 ATOMS. SURVIVAL CURVES FOR CELL KILLING FROM DECAYS IN ONE DNA STRAND, NUCLEAR RNA, WHOLE CELL RNA, AND WHOLE CELL RNA PLUS PROTEIN ARE ALL EXPONENTIAL WITH NO SHOULDER. THE SURVIVAL CURVE FOR H-3 DECAYS IN BOTH DNA STRANDS IS SIMILAR TO THAT FOR SINGLE STRAND LABEL AT LOW NUMBERS OF DECAYS BUT IS STEEPER ABOVE 400 DECAYS PER CELL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

BETA EMITTER + MAMMAL + DNA + CELL, STEM + RNA

041886
INFLUENCE OF DRUGS ON INTESTINAL CIRCULATION AND THE ABSORPTION OF TRITIUM-LABELED WATER IN THE SMALL INTESTINE OF RATS
UNIVERSITY OF TUEBINGEN, GERMANY
26 PAGES, ARCHIV FUER EXPERIMENTALE PATHOLOGIE UND PHARMAKOLOGIE, NAUNYN-SCHMIEDEBERG/S, VOL. 254, PAGES 199-224 (1966) (IN GERMAN)

IN URETHAN-ANESTHETIZED RATS, TRITIATED WATER (HTO) IN ISOTONIC SALINE WAS INJECTED INTO OR CONTINUOUSLY PERFUSED THROUGH THE LUMEN OF A JEJUNAL LOOP. THE VENOUS OUTFLOW OF THE LOOP, ITS BLOOD CONCENTRATION, AND AMOUNT OF HTO (ABSORPTION RATE) WERE DETERMINED. THE LOSS OF BLOOD WAS SUBSTITUTED BY AN APPROPRIATE INFUSION OF BLOOD. WHEN HTO WAS INJECTED INTO THE JEJUNAL LOOP, THE HTO BLOOD CONCENTRATION AND ABSORPTION RATE DECREASED EXPONENTIALLY. THE DECREASE WAS PROPORTIONAL TO THE BLOOD FLOW. WHEN THE HTO WAS PERFUSED THROUGH THE LUMEN OF A LOOP, THE HTO BLOOD CONCENTRATION AND ABSORPTION RATE WERE CONSTANT IN RELATION TO TIME. WITH INCREASED BLOOD FLOW THE HTO BLOOD CONCENTRATION DECREASED AND THE HTO ABSORPTION RATE INCREASED.

*ABSORPTION + ACCUMULATION + BLOOD + *MAMMAL, SMALL + BLOOD, SERUM + BLOOD, VASCULAR SYSTEM + *INTESTINE, SMALL

041887
BAKER NF + BLACK AL + ANAND RS + FISK RA
BODY WATER TURNOVER IN CATTLE WITH PARASITIC GASTROENTERITIS
UNIVERSITY OF CALIFORNIA, DAVIS
6 PAGES, EXPERIMENTAL PARISITOLOGY, VOL. 27, PAGES 271-6 (DECEMBER 1965)

CATTLE WERE INJECTED WITH H(3)2O TO STUDY TOTAL-BODY WATER TURNOVER AND VOLUME IN NORMAL AND SEVERELY PARASITIZED ANIMALS. THE PARASITIZED CATTLE WERE HEREFORD FEEDERS WHICH HAD ACQUIRED INFECTIONS WITH OSTERTAGIA OSTERTAGI, TRICHOSTRONGYLUS AXEI, AND COOPERIA SPP WHILE ON PERMANENT PASTURE. DURING THE H(3)2O TURNOVER STUDIES ALL ANIMALS HAD FREE ACCESS TO FEED AND WATER. THE MEAN TOTAL-BODY WATER VOLUME IN PARASITIZED ANIMALS WAS 78 PERCENT OF THE BODY WEIGHT. THIS REPRESENTS AN INCREASE OF 8 TO 15 PERCENT OVER THAT FOUND IN NORMAL ANIMALS OF SIMILAR AGE. THE MEAN TURNOVER RATE OF BODY WATER IN NORMAL ANIMALS WAS 0.223, WHILE THAT OF PARASITIZED CATTLE WAS 0.110.

*WATER, DRINKING + *PARASITISM + *MAMMAL, LARGE

041888
MAKSYMOWYCH R + DEVLIN RG + BLUM MK + HOCHOX ZS
3H THYMIDINE CORPORATION INTO NUCLEAR DNA OF LEAF CELLS
VILLANOVA UNIVERSITY, PA.
5 PAGES, PLANT PHYSIOLOGY, VOL. 42, PAGES 814-18 (JUNE 1967)

THE INCORPORATION OF H(3)-THYMIDINE INTO NUCLEAR DNA OF LEAF CELLS OF ZANTHIUM PENNSYLVANICUM WAS STUDIED AS A FUNCTION OF CONCENTRATION AND SPECIFIC ACTIVITY OF THE RADIOISOTOPE. FROM THE ASSESSMENT OF THE AVERAGE NUMBER OF GRAINS PER NUCLEUS AND THE PERCENT OF LABELED NUCLEI, IT WAS CONCLUDED THAT THE INCORPORATION WAS A LINEAR FUNCTION OF CONCENTRATION OF THE EXOGENOUS RADIOISOTOPIC SOLUTION AND A LOGARITHMIC FUNCTION OF THE INCUBATION TIME.

ADSORPTION + *ACCUMULATION + PLANT, SPERMATOPHYTE + *DNA + *CELL, NUCLEUS

041889
KOCH AL
ON THE DIFFERENCE BETWEEN THE LETHAL EFFECTS OF H3 AND P32 IN BACTERIA
UNIVERSITY OF FLORIDA, GAINESVILLE
15 PAGES, RADIATION RESEARCH, VOL. 29, PAGES 18-32 (SEPTEMBER 1966)

THE LETHAL EFFECTS OF INCORPORATED RADIOISOTOPES INTO BACTERIAL POPULATIONS LABELED DURING LOGARITHMIC GROWTH ARE ANALYZED. A MODEL IS PRESENTED. IT IS SHOWN THAT THE DNA PER CELL IS DISTRIBUTED ACCORDING TO THE SAME INVERSE-SQUARE DISTRIBUTION LAW THAT APPLIES TO CELL SIZE. THE ANALYSIS TAKES INTO ACCOUNT THE FACT THAT NUCLEAR BODY SEPARATION IS MIDWAY BETWEEN CELL DIVISIONS. A HIT ANY PLACE IN THE GENOME INACTIVATES THAT GENOME. THE CALCULATED CURVES HAVE LOWER EXTRAPOLATION NUMBERS THAN THE POPULATION AVERAGE NUMBER OF NUCLEAR BODIES. THIS MODEL

041889 *CONTINUED*

ADEQUATELY ACCOUNTS FOR RESULTS WITH H-3. A HIT IN ONLY ONE OF THE PARTIALLY REPLICATED REGIONS OF A CHROMOSOME DOES NOT RENDER INVIABLE THE GENOME RESULTING FROM THE FURTHER REPLICATION AND SEPARATION OF THE OTHER DOUBLE STRAND - MARKEDLY HIGHER EXTRAPOLATION NUMBERS ARE CALCULATED. THIS MODEL ACCOUNTS FOR THE MULTIHIT KINETICS OBSERVED FOR P-32 SUICIDE, AND THIS IS COMPATIBLE WITH THE REPORTED EXTRAPOLATION NUMBERS WHICH ARE LARGER THAN OUR CYTOLOGICAL OBSERVATION OF THE AVERAGE NUMBER OF NUCLEI PER CELL.

*PHOSPHORUS + *BACTERIA + MODEL + *LETHAL DOSE + DNA + MITOSIS

041890
CROWN CW + GREENHAM LW + HILL TJ + MEEK ES + PEACOCK OB
RADIOAUTOGRAPHIC PROCESSING SEQUENCE FOR COVERSLIP MONOLAYER TISSUE CULTURES LABELED WITH TRITIATED THYMYDINE
MEDICAL SCHOOL, BRISTOL, ENGLAND
11 PAGES, LABORATORY PRACTICE, VOL. 16, PAGES 49-59 (JANUARY 1967)

STUDIES ARE IN PROGRESS ON THE NUCLEAR DAMAGE TO CELLS FOLLOWING IRRADIATION WITH ULTRAVIOLET LIGHT OF 2537-A WAVELENGTH. THE DAMAGE IS IN PART MEASURED BY THE ABILITY OF THE IRRADIATED CELLS TO INCORPORATE TRITIATED THYMIDINE INTO THE NUCLEI, AND IN PART BY THE INTENSITY OF THE SUPERIMPOSED FEULGEN STAINING REACTION. COVERSLIP MONOLAYER CULTURES OF THE CELLS PROVED TO BE EMINENTLY SUITABLE FOR THESE STUDIES BECAUSE NUMBERS OF REPLICATE CULTURES WERE EASILY AND QUICKLY PROCESSED AT ANY ONE TIME, AND BECAUSE PERMENENT PREPARATIONS WERE READILY MADE OF THE FINISHED RADIOAUTOGRAMS FOR MICROSCOPIC AND REFERENCE PURPOSES.

ANALYTICAL TECHNIQUE + *RADIOGRAPHY + DNA + CELL, NUCLEUS + *CULTURE

041891
MCGREGOR DD
8 PAGES, IMMUNOLOGY, VOL. 16, PAGES 83-90 (JANUARY 1969)
TRUDEAU RESEARCH INST., SARANAC LAKE, N.Y.
8 PAGES, IMMUNOLOGY, VOL. 16, PAGES 83-90 (JANUARY 1969)

RESULTS OF EXPERIMENTS IN X-IRRADIATED RECIPIENT RATS SUGGESTED THAT DIVIDING CELLS IN BONE MARROW CAN GENERATE LYMPHOCYTES CAPABLE OF INITIATING A SYSTEMATIC GRAFT-VS-HOST REACTION. CONCENTRATIONS OF H(3)-THYMIDINE AND BUDR THAT INHIBITED THE DEVELOPMENT OF PUTATIVE LYMPHOCYTE PRECURSORS IN BONE MARROW HAD NO OBVIOUS EFFECT ON THE IMMUNOLOGOCAL PERFORMANCE OF THORACIC DUCT LYMPHOCYTES. THE RESULTS STRENGTHEN THE VIEW THAT H(3)-THYMIDINE AND BUDR EXERT THEIR INHIBITORY EFFECT ON REPLICATING LYMPHOCYTE PRECURSERS AND NOT ON LONG-LIVED MEMBERS OF THE CIRCULATING LYMPHOCYTE POOL.

GROWTH/DEVELOPMENT + BONE, MARROW + IMMUNOLOGY + LYMPHATIC SYSTEM

041892
KING V
A STUDY OF THE MECHANISM OF WATER ACROSS FROG SKIN BY A COMPARISON OF THE PERMEABILITY OF THE SKIN TO DEUTERATED AND TRITIATED WATER
CHELSEA COLLEGE, LONDON
10 PAGES, JOURNAL OF PHYSIOLOGY (LONDON), VOL. 200, PAGES 529-38 (FEBRUARY 1969)

THE POSSIBILITY OF EXISTENCE OF AN ISOTOPE EFFECT WAS EVALUATED IN A STUDY OF THE MOVEMENT OF D2O AND T2O IN THE FROG. THE RATE OF EQUILIBRATION OF DEUTERATED AND TRITIATED WATER ACROSS THE SKIN WAS FOLLOWED AT PH 5.0, 6.9, AND 8.0 WITH RINGER SOLUTION BATHING BOTH SURFACES OF THE SKIN - AND AT PH 7.0 WITH SULPHATE-RINGER SOLUTION BATHING BOTH SURFACES OF THE SKIN. THE RATIO OF THE PERMEABILITY COEFFICIENTS FOR THE INFLUX OF DEUTERATED AND TRITIATED WATER HAD A MEAN VALUE OVER ALL THE EXPERIMENTS OF 0.9954 +-0.0207, INDICATING THAT NO ISOTOPE EFFECT WAS OBSERVABLE WITHIN THE LIMITS OF ACCURACY OF THE METHOD USED.

*DEUTERIUM + *WATER + COMPARISON + *TRANSPORT + SKIN

041893
BERENDES HD + BOYD JB
STRUCTURAL AND FUNCTIONAL PROPERTIES OF POLYTENE NUCLEI ISOLATED FROM SALIVARY GLANDS OF DROSOPHILA HYDEI
MAX-PLANCK-INSTITUT FUER BIOLOGIE, TUEBINGEN, GERMANY
9 PAGES, JOURNAL OF CELLULAR BIOLOGY, VOL. 41, PAGES 591-9 (MAY 1969)

SALIVARY GLAND NUCLEI OF DROSOPHILA HYDEI, ISOLATED BY A MODIFICATION OF THE PROCEDURE DESCRIBED BY BOYD ET AL, RETAIN THEIR NORMAL MORPHOLOGY DURING THE ISOLATION AND SUBSEQUENT INCUBATION PROCEDURE. RNA SYNTHESIS WAS STUDIED IN ISOLATED NUCLEI BY BIOCHEMICAL AND CYTOLOGICAL TECHNIQUES. IN RADIOAUTOGRAPHS 70 PERCENT OF THE NUCLEI DISPLAYED A DISTRIBUTION OF LABELED RNA OVER THE NUCLEAR CONSTITUENTS SIMILAR TO THE DISTRIBUTION OBTAINED AFTER IN VIVO INCORPORATION OF RADIOACTIVE PRECURSOR. CHROMOSOME PUFFS AND THE NUCLEOLI WERE SPECIFICALLY LABELED. THE REMAINING 30 PERCENT OF THE NUCLEI SHOWED A WEAK TO VERY WEAK INCORPORATION OF RADIOACTIVE PRECURSOR.

RADIOGRAPHY + CHROMOSOMAL EFFECT + DNA + *CELL, NUCLEUS

041894
REID BL
THE FATE OF ISOTOPE-LABELLED UTERINE SPERMATOZOA IN THE MOUSE POSTCOITUM
UNIVERSITY OF SYDNEY, AUSTRALIA
7 PAGES, AUSTRALIAN JOURNAL OF ZOOLOGY, VOL. 13, PAGES 525-31 (OCTOBER 1965)

TECHNICS ARE DESCRIBED FOR PRODUCING ISOTOPICALLY LABELED SPERM IN TWO WAYS. BOTH TYPES OF ISOTOPICALLY LABELED SPERM WERE USED TO INVESTIGATE THE FATE OF THE UTERINE SPERM RESIDUE. A PORTION OF THE SPERM PRESENT IN THE UTERUS EXHIBITING A COPULATION PLUG WAS REMOVED AND REPLACED BY INTRAUTERINE INJECTION OF LABELED SPERM. SEVENTEEN HOURS AFTER INJECTION, LABEL WAS PRESENT IN SPERM IN THE LUMEN, IN DEBRIS ASSOCIATED WITH POLYMORPHONUCLEAR GRANULOCYTES AND MONOCYTES IN THE LUMEN, IN THE EPITHELIAL AND SUBEPITHELIAL COATS OF THE MUCOSA, AND IN PHAGOCYTIC CELLS OF THE LOWER ABDOMINAL LYMPH NODES AND SPLEEN

TRANSFER FUNCTION + DISTRIBUTION + MAMMAL, SMALL + TESTIS + UTERUS

041895
MAZRIMAS JA + HATCH FT + BISHOP CC + GILL JE
RADIATION EFFECTS POLY-DAT FROM INTRAMOLECULAR TRITIUM
CALIFORNIA UNIVERSITY, LAWRENCE RADIATION LABORATORY
UCRL-50559 +. 30 PAGES, DECEMBER 6, 1968

POLY-DAT WAS BIOSYNTHESIZED. AQUEOUS SOLUTIONS WERE STORED AT -20 C AND THAWED AT INTERVALS FOR COMPARISON OF TEMPLATE ACTIVITY, ULTRAVIOLET ABSORBANCE AND THERMAL TRANSITION WITH THAT OF UNLABELED POL-DAT. THE H-3 CONTENT OF THE TWO SAMPLES WAS 1.5 X 10(8TH) AND 4.4 X 10(8TH) DPM/MG. RADIATION DOSES WERE ESTIMATED TO BE 2.9 AND 8.6 RAD/DAY (300 AND 1000 RAD OVER 3 MONTHS), RESPECTIVELY, ASSUMING UNIFORM DISTRIBUTION OF ABSORBED ENERGY IN THE SOLUTION. THE NORMALLY EXCELLENT TEMPLATE ACTIVITY OF POLY-DAT FOR RNA AND DNA POLYMERASES FROM COLI PROGRESSIVELY DECREASED. THE IMPAIRMENT BECAME MEASURABLE AFTER A DOSE OF ONLY 20-50 RAD.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*BACTERIA + *RADIATION EFFECT + DNA + RNA

041899
MARIN G +
LETHALITY FROM 3H-NUCLEOSIDES INCORPORATED IN MAMMALIAN CELLS
INTERNATIONAL LAB. OF GENETICS AND BIOPHYSICS, NAPLES (ITALY)
EUR-3290F-3 +. 5 PAGES, PP. 73-7, MAY 18, 1966

PRELIMINARY RESULTS ARE REPORTED FOR A SERIES OF EXPERIMENTS DESIGNED TO DETERMINE THE EFFECTIVENESS OF TRITIUM-LABELED THYMIDINE INCORPORATION AS OPPOSED TO TRITIUM-LABELED URIDINE INCORPORATION IN CAUSING CELL DEATH, AND THE EFFECTS OF TIME OF INCUBATION AT 20 C ON THE SURVIVAL OF CELLS EXPOSED TO CONSTANT DOSES OF TRITIUM-LABELED THYMIDINE OR TRITIUM-LABELED URIDINE. IT WAS SHOWN THAT THYMIDINE-INCORPORATED TRITIUM WAS MORE EFFECTIVE THAN URIDINE-INCORPORATED TRITIUM IN CAUSING THE DEATH OF CULTURED HAMSTER FIBROBLAST CELLS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*MORTALITY + *MAMMAL + DNA + AMINO ACID + *CELL + RNA

041900
OCKEY CH
CHROMATID ABERATIONS RESULTING FROM 3H-THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS
CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE, MANCHESTER, ENG.
6 PAGES, INTERNATIONAL JOURNAL OF RADIATION BIOLOGY, VOL. 13, PAGES 479-84 (1967)

CHROMATID ABERRATIONS WERE INDUCED BY H(3)-THYMIDINE INCORPORATED IN EARLY AND LATE S PERIODS OF HUMAN XY, XXY, AND XX CELLS. AT SIMILAR TOTAL H-3 DISINTEGRATIONS, LATE S CELLS WERE FOUR TIMES (XY) OR SEVEN TIMES (XXY) MORE SENSITIVE THAN EARLY S CELLS. THIS DIFFERENCE IS PARTLY ATTRIBUTABLE TO DOSE-RATE DIFFERENCES BETWEEN SAMPLES. LOCALIZATION PRODUCES AN INTRANUCLEAR DOSE-RATE EFFECT DEMONSTRATED BY THE CONCENTRATION OF ABERRATIONS TO LATE-LABELLING CHROMOSOMES, PARTICULARLY THE LATE X. ANY ATTEMPT AT COMPARING STAGE SENSITIVITY MUST BE CARRIED OUT AT AN INTRACHROMOSOMAL LEVEL.

*CHROMOSOMAL EFFECT + RADIATION EFFECT + CELL, STEM + MAN

041901
MCCARTHY C + NESTER EW
INACTIVATION OF TRANSFORMING DNA BY TRITIUM DISINTEGRATIONS IN VIVO
UNIVERSITY OF WASHINGTON, SEATTLE
2 PAGES, BIOCHIMICA ET BIOPHYSICA ACTA, VOL. 166, PAGES 249-50 (AUGUST 23, 1968)

TO DETERMINE WHETHER THE RADIATION RESULTING FROM TRITIUM IN PROTEIN DAMAGES DNA AND WHETHER AMINO ACID-INCORPORATED TRITIUM KILLS LESS EFFICIENTLY THAN THYMIDINE-INCORPORATED TRITIUM BY DIRECT ASSAY OF THE BIOLOGICAL ACTIVITY OF TRANSFORMING DNA ISOLATED FROM BACILLUS SUBTILIS THAT HAD INCORPORATED TRITIUM-LABELED THYMIDINE OR AMINO ACIDS. IT WAS CONCLUDED THAT THE BASIC CAUSE OF

041901 *CONTINUED*
DEATH WAS INDEPENDENT OF THE MACROMOLECULE THAT CONTAINED THE TRITIUM AND THAT DEATH FROM TRITIUM RESULTED IN ACTIVATION OF THE GENOME BY IONIZING RADIATION.

*BACTERIA + RADIATION EFFECT + *DNA + AMINO ACID + CELL + PROTEIN

042765
BERGER EY + PECKIKYAN FR + KANZAKI G
ANESTHETIC GASES AND WATER STRUCTURE. THE EFFECT OF XENON ON TRITIATED WATER FLUX ACROSS THE GUT
NEW YORK UNIVERSITY, NEW YORK
11 PAGES, JOURNAL OF GENERAL PHYSIOLOGY, VOL. 52, PAGES 876-86 (DECEMBER 1968)

THE FLOW OF T2O ACROSS THE MUCOSAL SURFACE OF RAT CECUM AS AFFECTED BY XE, AS AN ANESTHETIC GAS, WAS STUDIED. TO EVALUATE THE EFFECT OF EXPOSURE TO XE ON TRITIATED WATER FLUX, EACH CECUM SERVED AS ITS OWN CONTROL. WHEN XE COMPRISED 50 PERCENT OF THE TOTAL GAS FLOW, TRITIATED WATER FLUX ACROSS THE CECUM SLOWED BY 7.8 +- 2.2 PERCENT (MEAN +- STANDARD ERROR). WHEN XE COMPRISED 80 PERCENT OF TOTAL GAS FLOW, WATER FLUX SLOWED BY 12.9 +- 3.3 PERCENT. THESE FINDINGS ARE CONSISTENT WITH THE THEORY THAT THE PRESENCE OF AN ANESTHETIC GAS IN TISSUE INDUCES A CAGE-LIKE ARRANGEMENT OF HYDROGEN-BONDED WATER MOLECULES.

*WATER + *XENON + *RADIATION EFFECT + MOLECULAR EFFECT + MAMMAL, SMALL + CECUM

042766
ZHURAVLEV VF + LYAGINSKAYA AM
EFFECT OF TRITIUM OXIDE ON THE FERTILITY OF MALES
AEC-TR-6944 +. 10 PAGES, PAGES 503-13, TRANSLATED FROM PP. 399-407 OF RASPREDELENIE I BIOLOGICHESKOE DEISTVIE RADIOAKTIVNYKH IZOTOPOV, ATOMIZDAT, MOSCOW, 1966

THE ADMINISTRATION OF TRITIUM OXIDE IN THE DOSES OF 0.3 AND 0.08 MICROCURIE/G TO RATS PRODUCED A STERILIZING EFFECT ON MALES. THIS EFFECT DEPENDS ON THE DOSE SIZE AND IS EXPRESSED IN (A) DECREASE IN THE MATING ABILITY OF THE MALES, (B) DECREASE IN THE NUMBERS OF OFFSPRING IN LITTERS PRODUCED BY MATING THE MALES WITH INTACT FEMALES, (C) FREQUENT DEATHS OF FETUSES AND A HIGH PROPORTION OF STILLBIRTHS, (D) CHANGE IN THE WEIGHT OF TESTES. TRITIUM OXIDE ADMINISTERED TO RATS IN THE DOSE OF 0.08 MICROCURIE/G DID NOT PRODUCE MARKED CHANGES IN THE BLOOD SYSTEM. THE ADMINISTRATION OF TRITIUM OXIDE IN THE DOSE OF 0.3 MICROCURIE/G PRODUCED MARKED CHANGES IN THE BLOOD SYSTEM AS EXPRESSED IN THE DECREASE IN ERYTHROCYTE AND LYMPHOCYTE COUNTS AND SHARP FLUCTUATIONS IN THE NEUTROPHIL COUNT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

DOSE + *OXIDE + *EFFECT, GENETIC + BLOOD + *RADIATION EFFECT + MAMMAL, SMALL + FETUS + NEWBORN + TESTIS

042767
FERRON F + VAN ASSCHE J + BEROCHE M + COSTES C
STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. II. CRITICAL STUDY OF TECHNIQUES FOR ANALYSIS AND MEASUREMENT OF RADIOACTIVITY OF WATER AND TRITIATED LEAF METABOLITES.
CENTRE NATIONAL DE RECHERCHES AGRONOMIQUES, FRANCE
33 PAGES, ANNALES DE PHYSIOLOGIE VEGETALE, VOL. 7, PP. 171-203 (1965)(IN FRENCH)

DESCRIBES EXPERIMENTAL TECHNIQUES NECESSARY FOR THE STUDY OF WATER METABOLISM IN WHEAT LEAVES WITH TRITIATED WATER. TWO MAJOR PROBLEMS OCCUR WITH THIS ISOTOPE - DETERMINATION OF RADIOACTIVITY IN VARIOUS TRITIATED COMPOUNDS BY LIQUID SCINTILLATION, AND ISOTOPIC EFFECTS, MAINLY ISOTOPIC EXCHANGE. LIQUID SCINTILLATION TECHNIQUES FOR COUNTING RADIOACTIVITY OF 3H ARE COMPARED FOR VARIOUS SCINTILLATORS - THEIR CHARACTERISTICS ARE SUMMARIZED IN A TABLE.

COUNTER + *WATER + *ANALYTICAL TECHNIQUE + *PHYSIOLOGY/METABOLISM + TURNOVER RATE + BIOLOGICAL CONTROL

042769
COSTES C + FERRON F + ASSCHE J + DEROCHE M
STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY
CENTRE NATIONAL DE RECHERCHES AGRONOMIQUES, FRANCE
13 PAGES, ANNALES DE PHYSIOLOGIE VEGETALE, VOL. 6, PG 303-15 (1964)(IN FRENCH)

REVIEWS THE USE OF H-3 AND O(18)-LABELED WATER FOR STUDY OF PLANT METABOLISM. IN ADDITION TO A SURVEY OF EXPERIMENTAL RESULTS, TECHNIQUES FOR COUNTING TRITIUM IN BIOLOGICAL SYSTEMS ARE DESCRIBED, INCLUDING USE OF GAS COUNTERS AND SCINTILLATION COUNTERS, CHARACTERISTICS OF VARIOUS SCINTILLATORS, MEASUREMENT PROCEDURES FOR H-3, SIMULTANEOUS COUNTING OF H-3 AND C-14, AND THE EFFECT OF EXTINCTION.

BIBLIOGRAPHY + COUNTER + MEASUREMENT + *WATER + REVIEW + RESPIRATION + *PHYSIOLOGY/METABOLISM + VEGETATION + CONCENTRATION + TRANSPORT

042770
PLAMONDON JE + BASSHAM JA
GLYCOLIC ACID LABELING DURING PHOTOSYNTHESIS WITH C(14)O2 AND TRITIATED WATER

042770 *CONTINUED*
UNIVERSITY OF CALIFORNIA, BERKELEY
UCRL-16919 +. 4 PAGES, PLANT PHYSIOLOGY, VOL. 14, PP. 1272-5 (OCTOBER 1966)

EARLIER ATTEMPTS TO PERFORM PHOTOSYNTHESIS EXPERIMENTS IN THE PRESENCE OF HTO AND 14(CO)2 GAVE UNCERTAIN AND VARIABLE RESULTS. THE PRINCIPAL PROBLEM WAS IN OBTAINING ACCURATE COUNTING RESULTS FOR BOTH TRITIUM AND C14. TO OBTAIN RELIABLE COUNTING RESULTS IT WAS NECESSARY TO RAISE THE RATIO OF TRITIUM TO C-14 IN THE INCUBATION MIXTURE TO A HIGH LEVEL. IT IS INCLUDED THAT FORMATION OF LABELED GLYCOLIC ACID AS A CONSEQUENCE OF ITS PROPOSED HYDROGEN TRANSPORT ROLE IN PHOTOSYNTHESIS IS QUANTITATIVELY OF LIMITED IMPORTANCE COMPARED TO THE NET SYNTHESIS OF GLYCOLIC ACID FROM CO2.

*COUNTER + OXYGEN + *WATER + TROPHIC LEVEL + RADIONUCLIDE UPTAKE + CONCENTRATION + PLANT, ALGAE/FUNGI + TRANSPORT + *ACID

042852
MCMANUS WR + PRICHARD RK + RAKER C + PETRUCHENIA MV
ESTIMATION OF WATER CONTENT BY TRITIUM DILUTION OF ANIMALS SUBJECTED TO RAPID LIVE-WEIGHT CHANGES
UNIVERSITY OF NEW SOUTH WALES, AUSTRALIA
9 PAGES, JOURNAL OF AGRICULTURAL SCIENCE, VOL. 72, PG 31-40 (JANUARY 1969)

REPORTS VARIOUS PROBLEMS IN THE USE OF TRITIATED WATER (TOH) TO ESTIMATE TOTAL BODY WATER (TBW) OF ANIMALS EXPERIENCING RECOVERY FROM MALNUTRITION.

*WATER + EFFECT, GENETIC + BLOOD + *RADIATION EFFECT + MAMMAL, SMALL + CARCINOGEN + LIVER

043086
HODGES TK + VAADIA Y
UPTAKE AND TRANSPORT OF RADIOCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS
UNIVERSITY OF CALIFORNIA, DAVIS
5 PAGES, PLANT PHYSIOLOGY, VOL. 39, PG 104-108 (JANUARY 1964)

THE UPTAKE AND TRANSPORT OF RADIOCHLORIDE AND TRITIATED WATER BY DIFFERENT ROOT ZONES OF INDIVIDUAL EXUDING ONION (ALLIUM CEPA) ROOTS OF DIFFERENT CHLORIDE STATUS WAS DETERMINED. THE TERMINAL 3 CM OF THE ROOT WAS MOST ACTIVE IN CL(36) ACCUMULATION AND TRANSPORT TO THE EXUDATE. THE NET RATE OF CL(36) ACCUMULATION BY THE ROOT TISSUE INITIALLY DECREASED WITH TIME, WHEREAS THE RATE OF CL(36) TRANSPORT TO THE EXUDATE REMAINED CONSTANT OVER A 12 HOUR PERIOD. IT WAS SUGGESTED THAT THE TRANSPORT OF IONS INTO VACUOLES ALSO OCCURS AT A CONSTANT RATE WHICH IS ACCOMPANIED BY PROGRESSIVELY INCREASING RATES OF ION EFFLUX FROM VACUOLES.

HEAVY WATER + *TRANSPORT THEORY + RADIOISOTOPE + CHLORIDE + *RADIONUCLIDE UPTAKE + ACCUMULATION + CONCENTRATION + PLANT, ALGAE/FUNGI

043088
SKAUEN DM
THE EFFECTS OF TRITIUM OXIDE ON AQUATIC ORGANISMS
UNIVERSITY OF CONNECTICUT
TID-18499 +. 11 PAGES, APRIL 5, 1963

A LARGE COLONY OF GUPPIES WAS RAISED UNDER RIGIDLY CONTROLLED CONDITIONS. RECORDS WERE KEPT ON THE VITAL STATISTICS OF EACH BROOD REARED. A WEALTH OF INFORMATION ABOUT GUPPIES WAS OBTAINED WHICH WILL SERVE AS COMPARATIVE DATA FOR FUTURE STUDIES ON FISH RAISED IN A T2O ENVIRONMENT. RESULTS OF A PILOT STUDY USING 5 GUPPIES SHOWED THAT NONE OF THE TISSUE SAMPLES CONTAINED T2O. THIS MAY INDICATE LACK OF EXCHANGE OF T FOR H OR LACK OF ASSIMILATION OR TISSUE BINDING.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*CONTROL + *MONITOR, BACKGROUND + *ENVIRONMENT + EXPERIMENT + DATA COLLECTION + *CONCENTRATION + AQUATIC ORGANISM

043092
JARVIS P + HOUSE CR
RADIAL EXCHANGE OF LABELED WATER IN MAIZE ROOTS
UNIVERSITY OF EAST ANGLIA, NORWICH, ENGLAND
12 PAGES, JOURNAL OF EXPERIMENTAL BIOLOGY, VOL. 19, PG 695-706 (NOVEMBER 1967)

THE EFFLUX KINETICS OF H(3)2O WAS STUDIED IN ISOLATED MAIZE ROOTS TO IDENTIFY THE RATE-LIMITING STEP IN THIS RADIAL EXCHANGE PROCESS. ALTHOUGH THE EFFLUX CURVE OF H(3)2O COULD BE MATHEMATICALLY DESCRIBED BY THE SOLUTION FOR AN APPROPRIATE CYLINDRICAL DIFFUSION PROBLEM, OTHER EXPERIMENTAL EVIDENCE WAS INCOMPATIBLE WITH THIS MODEL. IT WAS CONSIDERED THAT THE EFFLUX KINETICS OF H(3)-LABELED WATER RESULTED FROM THE CHARACTERISTICS OF MEMBRANE PENETRATION IN A HETEROGENEOUS MULTICELLULAR PREPARATION LIKE THE ROOT.

DIFFUSION + HEAVY WATER + *AGRICULTURE + CHEMICAL KINETICS + MATHEMATICAL TREATMENT + MODEL TESTING + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + PLANT, SPERMATOPHYTE + PLANT, ALGAE/FUNGI + *RADIATION EFFECT

043093
PELC SR + WELTON MGE
QUANTITATIVE EVALUATION OF TRITIUM IN AUTORADIOGRAPHY AND RADIOCHEMISTRY
MEDICAL RESEARCH COUNCIL, LONDON
3 PAGES, NATURE (LONDON), VOL. 216, VOL. 216, PG 925-7 (DECEMBER 2, 1967)

CALCULATIONS ARE PRESENED OF THE BETA-PARTICLE ABSORPTION WITHIN A LAYER INCORPORATING TRITIUM, AND IN A SUPERIMPOSED LAYER OF ORGANIC MATERIAL. FOR A BIOLOGICAL SPECIMEN THE ABSORPTION CAN BE TAKEN AS PROPORTIONAL TO DENSITY. THE EMISSION SPECTRUM OF TRITIUM WAS COMPUTED USING A NUCLEAR COULOMB FACTOR EVALUATED FROM NBS TABLES, AND THE AVERAGE KINETIC ENERGY WAS CALCULATED AS 5.7 KEV, WITH A PEAK AT 2.3 KEV. THE PERCENTAGE OF PARTICLES TRAVERSING A GIVEN THICKNESS OF MATERIAL, AND THEIR EMERGENT ENERGIES, WERE ESTIMATED, AND A SERIES OF CALCULATIONS MADE FOR AN EVENLY LOADED LAYER COVERED BY AN UNLABELED LAYER. THE COMPUTED RESULTS FOR THE PERCENTAGE OF EMERGING BETA-PARTICLES AGREED WELL WITH EXPERIMENTAL RESULTS.

FLUX DISTRIBUTION + PARTICLE + *BETA EMITTER + DOSE CALCULATION, EXTERNAL + MATHEMATICAL TREATMENT + MODEL TESTING + *ABSORPTION + *CONCENTRATION + *DISTRIBUTION + COMPARISON

043101
NIESAR KH
THE INFLUENCE OF DIETARY FAT ON THE INCORPORATION OF T2O IN AVIAN TISSUES
UNIVERSITY OF MUNICH, GERMANY
9 PAGES, ZENTRALBLATT FUER VETERINAERMEDIZIN, VOL. 12, PAGES 644-652 (DECEMBER 1965) (IN GERMAN)

PRINCIPLES FOR RADIOCHEMICAL MEASUREMENT OF H3 AND ITS USE AS TRITIATED H2O IN EXPERIMENTAL STUDIES OF CHAIN LENGTHENING OF MEDIUM LENGTH FATTY ACIDS IN ANIMALS ARE DESCRIBED. TO DETERMINE TOTAL RADIOACTIVITY OF THE TISSUE SPECIMENS, THE SAMPLES WERE COMBUSTED AND THE COMBUSTION PRODUCTS MEASURED BY LIQUID SCINTILLATION. DETERMINATION OF THE SP. ACT. OF THE INDIVIDUAL FATTY ACIDS WAS CARRIED OUT BY A COMBINATION OF GAS CHROMATOGRAPHY AND LIQUID SCINTILLATION MEASUREMENTS. THE VALUES FOR INDIVIDUAL AMINO ACIDS WERE DETERMINED AFTER THEIR SEPARATION ON AUTOMATIC CHROMATOGRAPHIC COLUMNS IN AN ANTHRACENE CELL THAT MADE MEASUREMENT OF RADIOACTIVITY POSSIBLE BY SCINTILLATION METHODS.

COUNTER + CHROMATOGRAPHY + *HEAVY WATER + *MEASUREMENT + *INCINERATION + RADIOBIOLOGY + GAS + PHYSIOLOGY/METABOLISM + *CONCENTRATION + TURNOVER RATE + *ACID + *FAT

043102
KIGOSHI K
NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS
GAKUSHUIN UNIVERSITY, TOKYO
A/AC.82/G/L.693 +. 4 PAGES, AUGUST 1961

KR (10 TO 50 ML) WAS COLLECTED AT TOKYO FROM LIQUID OXYGEN OBTAINED FROM A SMALL-SCALE NITROGEN LIQUEFIER. A REMARKABLE INCREASE IN THE CONCENTRATION OF ATMOSPHERIC KR-85 AFTER THE MIDDLE OF 1960 IS SHOWN. ATMOSPHERIC CO2 WAS COLLECTED AT TOKYO BY ABSORPTION IN NAOH SOLUTION, AND THE RADIOACTIVITY WAS MEASURED. TREE RINGS WERE ANALYZED FOR C-14 AND TRITIUM CONCENTRATIONS. THE CONCENTRATION OF C-14 AND OF TRITIUM IN THE TREE RING ARE REGARDED AS AN ANNUAL MEAN VALUE OF THE C-14 CONCENTRATION IN THE ATMOSPHERE AND OF THE TRITIUM CONCENTRATION IN RAIN WATER. THE CONCENTRATION OF ATMOSPHERIC C-14 HAD A MAXIMUM VALUE AT THE BEGINNING OF 1960, AND THE CONCENTRATION OF TRITIUM DECREASED AFTER 1959 WITH A HALF LIFE OF ABOUT ONE YEAR. THE DATA ARE TABULATED.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

CRUSTACEAN + *CARBON + *KRYPTON + MEASUREMENT + *ATMOSPHERIC POLLUTION + SAMPLING + PRECIPITATION + BIOLOGICAL HALF-LIFE + *CONCENTRATION + PLANT, SPERMATOPHYTE

043103
SIRI W + EVERS J
TRITIUM EXCHANGE IN BIOLOGICAL SYSTEMS
UNIVERSITY OF CALIFORNIA, BERKELEY
14 PAGES, PAGES 71-84 OF TRITIUM IN THE PHYSICAL AND BIOLOGICAL SCIENCES, VOL. II, VIENNA, IAEA, 1962

WHENEVER TRITIUM-LABELED WATER IS EMPLOYED AS A TEST SOLUTE OR TRACER IN BIOLOGICAL SYSTEMS, AN APPRECIABLE EXCHANGE BETWEEN TRITIUM AND LABILE HYDROGEN ATOMS OCCURS THAT FREQUENTLY AFFECTS THE NATURE AND INTERPRETATION OF EXPERIMENTAL RESULTS. THE STUDIES REPORTED ARE CONCERNED WITH THE MAGNITUDE OF THE EFFECT THAT TRITIUM EXCHANGE INTRODUCES INTO MEASUREMENTS OF TOTAL BODY WATER AND WATER METABOLISM IN ANIMALS AND HUMANS.

HEAVY WATER + TRACER, RADIOACTIVE + *WATER + EXPERIMENT + *RADIOBIOLOGY + CONCENTRATION + BLOOD + *RADIATION EFFECT + *TURNOVER RATE + MAMMAL, SMALL + EXPOSURE, IV + LIVESTOCK + *WHOLE BODY

043104
REMY J + MEUNIER J + AEBERHARDT A
BIOLOGICAL STUDY OF A TRITIATED LUMINOUS PAINT
CENTRE D/ETUDES NUCLEAIRES, SACLAY, FRANCE
CEA-2155 +. 12 PAGES, 1962

043104 *CONTINUED*

A POWDERED MIXTURE OF ZINC SULFIDE AND A TRITIATED POLYESTER WAS ADMINISTERED TO RATS BY MEANS OF THE ESOPHAGEAL PROBE. THE DISTRIBUTION OF TRITIUM IN THE ORGAN, AND ITS ELIMINATION, WERE STUDIED. FROM 75 TO 80 PERCENT OF THE POLYESTER UNDERWENT SUFFICIENT DEGRADATION IN THE INTESTINAL MEDIUM TO BE ABSORBED BY THE DIGESTIVE MUCOUS MEMBRANE AND TO BE SUBJECTED TO METABOLIC REACTIONS.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*DEPOSITION + *INGESTION + *ZINC + SULFIDE + PLASTICS + ABSORPTION + *EXCRETION + LIVESTOCK + STOMACH + MAMMAL, RODENT

043105
KLOFT W + SCHULZE EF
USE OF TRITIATED WATER (THO) FOR CONTINUOUS REGISTRATION OF INSECT TRANSPIRATION
UNIVERSITY WUERZBURG, GERMANY + UNIVERSITY OF BONN, GERMANY
4 PAGES, ATOMPRAXIS, VOL. 13, PP. 265-268 (JUNE 1967)(IN GERMAN)

A CONTINUOUS REGISTRATION OF THE INSECT TRANSPIRATION COULD NOT BE REALIZED UNTIL NOW. APPLIED THO MIXES WITH THE NORMAL BODY WATER AND THEREFOR IS RELEASED SIMULTANEOUSLY BY THE INSECT WHILE TRANSPIRING. IT CAN BE CONTINUOUSLY MEASURED AND REGISTERED BY MEANS OF AN IONIZATION CHAMBER OF 100 CC CAPACITY AND A VIBRATING-REED ELECTROMETER WITH RECORDER ATTACHED. TO REDUCE THE MEMORY-EFFECT THE INTERIOR SURFACE OF THE CHAMBER IS PLATED WITH GOLD. ALL ENVIRONMENTAL FACTORS INFLUENCING THE TRANSPIRATION OF INSECTS SUCH AS TEMPERATURE, AIR-HUMIDITY AND WIND VELOCITY CAN BE VARIED IN THE DESCRIBED APPARATURS. THIS METHOD OFFERS THE OPPORTUNITY TO FOLLOW THE COURSE OF TRANSPIRATION QUALITATIVELY OVER A LONG PERIOD AS WELL AS TO DETECT SPONTANEOUS REGULATING EFFECTS.

COUNTER + CHAMBER, ION + HEAVY WATER + *MEASUREMENT + ENVIRONMENT + *ANIMAL, INVERTEBRATE + *EXCRETION

043106
KIGOSHI K + TOMIKURA Y
TRITIUM AND CARBON-14 IN THE TREE RINGS
GAKUSHUIN UNIVERSITY, TOKYO
2 PAGES, BULLETIN OF THE CHEMICAL SOCIETY OF JAPAN, VOL. 34, PAGES 1738-9 (NOVEMBER 1961) (IN ENGLISH)

MEASUREMENTS WERE MADE OF THE CONCENTRATION OF C-14 AND TRITIUM IN THE TREE RINGS OF RECENT YEARS IN ORDER TO OBTAIN THE ANNUAL MEAN CONCENTRATION OF THE ATMOSPHERIC C-14 AND OF THE TRITIUM IN THE RAIN WATER. THE DATA ON C-14 SHOWED A TENDENCY OF THE CONCENTRATION TO DECREASE AFTER 1960, AND IT SEEMED TO HAVE A MAXIMUM VALUE AT THE BEGINNING OF 1960. THE SAME WAS TRUE FOR TRITIUM CONCENTRATIONS. THE DATA SUGGESTED A STRATOSPHERIC RESIDENCE TIME OF 1 TO 2 YEARS.

*CARBON + *MEASUREMENT + RAINOUT + STRATOSPHERE + *ATMOSPHERIC POLLUTION + RADIONUCLIDE UPTAKE + *CONCENTRATION + *PLANT, SPERMATOPHYTE

043152
LEMBECK F + SEWING KF + WINNE D
THE INFLUENCE OF 5-HYDROXYTRYPTAMINE ON THE ABSORPTION OF TRITIATED WATER FROM THE INTESTINE OF THE RAT
UNIVERSITAT, TUBINGEN, GERMANY
10 PAGES, ARCHIV FUER EXPERIMENTELLE PATHOLOGIE UND PHARMAKOLOGIE, NAUNYN-SCHMIEDEBERG, VOL. 247, PG 100-109 (1964)(IN GERMAN)

ABNORMALITIES OF WATER ABSORPTION IN PATIENTS WITH THE CARCINOID SYNDROME, IN WHICH THE SECRETION OF 5-HYDROXYTRYPTAMINE (SCROTONIN) IS MARKEDLY INCREASED, PROMPTED A STUDY OF THE INFLUENCE OF SCROTONIN ON THE ABSORPTION OF TRITIATED WATER (HTO) FROM THE SMALL INTESTINE OF RATS IN SITU. SCROTONIN, GIVEN INTRALUMENALLY (2.5 MG) OR BY INTRAVENOUS INFUSION (5 MICROGRAM/MIN), REDUCED THE RATE OF WATER ABSORPTION ABOUT 50 PERCENT. THIS EFFECT MAY BE CAUSED BY A CHANGE IN INTESTINAL CAPILLARY BLOOD FLOW OR AN INHIBITION OF ACTIVE WATER TRANSPORT.

HEAVY WATER + *ABSORPTION + *CONCENTRATION + DOSIMETRY, CLINICAL + THERAPY + BLOOD + MAMMAL, RAT + *EXPOSURE, IV

043154
WOODS FW + ONEAL D
TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES
DUKE UNIVERSITY, N.C.
2 PAGES, SCIENCE, VOL. 147, PP. 148-49 (JANUARY 8, 1965)

TRITIUM WAS USED TO INVESTIGATE THE WITHDRAWAL BY SMALL TREES OF WATER FROM SOIL AT THREE DEPTHS. WITHIN 4 HOURS OF PLACEMENT AT EACH DEPTH, TRITIUM WAS DETECTED IN THE TRANSPIRED WATER FROM NEARBY TREES. ON THE 3RD DAY AFTER APPLICATION, 38 TIMES MORE TRITIUM (PER UNIT VOLUME) WAS PRESENT IN TRANSPIRED WATER DRAWN FROM SOIL AT A DEPTH OF 0 TO 30.5 CENTIMETERS THAN IN WATER DRAWN FROM THE 61- TO 91.5-CENTIMETER LEVEL.

*HEAVY WATER + *SOIL + EXPERIMENT + RADIONUCLIDE UPTAKE + *RESPIRATION + VEGETATION + *EXCRETION + RADIATION PROFILE + *ELIMINATION + PLANT

043155
THE FREQUENCY OF SISTER CHROMATID EXCHANGES FOLLOWING EXPOSURE TO VARYING DOSES OF H-3 -THYMIDINE OR X-RAYS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
9 PAGES, JOURNAL OF CELL BIOLOGY, VOL. 21, PG 159-167 (1964)

IN THE CHINESE HAMSTER CELL LINE CHEF-125 IN TISSUE CULTURES, SISTER CHROMATID EXCHANGES OCCURRED AT A RATE OF A LITTLE HIGHER THAN ONE PER THREE CHROMOSOMES FOR EACH CELL CYCLE. THE EXCHANGES WERE DETECTABLE BY LABELING WITH H-3 -THYMIDINE AND AUTORADIOGRAPHIC ANALYSES OF CHROMOSOMES AT THE SECOND AND SUBSEQUENT METAPHASES AFTER LABELING HAD OCCURRED. IT WAS CONCLUDED THAT SISTER CHROMATID EXCHANGES ARE NOT CAUSED BY TRITIUM RADIATION AND THEREFORE ARE SPONTAEOUS EVENTS. CULTURES WERE ALSO IRRADIATED WITH ACUTE DOSES OF X-RAYS UP TO 200 R AND SCORED FOR SISTER CHROMATID EXCHANGES. BETWEEN ZERO AND 50 R THERE WAS A STATISTICALLY SIGNIFICANT INCREASE IN THE RATE OF EXCHANGES.

*X-RAY

043180
SKAUEN DM
THE EFFECTS OF TRITIUM OXIDE ON AQUATIC ORGANISMS. FINAL REPORT, JUNE 1, 1962 - JULY 31, 1964
UNIVERSITY OF CONNECTICUT
NYO-3039-1 +. 17 PAGES, OCTOBER 12, 1964

AN ENVIRONMENT OF TRITIATED WATER DID NOT HAVE AN OBSERVED TOXIC EFFECT ON THE COMMON GUPPY. SOME FISH LIVED AS LONG AS TEN MONTHS IN THE TRITIATED WATER, AND LONG-TERM EFFECTS DUE TO THE BUILD UP OF TRITIUM IN THE FISH WERE NOT APPARENT. THERE WERE NO GENETIC CHANGES IN THE THIRD GENERATION OF FISH LIVING IN THE TRITIATED WATER. IT WAS APPARENT THAT THE AMOUNT OF TRITIUM IN THE FISH REACHED EQUILIBRIUM WITH THAT IN THE SURROUNDING WATER. ABOUT 90 PERCENT OF THE TRITIUM PRESENT IN THE FISH WAS IN THE BODY WATER, AND ONLY 10 PERCENT WAS ACTUALLY INCORPORATED IN THE BODY TISSUES. THE TURNOVER OF TRITIUM IN THE FISH MAY HAVE BEEN RAPID.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*HEAVY WATER + *WATER + ENVIRONMENT + *ANIMAL, FISH + BIOACCUMULATION/TURNOVER + CONCENTRATION + AQUATIC ORGANISM + TOXICITY + EFFECT, GENETIC + *RADIATION EFFECT + TURNOVER RATE + WHOLE BODY

043182
FOY JM
THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE MOUSE, RAT, GUINEA-PIG AND RABBIT UNDER TROPICAL CONDITIONS AND THE EFFECT OF CLIMATE AND SALINE DRINKING ON THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE RAT
NIGERIAN COLLEGE OF TECHNOLOGY, IBADAN, NIGERIA
4 PAGES, JOURNAL OF CELLULAR AND COMPARATIVE PHYSIOLOGY, VOL. 64, PAGES 279-82 (OCTOBER 1964)

BODY WATER TURNOVER (THE BIOLOGICAL HALF LIFE OF TRITIUM) WAS DETERMINED IN THE RABBIT, GUINEA-PIG, RAT AND MOUSE UNDER TROPICAL CONDITIONS. THE VALUE INCREASED PROGRESSIVELY (EXCEPT FOR THE RABBIT) WITH BODY SIZE. THE VALUE FOR THE RAT SHOWED LITTLE VARIATION WITH CHANGES IN CLIMATIC CONDITION, FOR INSTANCE TROPICAL SHADE, AIR-CONDITIONED ROOM AND COLD-ROOM. SIGNIFICANT DIFFERENCES WERE ONLY RECORDED BETWEEN THE AIR-CONDITIONED AND THE COLD-ROOM. IN ALL CONDITIONS ANIMALS, DRINKING 0.9 PERCENT SALINE SOLUTIONS HAD A QUICKER WATER TURNOVER.

*HEAVY WATER + *WATER + *BIOACCUMULATION/TURNOVER + *BIOLOGICAL HALF-LIFE + TEMPERATURE + TURNOVER RATE + MAMMAL, SMALL + CELL + LIVESTOCK + WHOLE BODY

043246
MOSER MH + ROBINSON DW + SCHLOERG PR
TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS
UNIVERSITY OF KANSAS
5 PAGES, SURGERY, GYNECOLOGY AND OBSTETRICS, VOL. 118, PG 984-988 (MAY 1964)

THE TRANSFER OF H(3)2O, NA-22, AND CL36 ACROSS BURNED SKIN WAS STUDIED IN 19 PATIENTS. SOLUTIONS OF THE RADIOISOTOPES WERE APPLIED DIRECTLY TO THE SKIN AND LOCAL LOSS OF RADIOACTIVITY WAS MEASURED. ABSORPTION OF ALL THREE ISOTOPES FROM THE SOLUTION EXPOSED TO THE BURN GRANULATION TISSUE WAS RAPID, RANGING FROM 11 TO 56 PERCENT IN 30 MIN. RESULTS INDICATED THAT WATER WAS TRANSFERRED FROM THE GRANULATING TISSUE SURFACE AT NEARLY THE SAME RATE AT WHICH IT WAS ABSORBED. DATA SHOW LARGE TRANSFERS OF WATER AND ELECTROLYTE ACROSS BURNED TISSUE, THAT ABSORPTION IS CONCENTRATION DEPENDENT AND SUGGEST THAT A MORE PHYSIOLOGIC SOLUTION SHOULD HAVE ELECTROLYTIC CONCENTRATIONS APPROXIMATING THOSE OF THE EXTRACELLULAR FLUID.

SODIUM + *WATER + CHLORINE + ABSORPTION + CONCENTRATION + *RADIONUCLIDE TRANSFER + RADIATION EXPOSURE, ACUTE + DOSIMETRY, CLINICAL

043274
WITTNER G
CYTOLOGICAL EFFECTS OF TRITIATED WATER (THO) ON ROOT-TIP MERISTEMS OF ALLIUM CEPA L
LABORATORIO DI GENETICA DELL/ISTITUTO SPERIMENTALE TABACCHI, ROME
CONF-241-3 +. 11 PAGES, FROM 11 INTERNATIONAL CONGRESS OF GENETICS, THE HAGUE, SEPTEMBER 1963

SERIES OF ONION BULBS WERE GROWN IN TRITIATED WATER HAVING SPECIFIC ACTIVITY OF 2.5 MC/ML. THE DOSE ADSORBED BY ROOTS WAS CALCULATED TO BE ABOUT 32 RAD/HR. ONLY ONE SURE CHROMOSOME

043274 *CONTINUED*
REARRANGEMENT, A DICENTRIC ONE, WAS FOUND. THE RESULTS ARE DISCUSSED IN COMPARISON WITH AN ANALOGOUS ONE.

ADSORPTION + HEAVY WATER + *RADIONUCLIDE UPTAKE + *CHROMOSOMAL EFFECT + COMPARISON + LETHAL DOSE + EXPOSURE, ACUTE

043304
RANEY F + VAADIA Y
MOVEMENT OF TRITIATED WATER IN THE ROOT SYSTEM OF HELIANTHUS ANNUUS IN THE PRESENCE AND ABSENCE OF TRANSPORTATION
INSTITUTE OF ARID ZONE RESEARCH, BEERSHEVA, ISRAEL
5 PAGES, PLANT PHYSIOLOGY, VOL. 40, PP. 378-382 (MARCH 1965)

MOVEMENT OF TRITIATED WATER WAS FOLLOWED IN 2- TO 3-WEEK-OLD ROOT SYSTEMS OF HELIANTHUS PLANTS GROWN IN NUTRIENT SOLUTION CONTAINING TRITIATED WATER (THO) AT 20 DEG C. SUNFLOWER PLANTS GROWN 2 WEEKS IN NUTRIENT SOLUTION CONTAINING ONLY H2O WERE DETOPPED AT THE COTYLEDONARY NODE, AND THE ROOT SYSTEM WAS SUBMERGED IN A LARGE VOLUME OF THO. AT VARIOUS TIMES, ROOT SYSTEMS WERE REMOVED FROM THE SOLUTION, BLOTTED, AND ANALYZED FOR TRITIUM.

FLUX DISTRIBUTION + HEAVY WATER + *EVAPORATION + EQUILIBRIUM + *RADIONUCLIDE UPTAKE + BIOLOGICAL HALF-LIFE + CONCENTRATION + PLANT, SPERMATOPHYTE + *ELIMINATION + TRANSPORT

043358
ASCHBACHER PW + KAMAL TH + CRAGLE RG
TOTAL BODY WATER ESTIMATIONS IN DAIRY CATTLE USING TRITIATED WATER
STATE UNIVERSITY, STATION FARGO, N.D.
4 PAGES, JOURNAL OF ANIMAL SCIENCE, VOL. 24, PP. 430-433 (MAY 1965)

TRITIATED WATER (THO) WAS USED WITH LIQUID SCINTILLATION DETECTION AS A METHOD OF ESTIMATING TOTAL BODY WATER AND RUMEN-BLOOD PLASMA EQUILIBRIUM OF WATER IN DAIRY COWS. FOUR NONPREGNANT COWS WERE DOSED INTRAVENEOUSLY WITH 10 MC OF TOH PER 1000 LB BODY WEIGHT. ON THE NEXT DAY BLOOD, URINE, AND MILK SAMPLES WERE TAKEN. A SECOND EXPERIMENT WAS CONDUCTED USING TWO FISTULATED, NONLACTATING JERSEY COWS, DOSED INTRAVENOUSLY WITH 7.5 MC OF THO PER 1000 LB BODY WEIGHT. SAMPLES WERE COUNTED IN A LIQUID SCINTILLATION SPECTROMETER AT -10 C. THE LOG OF T ACTIVITY IN BLOOD PLASMA, URINE, OR MILK PLOTTED AGAINST CUMULATIVE WATER INTAKE RESULTED IN A LINEAR RELATION FOR ABOUT 5 DAYS AFTER DOSING.

COUNTER + HEAVY WATER + INGESTION + *WATER + SAMPLING + MILK + EQUILIBRIUM + BIOLOGICAL HALF-LIFE + BLOOD + *MAMMAL, LARGE + EXCRETION, URINE + EXPOSURE, IV + *WHOLE BODY

043359
WOOLLEY JT
RADIAL EXCHANGE OF LABELED WATER IN INTACT MAIZE ROOTS
UNIVERSITY OF ILLINOIS, URBANA
7 PAGES, PLANT PHYSIOLOGY, VOL. 40, PAGES 711-17 (JULY 1965)

EQUILIBRIUM OF MAIZE (ZEA MAYS) ROOTS WITH TRITIATED WATER WAS COMPARED WITH THEORETICAL CURVES FOR THE SINGLE CELL, SHEET, CYLINDER, AND SPHERE, AND WAS FOUND TO FOLLOW THE CYLINDER CURVE. THIS WAS INTERPRETED TO INDICATE THAT THE EPIDERMIS DOES NOT CONSTITUTE A BARRIER TO THE ENTRANCE OF WATER. THE STELE WAS REMOVED FROM ROOTS AFTER TREATMENT WITH TRITIATED WATER, AND THE EQUILIBRATION OF THE STELE WAS COMPARED WITH THAT OF THE CORTEX.

HEAVY WATER + *AGRICULTURE + DIFFUSION COEFFICIENT + *EQUILIBRIUM + *RADIONUCLIDE UPTAKE + *PHYSIOLOGY/METABOLISM + COMPARISON + TEMPERATURE + CELL + FOOD

043364
LYAGINSKAYA AM + ISTOMINA AG
TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN THE PERIODS OF PRENATAL AND POSTNATAL LIFE
INSTITUTE OF BIOPHYSICS, MOSCOW
4 PAGES, RADIOBIOLOGIYA, VOL. 8, PAGES 859-62 (1968) (IN RUSSIAN)

TRITIUM OXIDE IN A DOSE OF 0.3 MICROCURIE/G, ADMINISTERED TO FEMALE RATS ON THE FIRST DAY OF PREGNANCY, CREATES A SUMMARY TISSUE DOSE IN THE BODY OF THE FEMALE EQUAL TO 305 RAD DURING THE PERIOD OF PREGNANCY. THIS DOSE IS NOT ABSOLUTELY STERILIZING, ALTHOUGH IN SOME OF THE FEMALE RATS PREGNANCY WAS TERMINATED AS A RESULT OF DEATH OF ALL THE EMBRYOS. THE SUMMARY TISSUE DOSE OF 412 RAD, RECEIVED BY THE FETUS, PROVED TO BE 36 PERCENT HIGHER THAN THAT RECEIVED BY THE MOTHER. THE TRITIUM OXIDE CONTENT IN THE WATER EXTRACTED FROM THE FETUS, PLACENTA, AND UTERUS PROVED TO BE THE SAME AS IN THE WATER OF THE OTHER ORGANS.

*OXIDE + *WATER + EMBRYO + LIVESTOCK + FETUS + PLACENTA + UTERUS + WHOLE BODY

043365
CHIRKOVA EN + AVTANDILOV GG
DYNAMICS OF THE ACCUMULATION OF HEAVY HYDROGEN IN THE AQUEOUS PHASE OF THE RABBIT ORGANISM AFTER PROLONGED ADMINISTRATION OF TRITIUM OXIDE

043365 *CONTINUED*
INSTITUTE OF HUMAN MORPHOLOGY, MOSCOW
4 PAGES, RADIOBIOLOGIYA, VOL. 9, PP. 228-31 (1969)(IN RUSSIAN)

IN THE CASE OF PROLONGED DAILY ADMINISTRATION OF TRITIUM OXIDE (0.005 MILLICURIE/G) TO HEALTHY RABBITS, THERE IS AN EXPONENTIAL ACCUMULATION OF TRITIUM IN THE WATER OF THE URINE AND BLOOD - MOREOVER, IN THE AQUEOUS PHASE OF THE BLOOD THE TRITIUM CONCENTRATION BECOMES 15 PERCENT HIGHER THAN IN THE URINE BY THE TIME DYNAMIC EQUILIBRIUM IS REACHED (BY THE 16TH TO 17TH DAY).

*OXIDE + *FLOW, MIXING + EQUILIBRIUM + CONCENTRATION + *BLOOD + MAMMAL, SMALL + *EXCRETION, URINE + LIVESTOCK

043591
THOMPSON RC
STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. GROSS STUDIES ON THE MOUSE
GENERAL ELECTRIC COMPANY, RICHLAND, WASHINGTON
7 PAGES, 2 FIGURES, 4 REFERENCES, JOURNAL OF BIOLOGICAL CHEMISTRY, VOL. 197, PG 81-87 (SEPTEMBER 14, 1951)

TRITIUM, AS THE OXIDE, WAS ADMINISTERED TO MICE BY INTRAPERITONEAL INJECTION. THE RETENTION OF TRITIUM ACTIVITY IN THE BODY WATER AND IN THE DRY CARCASS WAS DETERMINED. THE BIOLOGICAL HALF LIFE OF BODY WATER IN THE MOUSE WAS FOUND TO BE APPROXIMATELY 1.1 DAYS. THE CURVE OF LOSS OF TRITIUM FROM THE TISSUE-BOUND STATE WAS RESOLVABLE INTO COMPONENTS OF 9 DAY AND 90 DAY HALF LIFE, WHICH WERE SHOWN TO BE OF COMPARABLE TRITIUM-BINDING CAPACITY. THE COMPONENTS ARE THOUGHT TO REPRESENT, RESPECTIVELY, THE GROUP OF RELATIVELY DYNAMIC BODY CONSTITUENTS AND THE GROUP OF RELATIVELY STABLE BODY CONSTITUENTS.

*DEUTERIUM + *TRACER, RADIOACTIVE + *WATER + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + TURNOVER RATE + *MAMMAL, SMALL + EXPOSURE, IP + WHOLE BODY

043592
KRICHEVSKY MI + FRIEDMAN I + NEWELL MF + SISLER FD
DEUTERIUM FRACTIONATION DURING MOLECULAR HYDROGEN FORMATION IN A MARINE PSEUDOMONAD
NATIONAL INSTITUTE OF HEALTH + U.S. GEOLOGICAL SURVEY
6 PAGES, 7 FIGURES, 4 TABLES, 16 REFERENCES, JOURNAL OF BIOLOGICAL CHEMISTRY, VOL. 236(9), PG 2520-5 (SEPTEMBER 1961)

A MARINE PSEUDOMONAD EVOLVES MOLECULAR HYDROGEN AS A PRODUCT OF CATABOLISM. EXPERIMENTS WITH RESTING CELLS AND CELL-FREE EXTRACTS DEMONSTRATE THAT THE HYDROGEN IS FORMED BY THE ACTION OF A FORMIC HYDROGENYLASE SYSTEM TYPICAL OF THAT FOUND IN THE COLIFORM BACTERIA. FORMIC HYDROGENLYASE, BUT NO FORMIC DEHYDROGENASE OR HYDROGENASE (I.E. HYDROGEN UTILIZATION), WAS PARTIALLY INHIBITIED BY 33 PERCENT D2O OR COMPLETELY DEUTERATED SODIUM FORMATE. THIS SUPPORTS THE HYPOTHESIS THAT ONE, BUT NOT TWO, OF THE ATOMS IN THE EVOLVED HYDROGEN WAS IN IMMEDIATE EQUILIBRIUM WITH THE MEDIUM.

CHEMICAL REACTION + *DEUTERIUM + HYDROGEN + ANALYTICAL TECHNIQUE + ISOTOPIC FRACTIONATION + EXPERIMENT + *PHYSIOLOGY/METABOLISM

043593
RICHMOND CR + LANGHAM WH + TRUJILLO TT
COMPARATIVE METABOLISM OF TRITIATED WATER BY MAMMALS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
9 PAGES, 3 FIGURES, REFERENCES, JOURNAL OF CELLULAR AND COMPARATIVE PHYSIOLOGY, VOL. 59, PG. 45-53 (JUNE 1962)

TRITIATED WATER WAS USED TO MEASURE THE VOLUME AND TURNOVER OF EXCHANGEABLE BODY WATER IN 7 SPECIES OF ADULT MAMMALS. USING THESE PARAMETERS, THE DAILY TURNOVER OF EXCHANGEABLE BODY WATER WAS CALCULATED FOR EACH SPECIES. AN INTERSPECIES CORRELATION OF THE POWER FUNCTION TYPE BETWEEN DAILY WATER TURNOVER AND SPECIES WEIGHT WAS ESTABLISHED. A PARABOLIC INTERSPECIES CORRELATION WAS ALSO ESTABLISHED BETWEEN TOTAL BODY WATER AND TOTAL BODY SOLIDS FOR THE 7 SPECIES.

*HEAVY WATER + *WATER + RADIONUCLIDE UPTAKE + CONCENTRATION + TURNOVER RATE + MAMMAL, SMALL + MAMMAL, LARGE + RETENTION + *WHOLE BODY

044109
CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.
BALTIMORE GAS AND ELECTRIC COMPANY
1 PAGE, THE WASHINGTON POST, SEPTEMBER 3, 1969

A PROMOTIONAL ADVERTISEMENT BY BGE CO. DEVOTED PRINCIPALLY TO INNOCUOUSNESS OF TRITIUM, VIZ. (1) CHESAPEAKE BAY WATER NOT DRINKABLE BECAUSE SALT WATER, (2) TO ACCUMULATE SO MUCH AS TO ACQUIRE SAME RELATIVE DOSE AS CHEST X-RAY, INDIVIDUAL WOULD NEED TO EAT 30 TONS FISH, CRABS, CLAMS AND OYSTERS, (3) NO BIOLOGICAL BUILDUP BECAUSE OF EXCHANGE MECHANISM, (4) EXPOSURE TO INDIVIDUAL IN SITE VICINITY WILL BE 0.0002 MILLIREM. ALSO, $4.4 MILLION PROCESSING SYSTEM INSTALLED TO REMOVE 99.999 PERCENT OF MOST NUCLIDES AND 97 PERCENT OF THE FEW REMAINING (EXCEPT TRITIUM).

FISSION PRODUCT RELEASE + *RADIATION IN PERSPECTIVE + REACTOR POWER + RADIOACTIVITY RELEASE + *CALVERT CLIFFS 1 (PWR) + *ENVIRONMENTAL CONTROL MEASURE + FOOD CHAIN + N-POWER, SAFETY OF + PROPONENT + SPOKESMAN, UTILITY

044225
PINSON EA
WATER EXCHANGE AND BARRIERS AS STUDIED BY THE USE OF HYDROGEN ISOTOPES
LOS ALAMOS SCIENTIFIC LABORATORY
12 PAGES, 76 REFERENCES, PHYSIOLOGICAL REVIEWS, 32(2), PP. 123-134 (APRIL 1962)

THE CONCEPT OF THE USE OF ISOTOPES AS RELATED TO THE USE OF DEUTERIUM AND TRITIUM IS EXAMINED IN THE LIGHT OF BIOLOGICAL STUDIES ALREADY MADE WITH THESE HEAVY ISOTOPES OF HYDROGEN. WHERE IT HAS BEEN POSSIBLE TO COMPARE THE RATES OF DIFFUSION OF HDO OR HTO WITH H2O ACROSS VARIOUS BARRIERS NO GREAT DIFFERENCE HAS BEEN FOUND IN THE RATES WITH WHICH THESE MOLECULES MOVE ACROSS SUCH BARRIERS.

DEUTERIUM + DIFFUSION + *HYDROGEN + TRACER, RADIOACTIVE + *WATER + THEORETICAL INVESTIGATION + RADIOBIOLOGY + BLOOD + *CELL, MEMBRANE + GI TRACT + LUNG + SKIN + BODY FLUID + METABOLIC KINETICS

044378
PROCEEDINGS FROM VERMONT MEETING
ATOMIC INDUSTRIAL FORUM, INC.
1 PAGE, INFO, SERIES 26, APRIL 1970, PG 7

AEC HAS PUBLISHED PROCEEDING OF HISTORIC VERMONT PUBLIC MEETING. VOLUME CONTAINS (1) PRESENTATIONS OF AEC COMMISSIONERS AND SCIENTISTS, (2) PANEL DISCUSSION BETWEEN AEC AND FOUR PROMINENT CRITICS, (3) PRESS CONFERENCES WITH AEC CONTINGENCY AND CONSERVATIONISTS, (4) 100 PAGES OF WRITTEN QUESTIONS SUBMITTED BY AUDIENCE AND AEC ANSWERS, CONTAINING INFORMATION OF RELATIVE SAFETY OF LIGHT-WATER AND ADVANCED REACTORS, GOVERNMENT THERMAL POLLUTION STUDIES, RECONCENTRATION OF TRITIUM, AND AECS INFORMATION ACTIVITIES.

FISSION PRODUCT RELEASE + *REACTOR, POWER + *ENVIRONMENT + THERMAL POLLUTION + (TAMPLIN A) + N-POWER, SAFETY OF + OPPONENT + PROPONENT + *PUBLIC HEARING + PUBLIC RELATIONS + (TSIVOGLOU E)

044471
LARSON CE
ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS
U.S. ATOMIC ENERGY COMMISSION
38 PAGES, PG 238-275 OF THE HEARINGS BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES, NINETY-FIRST CONGRESS, FIRST SESSION, OCTOBER 28-31, NOVEMBER 4-6, 1969

STATEMENT OF C. E. LARSON, AEC COMMISSIONER ON ENVIRONMENTAL EFFECTS. RADIATION EFFECTS ARE EQUIVALENT TO JET-PLANE FLIGHT ONCE A YEAR. MICE STUDIES AT ORNL AT MUCH HIGHER IRRADIATION LEVELS SHOW VERY SMALL EFFECTS. EFFECTS AT ALLOWABLE LEVELS SO SMALL AS TO BE UNDETECTABLE BY PRESENT TECHNIQUES. GIVES DETAILS OF TYPES AND EFFORTS OF STUDIES ON ENVIRONMENTAL EFFECTS. INCLUDES RADIONUCLIDE CYCLING, SOMATIC AND GENETIC EFFECTS, TRITIUM, KRYPTON-85, THERMAL EFFECTS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*ECOLOGY + EFFLUENT + KRYPTON + REACTOR + THERMAL POLLUTION + *RADIONUCLIDE UPTAKE + FOOD CHAIN

044763
HANAWALT PC
PROGRESS REPORT ON REPAIR OF DAMAGED DNA IN VIVO
STANFORD UNIVERSITY, CALIFORNIA, HERRIN LABS.
SU-326-P-7-X-13 +. 6 PAGES, NOVEMBER 1969

A MUTANT SHOWN TO BE DEFICIENT IN THE E. COLI DNA POLYMERASE IN EXTRACTS HAS BEEN SHOWN BY US TO STILL PERFORM REPAIR REPLICATION IN VIVO AFTER UV IRRADIATION. HOWEVER, THE RESUMPTION OF NORMAL REPLICATION AFTER IRRADIATION IS DELAYED (AS COMPARED TO THE PARENT STRAIN). ALSO, THE MEAN MOLECULAR WEIGHT OF PARENTAL DNA (AS DETERMINED BY ALKALINE SUCROSE GRADIENT METHOD) DOES NOT RETURN TO NORMAL AS RAPIDLY IN THE IRRADIATED MUTANT AS IN THE IRRADIATED PARENT.

AVAILABILITY - USAEC, DIVISION OF TECHNICAL INFORMATION EXTENSION, P.O. BOX 62, OAK RIDGE, TENNESSEE 37830

CHROMATOGRAPHY + *RADIATION INJURY TREATMENT + RESEARCH CONTRACT + *DNA + ENZYME + *MUTATION + *POLYMERIC + IN VITRO

045046
HARRISON FL + KORANDA JJ
TRITIATION OF AQUATIC ANIMALS IN AN EXPERIMENTAL FRESHWATER POOL
LAWRENCE RADIATION LABORATORY, LIVERMORE, CALIFORNIA
UCRL-72930 +. 35 PAGES, AUGUST 3, 1971

FRESHWATER ANIMALS (CLAMS, CRAYFISH, AND GOLDFISH) AND ALGAE SHOWED HALF TIMES OF LESS THAN A DAY FOR EQUILIBRATION OF MORE THAN 95% OF TISSUE WATER TO THE SPECIFIC ACTIVITY OF POOL WATER. THE SPECIFIC ACTIVITY OF THE TISSUE WATER OF A PLANT (CATTAILS) REACHED ONLY 60-70% OF THAT OF THE POOL WATER SINCE THERE WAS INTERCHANGE WITH ATMOSPHERIC WATER THROUGH THE LEAVES. RATIOS OF THE SPECIFIC ACTIVITY OF THE ORGANICALLY BOUND TRITIUM TO THE SPECIFIC ACTIVITY OF TISSUE WATER WERE 1.0 FOR ALGAE, 0.62-0.99 FOR CATTAILS, 0.60 FOR THE VISCERAL ORGANS OF CLAMS AND FISHES, AND 0.30 FOR THE MUSCLE TISSUE. CONSUMPTION OF 1 KILOGRAM OF THE ANIMAL TISSUE WOULD GIVE A WHOLE BODY DOSE OF ABOUT 4 MREM, WHEN THE RADIOACTIVITY OF THE POOL WATER WAS ABOUT 0.05 MICROCURIES/ML.

045046 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CRUSTACEAN + *DOSE CALCULATION, INTERNAL + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + PHYTOPLANKTON + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + PHYSIOLOGY/METABOLISM + FOOD CHAIN + *AQUATIC ORGANISM + PLANT, SPERMATOPHYTE + SPECIFIC ACTIVITY + PLANT, ALGAE/FUNGI + CONCENTRATION FACTOR + ECOSYSTEM, MODEL + MOLLUSC + RETENTION FUNCTION

045087
MASON BJ + WIPPER WJ + LEAVITT VD
TRITIUM UPTAKE FOLLOWING A THEPMONUCLEAR TEST
PUBLIC HEALTH SERVICE, LAS VEGAS, NEVADA
STI/PUB-276 + CONF-690317 +. 8 PAGES, PG. 167-174 OF THE PROCEEDINGS OF THE SEMINAR ON AGRICULTURAL AND PUBLIC HEALTH ASPECTS OF ENVIRONMENTAL CONTAMINATION BY RADIOACTIVE MATERIALS, VIENNA, AUSTRIA, 1969

PRESENTS RESULTS OF A STUDY TO EVALUATE THE UPTAKE OF TRITIUM BY SELECTED CROPS THAT ARE IMPORTANT TO NEVADAS AGRICULTURAL ECONOMY. TO DETERMINE THE DISTRIBUTION OF TRITIUM FROM THIS DETONATION, A FOUR-STATION TRANSECT WAS LOCATED ALONG THE AXIS FROM THE SEDAN CRATER TO THE FARM FACILITY. A GRAPH OF THE 1968 TRITIUM PROFILE IN THE SOIL INDICATES A MAXIMUM CONCENTRATION AT A DEPTH OF APPROXIMATELY 70 CM. THIS DEPTH IS CLOSELY CORRELATED WITH THE DEPTH OF THE OF THE MAXIMUM DESERT RAINFALL PENETRATION FOR THIS AREA. THIS STUDY HAS INDICATED THAT TRITIUM IS AVAILABLE OVER CONSIDERABLE PERIODS OF TIME AND DOES NOT LEAVE THE ENVIRONMENT VIA EVAPORATION AS HAS BEEN SUGGESTED.

SURFACE CONTAMINATION + TESTING + *AGRICULTURE + *NEVADA TEST SITE + *NUCLEAR DETONATION + *SOIL, NUCLIDE OCCURRENCE + EVAPORATION + PRECIPITATION + CORRELATION + *RADIONUCLIDE UPTAKE + VEGETATION + DISTRIBUTION + RADIATION PROFILE + PLANT

047885
REHNBERG BF + MOGHISSI AA + WHEELER JK + COLVIN MC
PERCUTANEOUS ABSORPTION BY RATS OF TRITIUM FROM A LUMINOUS COMPOUND
SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY, ALABAMA
4 PAGES, 1 FIGURE, 2 TABLES, 14 REFERENCES, HEALTH PHYSICS, 22(1), PP. 31-34 (JANUARY 1972)

PERCUTANEOUS ABSORPTION OF TRITIUM FROM A LUMINOUS COMPOUND BY RATS WAS EXPERIMENTALLY DETERMINED. THE EFFECTS OF ROUTINE AND THOROUGH WASHING, THE LATTER DETERMINED BY U.V. MONITORING, WERE STUDIED. THE EXCRETION OF THE ABSORBED TRITIUM FOLLOWED A TWO COMPARTMENT EXPONENTIAL FUNCTION. IN ADDITION TO THE BIOLOGICAL HALF-LIFE EQUAL TO THAT OF TRITIATED WATER, A SHORTER BIOLOGICAL HALF-LIFE WAS OBSERVED.

*ABSORPTION + *BIOLOGICAL HALF-LIFE + EXCRETION + LUMINARY + *MAMMAL, RAT

047898
WHEELER JK + MOGHISSI AA + REHNBERG BF + COLVIN MC
COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS
EASTERN ENVIRONMENTAL RADIATION LABORATORY, ALABAMA
4 PAGES, 2 FIGURES, 1 TABLE, 4 REFERENCES, HEALTH PHYSICS, 22(1), PP. 35-38 (JANUARY 1972)

A SINGLE ORAL DOSE OF A TRITIATED LUMINOUS COMPOUND IN COMMON USAGE BY THE LUMINOUS DIAL PAINTING INDUSTRY WAS GIVEN TO RATS AND CATS, AND THE TRITIUM CONCENTRATION FOLLOWED IN THE URINE, FECES AND VARIOUS BODY TISSUES. A MAJOR FRACTION OF THE ABSORBED TRITIUM WAS ELIMINATED WITH A BIOLOGICAL HALF-LIFE ESSENTIALLY THE SAME AS THAT OF TRITIATED WATER.

*DOSE + *ABSORPTION + *BIOLOGICAL HALF-LIFE + CONCENTRATION + COMPARISON + MAMMAL, SMALL + LUMINARY + *MAMMAL, RAT + *EXCRETION, FECAL + EXCRETION, URINE

048349
SEYMOUR AH
EFFECTS OF TRITIUM Y-90, AND SR-90 + Y-90 ON THE LARVAE OF THE PACIFIC OYSTER, ESTIMATION OF BIOLOGICAL HALF-LIFE FOR ZN IN OYSTER
UNIVERSITY OF WASHINGTON, SEATTLE
RLO-2047-5(APP.C.D) +. 6 PAGES, JUNE 27, 1969

THE THRESHOLD CONC. OF THE THREE RADIONUCLIDES WHICH IMPAIRED DEVELOPMENT OF PACIFIC OYSTER LARVAE WITHIN 48 HR WAS ABOUT THE SAME FOR Y-90, SR-90, AND TRITIUM, 1 X 10(-3RD) CI/L. FOLLOWING INCORPORATION OF ZN-65, OYSTERS, WHICH WERE RETURNED TO THEIR NATURAL HABITAT AND REMEASURED IN MONTHLY INTERVALS, SHOWED NO GREATER LOSS OF ZN-65 THAN EXPECTED BY PHYSICAL DECAY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

OCEAN AND SEA + STRONTIUM + YTTRIUM + *RADIONUCLIDE UPTAKE + *BIOACCUMULATION/TURNOVER + *AQUATIC ORGANISM + GROWTH/DEVELOPMENT + BONE

049222
FOY JM + SCHNIEDEN H
ESTIMATION OF TOTAL BODY WATER (VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, RABBIT, GUINEA PIG, AND MAN, AND OF THE BIOLOGICAL HALF-LIFE OF TRITIUM IN MAN
UNIVERSITY COLLEGE, IBADAN, NIGERIA
8 PAGES, 3 FIGURES, 3 TABLES, 19 REFERENCES, JOURNAL OF PHYSIOLOGY/LONDON, VOL. 154, PP. 169-176 (1960)

PURPOSE IS TO DESCRIBE HOW FAR SCINTILLATION COUNTER TECHNIQUES CAN BE APPLIED TO THE DETERMINATION OF TRITIUM IN URINE AND PLASMA AND THE ESTIMATION OF DEGREE OF ERROR INVOLVED. THE USE OF SUCH TECHNIQUES FOR A COMPARATIVE STUDY OF TOTAL BODY WATER IN A NUMBER OF MAMMALIAN SPECIES AND OF WATER TURNOVER UNDER TROPICAL CONDITIONS IN ONE SPECIES, NAMELY MAN, IS ALSO PRESENTED.

COUNTER + *ERROR ANALYSIS + *BIOLOGICAL HALF-LIFE + CONCENTRATION + *MAMMAL + BLOOD + TURNOVER RATE + EXCRETION, URINE + *BODY FLUID

049533
CAHILL DF + YUILE CL
SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL DEVELOPMENT
UNIVERSITY OF ROCHESTER SCHOOL OF MEDICINE AND DENTISTRY, N.Y.
CONF-690501 +, 5 PAGES, 6 TABLES, 5 REFERENCES, PG. 283-287 OF THE PROCEEDINGS OF THE NINTH ANNUAL SYMPOSIUM ON RADIATION BIOLOGY OF THE FETAL AND JUVENILE MAMMAL, RICHLAND, WASHINGTON, MAY 5-8, 1969

TERM FETAL ORGAN WEIGHTS ARE TABULATED FOR MALE AND FEMALE RAT, AS WELL AS ORGAN-BOUND TRITIUM, SPLEEN BEING HIGHEST IN MICROCURIES PER MILLIGRAM AT ALL 3 DOSE LEVELS STUDIED. ORGANICALLY BOUND TRITIUM WAS PROPORTIONAL TO LEVELS OF TRITIUM IN BODY FLUIDS AND SEEMS TO BE PROPORTIONAL TO LEVELS IN WATER EXCEPT FOR A DILUTION FACTOR OF ABOUT 30%.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

INGESTION + OXIDE + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + PREGNANT + MAMMAL, RAT + EXPOSURE, CHRONIC + FETUS + KIDNEY + LIVER + SPLEEN + TESTIS + FEMALE + MASS + ORGANIC + BRAIN + EFFECT, DOSE + HEART + THYMUS

049587
LAMBERT BE + CLIFTON RJ
RADIATION DOSES RESULTING FROM THE INGESTION OF TRITIATED THYMIDINE BY THE RAT
RADIOLOGICAL PROTECTION SERVICE, BELMONT, SUTTON, SURREY, ENGLAND
7 PAGES, 4 FIGURES, 3 TABLES, 25 REFERENCES, HEALTH PHYSICS, VOL. 15, PG 3-9 (1968)

7-8 WEEK-OLD, 125 GRAM RATS GIVEN A SINGLE IP OR ORAL DOSE OF 0.4 MICROCURIE OF THYMIDINE-6-T PER GRAM OF BODY WEIGHT, SPECIFIC ACTIVITY 1.0 CURIE PER MILLIMOLE, WERE SACRIFICED IN GROUPS OF 4 AT 0.5, 1, 2, 4, 6, 8, 10, 12 AND 24 HOURS FROM WHICH LIVER AND BLOOD RETENTION CURVES WERE PLOTTED. ORAL AND IP DOSES IN REMS PER MILLICURIE ARE AS FOLLOWS - (9, 18.5 RESPECTIVELY), BONE MARROW (12, 42.5), SPLEEN (11, 33.5), THYMUS (9, 17.0), SMALL INTESTINE (11, 32.5), LUNG (9, 1?.5). AUTHORS ESTIMATE THAT ABOUT 2 PERCENT OF INGESTED THYMIDINE CROSSES GUT WALL INTO BLOODSTREAM, A LARGE PROPORTION OF WHICH IS CATABOLIZED IN LIVER TO TRITIATED WATER AND AN UNKNOWN PROPORTION CATABOLIZED TO NON-VOLATILE EXCRETORY PRODUCTS.

INGESTION + *DOSE CALCULATION, INTERNAL + ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + DISTRIBUTION + BLOOD + BONE, MARROW + MAMMAL, RAT + EXPOSURE, IP + GI TRACT + LIVER + LUNG + SPLEEN + TESTIS + MALE + RETENTION FUNCTION + DAY + THYMIDINE + THYMUS

049588
STANDEVEN RM + CLARKE DA
ESTIMATION OF RADIATION DOSES TO TISSUES AFTER ADMINISTRATION OF TRITIATED CORTICOSTEROIDS TO THE RAT
RADIOLOGICAL ROTECTION SERVICE, BELMONT, SUTTON, SURREY, ENGLAND
8 PAGES, 2 FIGURES, 6 TABLES, 25 REFERENCES, THE BRITISH JOURNAL OF RADIOLOGY, VOL. 30, PG 48-55 (1967)

DIFFERENCES IN SECRETION RATES OF ADRENOCORTICAL HORMONES HAVE BEEN RELATED TO DISEASES SUCH AS LIVER CIRRHOSIS. PATIENT ORGANS RECEIVING HIGHEST DOSES AND ESTIMATION OF HAZARDS TO WORKERS CONSTITUTE MAJOR OBJECTIVES OF THE WORK. ALONG THE GI TRACT OF THE RAT TRITIUM CONCENTRATIONS WERE LESS THAN 0.5 MICROCURIE PER GRAM OF TISSUE EXCEPT ILEUM AND JEJUNUM WHERE IT WAS HIGHER. A 2-EXPONENTIAL FOR CORTISOL-1,2-T WAS FITTED FOR KIDNEY FROM 0 TO 24 HOURS, WITH SPECIFIC ACTIVITY OF 61 MILLICURIE PER MILLIGRAM, DOSE BEING 11.4 MICROCURIES, EACH POINT OF CURVE REPRESENTING AN AVERAGE OF 18 RATS. AT 30 MINUTES LIVER HAD HIGHEST CONCENTRATION OF 18 ORGANS ANALYZED, BEING 300 NANOCURIES PER GRAM OF WET WEIGHT, FOLLOWED BY KIDNEY AT 11.

*DOSE CALCULATION, INTERNAL + CORRELATION + RADIONUCLIDE UPTAKE + PHYSIOLOGY/METABOLISM + DISTRIBUTION + BLOOD + MAMMAL, RAT + EXPONENTIAL FUNCTION + FAT + FETUS + GI TRACT + GLAND + KIDNEY + LIVER + LUNG + LYMPH NODE + MATURE + MUSCLE + OVARY + PANCREAS + PLACENTA + SPLEEN + TESTIS + RADIOPHARMACEUTICAL + RETENTION FUNCTION + ADRENAL + BRAIN + DAY + HEART + *STEROID + THYMUS

049600
CHIPPERFIELD B
TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL DIPHOSPHATE
UNIVERSITY OF CAMBRIDGE + ADDENBROOKES HOSPITAL, ENGLAND
15 PAGES, 9 FIGURES, 4 TABLES, 24 REFERENCES, INTERNATIONAL JOURNAL OF CANCER, VOL. 2, PG 381-395 (1967)

049600 *CONTINUED*
3 TRITIATED FORMS OF THE TITLE COMPOUND WERE STUDIED - (1) 6 POSITION OF THE B RING TRITIATED, (2) 6,7 POSITIONS, AND (3) 5,6,7 POSITIONS, AND USED IN THERAPEUTIC AMOUNTS ON 16 PATIENTS WITH DIFFERENT CANCERS. FROM DATA OBTAINED, THE FOLLOWING BIOLOGICAL HALF-LIVES WERE CALCULATED (THE COMPOUND USED UNSPECIFIED) - HEART 5.7, LUNG 6.2, SMALL INTESTINE 7.6, KIDNEY 7.8, SKELETAL MUSCLE 9, BONE MARROW 12.5, LIVER 14.5, TESTIS 17, SPLEEN 23.8, AND BRAIN 34.5, THE RESPECTIVE STANDARD DEVIATIONS BEING 1.0, 1.3, 1.3, 1.8, 4.5, 7.5, 6.5, 2.1, 2.6, AND 10. WET-TISSUE CONCENTRATIONS FOR CASE 119 IN MICROCURIES PER GRAM FOR THE SAME RESPECTIVE ORGANS WERE 15.0, 16.5, 12.2, 48.6, 13.1, 11.8, 21.5, 20.8, 17.7, AND 15.9.

*BIOMEDICAL + DOSE CALCULATION, INTERNAL + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + PHYSIOLOGY/METABOLISM + DISTRIBUTION + BONE, MARROW + *CANCER + INTESTINE, LARGE + EXPOSURE, IV + *KIDNEY + LIVER + LUNG + MAN + MUSCLE + INTESTINE, SMALL + SPLEEN + TESTIS + THYROID + ORGANIC + IC PATHOLOGICAL + PATHOLOGY + RADIOPHARMACEUTICAL + RETENTION FUNCTION + BRAIN + HEART + MONTH + PHYSICOCHEMICAL FORM

049604
THOMPSON RC
STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. I. GROSS STUDIES ON THE MOUSE
GENERAL ELECTRIC COMPANY, RICHLAND, WASHINGTON
7 PAGES, 2 FIGURES, 4 REFERENCES, JOURNAL OF BIOLOGICAL CHEMISTRY, VOL. 197, PG 81-87 (1952)

12 MALE AND 8 FEMALE MICE WERE INJECTED DAILY OVER 13 DAYS FOR A TOTAL OF 1.2 MILLICURIES AND SERIALLY SACRIFICED OVER 30 DAYS. POINT SCATTER AFTER 10TH DAY DID NOT JUSTIFY A FIT, BUT AN INITIAL SLOPE CORRESPONDING TO A BIOLOGICAL HALF-LIFE OF 1.1 DAYS WAS FITTED AND CONSIDERED TO BE THAT OF BODY WATER. SLIGHTLY LESS THAN 10 PERCENT OF THE TRITIUM AFTER 2 WEEKS WAS NOT REMOVED WITH THE BODY WATER, THIS BOUND TRITIUM AMOUNTING TO 0.5-1 PERCENT OF THE TRITIUM ADMINISTERED. A 2ND SERIES OF MICE SACRIFICED OVER 160 DAYS GAVE DATA POINTS WHICH, WHEN FITTED WITH A TWO EXPONENTIAL FOR THE WHOLE BODY RETENTION, GAVE A 9-DAY AND A 90-DAY BIOLOGICAL HALF-LIFE, THOUGHT TO REPRESENT A GROUP OF RELATIVELY DYNAMIC BODY CONSTITUENTS AND A GROUP OF RELATIVELY STABLE CONSTITUENTS.

OXIDE + WATER + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + MAMMAL, MOUSE + EXPOSURE, IP + MATURE + PROTEIN + WHOLE BODY + FEMALE + MALE + RETENTION FUNCTION + MONTH

049607
KHOROBRYKH VV
EFFECT OF SEASON AND TEMPERATURE ON PERCUTANEOUS ABSORPTION OF TRITIUM OXIDE
5 PAGES, HYGIENE AND SANITATION, 34 (1,2,3), PG 206-210 (1969)

AT 30 C, ABSORPTION OF HTO VAPOR THROUGH MOUSE SKIN WAS 20 +- 1.7 MG PER CM2 PER MIN. (DELONG ET AL, AM J ROENT 71, 1038 (1954)). WHEN THE HAND IS IMMERSED IN WATER CONTAINING HTO AT 34 C, ABSORPTION RATE VARIES FROM 0.029 TO 0.065 MG PER CM2 PER MIN. (PINSON ET AL., J APPL PHYSIOL 10, 108 (1957)). USING 94 FEMALE RATS WEIGHING 203 + OR - 0.9 GM, AUTHORS FOUND THAT APPLICATION OF 0.1 ML OF A SOLUTION CONTAINING 2.03 MILLICURIES BY A TUBE WITH A 2 CM2 WINDOW FOR 4 HR AT DIFFERENT AIR TEMPERATURES AND TIMES OF THE YEAR GAVE THE FOLLOWING ABSORPTIONS IN PERCENT OF AMOUNT APPLIED - WINTER 0.71 + OR - 0.12, SPRING 2.57 + OR - 0.48, SUMMER 3.20 + OR - 0.21 AND AUTUMN 2.03 + OR - 0.30.

OXIDE + *THERMAL CONSIDERATION + ENVIRONMENT + *ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TEMPERATURE + MAMMAL, RAT + *EXPOSURE, SKIN + ORGAN

049639
LYAGINSKAYA AM + ISTOMINA AG
TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN PERIODS OF PRENATAL AND POSTNATAL LIFE
INSTITUTE OF BIOPHYSICS, MINISTRY OF HEALTH, USSR, MOSCOW
AEC-TR-7013 +, 6 PAGES, TRANSLATED FROM RADIOBIOLOGIYA, VOL. 8, PG. 859-862 (1968)

180-190 GRAM RATS WERE INJECTED WITH A DOSE OF 3 X 10 (EXP -4) PER GRAM OF BODY WEIGHT, BOTH PREGNANT AND NONPREGNANT, AND SACRIFICED ON 22ND DAY OF PREGNANCY, 10 RATS TOTAL. ELIMINATION FROM THE AQUEOUS PHASE OF THE MOTHERS BODY WAS 2 EXPONENTIAL. IN THE NONPREGNANT FEMALES, 79 PERCENT WAS ELIMINATED FROM THE AQUEOUS PHASE IN 3.1 DAYS, AND IN THE PREGNANT 84 PERCENT IN 2.7 DAYS, THE REMAINING AMOUNTS IN THE 1ST DAY. AUTHORS SUGGEST DECREASED ELIMINATION TIME MAY BE DUE TO (1) INCREASED METABOLISM AND (2) MORE RAPID BODY-WEIGHT INCREASE IN PREGNANCY. TRITIUM OXIDE CONTENT OF THE WATER EXTRACTED FROM UTERUS, PLACENTA, AND FETUS WAS THE SAME AS IN THE WATER OF THE MATERNAL ORGANS, NAMELY 1.5 X 10 (EXP -6) CURIES PER ML.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

OXIDE + DOSE CALCULATION, INTERNAL + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *CONCENTRATION + TOXICITY + *DISTRIBUTION + BLOOD + *PREGNANT + BONE + MAMMAL, RAT + FETUS + LIVER + MUSCLE + PLACENTA + SKIN + UTERUS + FEMALE

049684
PATZER RG
RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE IGENSTION
UNIVERSITY OF MICHIGAN
98 PAGES, 13 FIGURES, 8 TABLES, 43 REFERENCES, 1968 (THESIS), T 6636

049684 *CONTINUED*
PRESENCE OF NONLABILE TRITIUM IN TISSUES OF MAN AFTER INTAKE OF HTO WAS NOT ACKNOWLEDGED BY ICRP IN 1959 FOR CALCULATING MAXIMUM PERMISSIBLE INTAKES, AND SO THE PURPOSE OF THESIS WAS TO COMPARE DOSE FROM NET (NON-EXCHANGEABLE TRITIUM) WITH THAT CALCD ON ASSUMPTION THAT ALL OF THE TRITIATED WATER INTAKE IS TO BE FOUND IN BODY WATER ONLY, USING A TOTAL OF 6 RATS AND 3-COMPARTMENT MODEL. AUTHORS RESULTS DO NOT WARRANT, IN HIS OPINION, ANY CHANGE IN THE RECOMMENDED MPC OF ICRP 1959, SINCE THE LONG-TERM COMPONENT DOES NOT ADD TOO SIGNIFICANTLY TO ORGAN DOSES. FOR EXAMPLE, 254 DAYS AFTER HAVING CONSUMED 3 MICROCURIES/ML OF TRITIUM OXIDE (HTO) IN DRINKING WATER OVER 111 DAYS, CONTINUOUS, TESTES RECEIVED 51 RADS (CONSIDERING TRITIUM TO BE PRESENT ONLY IN BODY WATER, 1 EXPONENTIAL) AS AGAINST 53 RADS (BODY WATER TRITIUM + NONEXCHANGEABLE TRITIUM).

MPC + OXIDE + *DOSE CALCULATION, INTERNAL + WATER, DRINKING + ICRP + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *DISTRIBUTION + BLOOD + BLOOD, SERUM + BONE, MARROW + *CELL, NUCLEUS + MAMMAL, RAT + EXPONENTIAL FUNCTION + EXPOSURE, CHRONIC + LIVER + MUSCLE + INTESTINE, SMALL + *TESTIS + RETENTION FUNCTION + BODY FLUID + BRAIN + MONTH

049712
VENNART J
THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS
RADIOLOGICAL PROTECTION SERVICE, BELMONT, SUTTON, SURREY, ENGLAND
8 PAGES, 3 TABLES, 27 REFERENCES, HEALTH PHYSICS, VOL. 14, PG 541-548 (1968)

NO ORIGINAL DATA. REVIEWS THE QUALITY FACTOR (QF) AND THE STOPPING POWER OR LINEAR ENERGY TRANSFER (LET) IN TERMS OF THE RELATIVE BIOLOGICAL EFFECTIVENESS (RBE). FOR REPORT OF THE RBE COMMITTEE TO ICRP AND ICRU, SEE HEALTH PHYSICS 9, 357 (1963). LITERATURE VALUES FOR RBE RANGED FROM 1 TO 2 WHEN RATS AND MICE WERE INJECTED IN VIVO WITH TRITIUM OXIDE, AND WHEN HUMAN HELA CELLS, BACTERIAL AND PLANT CELLS, WERE GROWN IN VITRO IN SAME. RBE IS THE INVERSE RATIO OF DOSES FROM TWO RADIATIONS WHICH PRODUCE THE SAME BIOLOGICAL EFFECT. REFERENCE RADIATION IS COMMONLY 175 TO 250 KEV X RAY, OR GAMMA RAYS FROM CO-60 OR RA-226. VARIATION FROM 1 TO 2 OF THE LITERATURE RBE VALUES CAN BE PARTIALLY EXPLAINED IF THE CO-60 OR RA-226 GAMMA RAYS RELATIVE TO 200-KEV X RAYS ARE DIFFERENT FROM UNITY IN BIOLOGICAL EFFECT, AND AT THE RELATIVELY HIGH DOSE RATES COMMONLY USED.

OXIDE + HAZARD, RELATIVE + ICRP + *REVIEW + *RADIOBIOLOGY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + EFFECT, GENETIC + MAN + *RBE + IN VITRO

049713
EVANS AG
NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES
SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA
7 PAGES, 8 FIGURES, 3 TABLES, 12 REFERENCES, HEALTH PHYSICS, VOL. 16, PG 57-63 (1969)

ONLY A SMALL FRACTION OF THE TOTAL DOSE IN ACUTE EXPOSURE IS ATTRIBUTABLE TO LABELING OF ORGANIC MOLECULES IN THE BODY, BUT ANIMAL DATA SHOW THAT SUCH LABELING INCREASES WITH EXPOSURE TIME. IN PAST ANIMAL WORK, EQUILIBRIUM BETWEEN AQUEOUS AND ORGANIC TRITIUM HAS NOT BEEN REACHED WITHIN THE FEW WEEKS STUDIED, AND LONG-TERM ENVIRONMENTAL WORK IS EQUALLY DIFFICULT BECAUSE OF THE VERY LOW TRITIUM CONCNS IN THE NATURAL ENVIRONMENT. 52 DEER KILLED OVER 4 MONTHS IN THE SAVANNAH RIVER PLANT AREA WERE ANALYZED FOR TRITIUM AND THE AVERAGE BODY-WATER CONCN FOUND TO RANGE FROM 4 TO 55 PICOCURIES/ML, AND COMBUSTION WATER FROM FREEZE-DRIED TISSUES (7 ORGANS) RANGED FROM 8 TO 39 PICOCURIES/ML, OR AN ORGANIC TRITIUM CONTENT OF 8 PICOCURIES/ML OF COMBUSTION WATER FROM THE ORGANIC MATTER OF DRY TISSUES ANALYZED WHEN BODY-WATER TRITIUM CONCENTRATIONS WERE EXTRAPOLATED TO ZERO.

SAVANNAH RIVER PLANT + ENVIRONMENTAL CONTROL MEASURE + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + *DISTRIBUTION + MAMMAL, LARGE + EXPOSURE, CHRONIC + FAT + KIDNEY + LIVER + MUSCLE + SPLEEN + BODY BURDEN + EXPOSURE, BACKGROUND + BODY FLUID + BRAIN + HEART

049714
BOND VP + FEINENDEGEN LE
INTRANUCLEAR H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION ASPECTS
BROOKHAVEN NATIONAL LABORATORY
14 PAGES, 2 FIGURES, 1 TABLE, 66 REFERENCES, HEALTH PHYSICS, VOL. 12, PG 1007-1020 (1966) T2765

NO ORIGINAL DATA. REVIEW. AUTHORS CONCLUDE THAT THE OBSERVED BIOLOGICAL EFFECTS OF TRITIATED THYMIDINE (3HTDR) ARE PREDICTABLE ON BASIS OF AVERAGE ABSORBED DOSE TO NUCLEUS. WHILE RECOIL ENERGY (3EV) OF THE HE ATOM FROM TRANSMUTATION OF THE 3H ATOM IN THE THYMIDINE MOLECULE IS INADEQUATE TO RUPTURE CHEMICAL BONDS, CHEMICAL CONSEQUENCES COULD RESULT FROM THE MOLECULAR EXCITATION, WITH SOMATIC AND GENETIC EFFECTS. 3H BETA IN WATER HAS AN AVERAGE RANGE OF 1 MICRON. IN A 2 MICRON UNIT DENSITY SPHERE 37 PERCENT OF THE TOTAL ENERGY ESCAPES. NUCLEAR VOLUME INCREASES DURING DNA SYNTHESIS. AUTHORS CONSIDER THE EDGE EFFECT (ESCAPE OF BETAS AT THE NUCLEAR SURFACE).

*DOSE CALCULATION, INTERNAL + AUTORADIOGRAPHY + *REVIEW + RADIOBIOLOGY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + CHROMOSOMAL EFFECT + PHYSIOLOGY/METABOLISM + TOXICITY + EFFECT, GENETIC + INSECT + DNA + HISTOPATHOLOGY + BONE, MARROW + MAMMAL, RAT + EXPOSURE, IV + MAN + RBE + TUMOR + ORGANIC + IN VITRO + MAMMAL, RODENT + EFFECT, DOSE + THYMIDINE

050527
JOHNSON BC
USE OF RADIOISOTOPES IN RESEARCH IN ANIMAL METABOLISM.
TID-7554 +.

RADIOISOTOPE + ANIMAL + ORGAN

051223
BIDDULPH C
AN ANALYSIS OF TRANSLOCATION IN THE PHLOEM OF THE BEAN PLANT USING THO, P-32, AND C-14.
PLANT PHYSIOLOGY 32 PAGES 608-619 1957

CARBON + PHOSPHORUS + FOOD CHAIN + DISTRIBUTION + PLANT

051225
GAGE RS
RADIOAUTOGRAPHY OF TRITIATED PHOTOSYNTHATE ARISING FROM HTO.
PLANT PHYSIOLOGY 35 PAGES 65-68 1960

AUTORADIOGRAPHY + PLANT

051226
RANEY FC
MOVEMENT AND DISTRIBUTION OF TRITIATED WATER IN PLANTS.
CALIF U THESIS +.

DIFFUSION + WATER + EVAPORATION + VEGETATION + DISTRIBUTION

051228
CLINE JF
ABSORPTION AND METABOLISM OF TRITIUM OXIDE AND TRITIUM GAS BY BEAN PLANTS.
PLANT PHYSIOLOGY 28 PAGES 717-723 1953

OXIDE + GAS + ABSORPTION + VEGETATION + FOOD CHAIN + DISTRIBUTION

051309
HODGES TK
UPTAKE AND TRANSPORT OF RADIOCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT
CHLORIDE STATUS.
PLANT PHYSIOLOGY 39 PAGES 104-108 1964

WATER + CHLORIDE + RADIONUCLIDE UPTAKE + VEGETATION + TRANSPORT

051313
ORDIN L
DIFFUSION OF TRITIATED WATER INTO ROOTS AS INFLUENCED BY WATER STATUS OF TISSUE.
PLANT PHYSIOLOGY 36 PAGES 331-335 1961

DIFFUSION + WATER + VEGETATION + DISTRIBUTION

051314
SPALDING JF
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A
TEST SYSTEM.
RADIATION RESEARCH 4 PAGES 221-227 1956

TESTING + EFFECT + BIOCHEMICAL + VEGETATION + FOOD CHAIN + BETA RAY

051402
TRUJILLO TT
BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS.
LA-1986 +.

INHALATION + GAS + EFFECT + HIGH + BIOCHEMICAL + CONCENTRATION + MAMMAL, MOUSE

051573
RICHMOND CR
ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES
CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND TRITIUM.
LAMS-2526 +.

051573 *CONTINUED*
MPC + WATER + ZINC + RADIOISOTOPE + ANIMAL + CONCENTRATION + RADIONUCLIDE TRANSFER + COMPARISON + MAN

051582
THOMPSON RC
STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.
JOURNAL OF BIOLOGICAL CHEMISTRY 206 PAGES 101-107 1954

DEUTERIUM + TRACER + COMPARISON + TURNOVER RATE + MAMMAL, RAT

051589
WOOD BJB
THE TRITIUM RATE EFFECT IN TYROSINASE-CATALYZED HYDROXYLATION.
ARCHIVES OF BIOCHEMISTRY AND BIOPHYSICS 98 PAGES 479-484 1962

ELEMENTS AND ISOTOPES + RATE + EFFECT

051628
DELONG CW
PERCUTANEOUS ABSORPTION OF TRITIUM OXIDE.
AMERICAN JOURNAL OF ROENTGENOLOGY, RADIUM THERAPY AND NUCLEAR MEDICINE 71 PAGES 1038-1045 1954

OXIDE + ABSORPTION + MAMMAL, RAT + SKIN

051748
THOMPSON RC
THE GROSS RETENTION AND METABOLISM OF TRITIUM OXIDE IN THE MOUSE.
HW-20092 +.

OXIDE + MAMMAL, MOUSE + RETENTION

051965
BAPREIRA F
BETA HISTORADIOGRAPHY WITH TRITIUM.
INTERNATIONAL JOURNAL OF APPLIED RADIATION AND ISOTOPES 14 PAGES 428-429 1963

AUTORADIOGRAPHY + BONE + BETA RAY

051967
BASERGA R
UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.
LABORATORY INVESTIGATION 11 PAGES 360-364 1962

RADIONUCLIDE UPTAKE + MAN + TUMOR + THYMIDINE

051968
BATEMAN AJ
MUTATIONS INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.
NATURE 193 PAGES 705-706 1962

EFFECT, GENETIC + MAMMAL, MOUSE + THYMIDINE

051975
BEHKI RM
INCORPORATION OF TRITIATED THYMIDINE INTO DEOXYRIBONUCLEIC ACID BY ISOLATED NUCLEI.
BIOCHIMICA ET BIOPHYISCA ACTA 68 PAGES 34-44 1963

ACID + MAMMAL, RAT + MITOCHONDRIA + THYMIDINE

052180
DREW RM
ACTION OF TRITIATED THYMIDINE ON THE CLONAL GROWTH OF MAMMALIAN CELLS.
RADIATION RESEARCH 11 PAGES 535-544 1959

EFFECT + BEHAVIOR + MAMMAL + GROWTH/DEVELOPMENT + CELL + THYMIDINE

QUASTEL MR
CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED THYMIDINE.
RADIATION RESEARCH 18 PAGES 46-57 1963

DOSE + DAMAGE + HIGH + RECOVERY + RADIATION EXPOSURE + MAMMAL, RAT + THYMIDINE

052980
SOLOMON AK
THE KINETICS OF BIOLOGICAL PROCESSES. SPECIAL PROBLEMS CONNECTED WITH THE USE OF TRACERS.
ADVANCES IN BIOLOGICAL AND MEDICAL PHYSICS 3 PAGES 65-97 1953

TRACER + BIOCHEMICAL + RADIONUCLIDE TRANSFER + MAN

053130
WIMBER DE
EFFECTS OF INTRACELLULAR IRRADIATION WITH TRITIUM.
BNL-7049 +. ADVANCES IN RADIATION BIOLOGY 1 PAGES 85-115 1964

EFFECT + ANIMAL + RADIATION EXPOSURE

053417
SKAUEN DM
TRITIUM IN ECOLOGY. A REVIEW.
RADIOECOLOGY 6 PAGES 603-609 1963

ECOLOGY + REVIEW

053555
RACHMELER M
THE EFFECTS OF TRITIUM DECAY ON DNA. PROGRESS REPORT, JUNE 1, 1966 TO DECEMBER 31, 1966.
COO-1603-1 +.

BACTERIA + EFFECT + CHROMOSOMAL EFFECT + DECOMPOSITION

054673
GOLOFEDER A
BIOLOGICAL PROPERTIES AND RADIOSENSITIVITY OF TUMOURS. DETERMINATION OF THE CELL-CYCLE AND TIME OF SYNTHESIS OF DEOXYRIBONUCLEIC ACID USING TRITIATED THYMIDINE AND AUTORADIOGRAPHY.
NATURE 207 PAGES 612-614 1965

AUTORADIOGRAPHY + BIOCHEMICAL + RADIOSENSITIVITY + ACID + TUMOR + THYMIDINE

054728
LORD BI
CELLULAR PROLIFERATION IN NORMAL AND CONTINUOUSLY IRRADIATED RAT BONE MARROW STUDIED BY REPEATED LABELLING WITH TRITIATED THYMIDINE.
BRITISH JOURNAL OF HAEMATOLOGY 11 PAGES 130-143 1965

RADIATION EXPOSURE + BONE + BONE, MARROW + CELL + MAMMAL, RAT + THYMIDINE

054625
CHORNEY W
RADIATION EFFECTS OF CARBON-14 AND TRITIUM ON GROWTH OF SOYBEANS.
RADIATION BOTANY 5 PAGES 257-263 1965

CARBON + EFFECT + GROWTH/DEVELOPMENT + RADIATION EFFECT

054897
WORMAN FCV
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.
LA-1641 +.

BIOCHEMICAL + MAMMAL, MOUSE + BETA RAY + THYMUS

054914
FURCHNER J
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN RATS.

054914 *CONTINUED*
LA-1544 +.

IRON + RADIONUCLIDE UPTAKE + BIOCHEMICAL + MAMMAL, RAT

055111
BARTON CJ + BUTLER HH + CUMMING RB + ROHWER PS
THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS
11 PAGES, 1 TABLE, 2 REFERENCES, NUCLEAR SAFETY, 13(3), PP. 225-235 (MAY-JUNE 1972)

A TRITIUM SYMPOSIUM SPONSORED BY THE WESTERN ENVIRONMENTAL RESEARCH LABORATORY OF THE ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA AT LAS VEGAS WAS HELD IN LAS VEGAS AUG. 30 TO SEPT. 2, 1971. NEARLY 100 PAPERS WERE PRESENTED COVERING A BROAD RANGE OF TOPICS, INCLUDING TRITIUM PRODUCTION, ITS MOVEMENT IN THE ENVIRONMENT, ENVIRONMENTAL RELEASE AND MONITORING, DETECTION AND MEASUREMENT, BIOLOGICAL EFFECTS, BIOKINETICS, APPLICATIONS IN BIOLOGY AND MEDICINE, AND HEALTH PHYSICS. THIS ARTICLE TOUCHES ON ALL ASPECTS OF THE MEETING, BUT PAPERS OF PARTICULAR INTEREST IN THE FIELD OF NUCLEAR SAFETY ARE EMPHASIZED.

*AIRBORNE RELEASE + *BIOMEDICAL + MONITOR, LIQUID + *MONITOR, AIR + ANALYTICAL TECHNIQUE + *MONITORING SYSTEM, RADIATION

056179
UDEKWU FAO + KOZOLL DD + MEYER KA
DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE
10 PAGES, JOURNAL OF NUCLEAR MEDICINE, VOL. 4, PG. 60-69 (1963) (T6531)

USING A MODIFIED LANGHAM METHOD (J LAB CLIN MED 47, 819 (1967)) PRESENT AUTHORS ESTIMATED TOTAL BODY WATER IN 100 MALE PATIENTS OF ALL AGES BY INJECTING 2 MILLICURIES IN THE ADULTS, 1 MILLICURIE INTO CHILDREN AND 0.1 MILLICURIE INTO INFANTS AND NEWBORNS, FOLLOWED BY BLOOD SAMPLINGS AT 1.5, 2.5, 3.5 AND 4.5 HR POSTINJECTION, AND EXTRAPOLATING TO ZERO TIME ON SEMILOG PAPER TO CALCULATE TOTAL BODY WATER. MEAN VALUES OF GROUPS OF 10 PATIENTS IN EACH AGE DECADE ARE TABULATED AS FOLLOWS - AGE GROUPD, MEAN AGE, WT IN KG, SURFACE AREA IN SQ METERS, TOTAL BODY WATER IN LITERS AND PER CENT BODY WATER, FOR MALES - 1 TO 10 YEARS, 5.6 YRS, 21.53 KG, 0.82 SQ.M., 13 LITERS WATER, 64.86 PERCENT WATER - 11 TO 20, 16.4 57.94, 1.64, 37.96, 65.83 - 21 TO 30, 27.2, 77.52, 191, 43.65, 57.54 - 31 TO 40, 34.4, 76.9, 1.91 44.6, 57.20 - 41 TO 50, 45.4, 69.64, 1814, 39.24, 56.39 - 51 TO 60, 53.5, 70.81, 1.825, 40.47, 57.39 - 61 TO 70, 64.2, 70.72, 1.79, 37.89, 54.49 - 71 TO 80, 73.1, 69.86, 1.776, 35.26, 52.2 - 81 + 83.6, 59.61, 166, 29.51, 49.84.

OXIDE + *WATER + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + EFFECT, AGE + IMMATURE + MAN + MATURE + NEWBORN + AGED + *WHOLE BODY + FEMALE + YOUNG + MALE + INFANT

056181
BURTON RM + SOOD MA
DISTRIBUTION AND EXCRETION OF TRITIUM LABELED CEREBROSIDES (GALACTOSYL CERAMIDE) RADIOACTIVITY BY MONKEYS
WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, MISSOURI, + NATIONAL INSTITUES OF NEUTOLOGICAL DISEASES AND BLINDNESS, BETHESDA, MD.
5 PAGES, LIPIDS, 4(6), PG. 496-500 (1969)(T7122)

TRITIUM-LABELED GALACTOSYL CERAMIDE (40 MG SUSPENDED IN 25 ML NORMAL SALINE, SP. ACT. 1200,000 CPM/MR INJECTED INTO LEFT LEG VIEN OF A 3 MACACA MULATTOS. BLOOD, URINE, FECES, AND ORGANS ANALYZED FOR CEREBROSIDES AND RADIOACTIVITY AT 1 HR, 8 HR AND 37 DAYS. UNFORTUNATELY THE AUTHOR DOES NOT GIVE FACTOR FOR CONVERTING CPM TO DPM. RESULTS IN ORDER OF KEYWORDS ORGANS LISTED BELOW ARE GIVEN FOR ORGAN WET WT IN GRAMS AND TOTAL RADIOACTIVITY IN CPM FOR MONKEY B AT 1 HR, C AT 8 HRS, AND D AT 37 DAYS, STARTING WITH SPLEEN. SKELETAL THEN HEART MUSCLE. CEREBRUM THEN CEREBELLUM. CNS KEYWORD REFERS TO SPINAL CORD. MONKEYS WEIGHED BETWEEN 2.500 AND 2.530 KG, MONKEY B RECEIVING 55 X 10 (EXP 6) CPM, C 40 X 10 (EXP 6) AND D 55 X 10 (EXP 6). SOME WET WTS GIVEN AS A RANGE FOR THE 3 MONKEYS. 4 TO 4.9, 335 X 10 (EXP 3), 406 X 10 (EXP 3), 703 X 10 (EXP 3), 51 TO 110, 3670 X 10 (EXP 3), 4000 X (EXP 3), 6740 X 10 (EXP 3). (ALL REMAINING CPM VALUES ARE X 10 (EXP 3)). KIDNEYS 8 TO 12, 372, 102, 153. (FOR PAIRED ORGANS VALUES INCLUDE BOTH). ADRENALS 1, BLANK, 6, 153. 1, BLANK, BLANK, BLANK. TESTES 1, BLANK, 1, BLANK. 1, BLANK, 4, BLANK. 296 TO 490, 0, 76, 338. 5, 5, 11, 178. 11 TO 15, 53336, 27200, 15150. 1100, BLANK, 836, BLANK. 7 TO 9, 108, 13, 18. 71 TO 74, 144, 441.17. 8 TO 9, 7, 3, 0.4. 5, 1, 0.7, 2. 100 TO 109, 964, 508, 135.

RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + DISTRIBUTION + MORPHOLOGY + MAMMAL, PRIMATE + BONE, MARROW + CNS + *EXCRETION, URINE + EXPOSURE, IV + FAT + KIDNEY + LIVER + LUNG + LYMPH NODE + PANCREAS + SPLEEN + TESTIS + MALE + *MASS + *ORGAN + ORGANIC + RETENTION FUNCTION + ADRENAL + BLOOD, PLASMA + BRAIN + MONTH

056628
MARTIN, JR + JORDAN, CF + KOPANDA, JJ + KLINE, JR
RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY
CONF-700101(VOL.1) +. 17 PAGES, PP. 422-438 OF THE PROCEEDINGS OF THE SYMPOSIUM ON ENGINEERING WITH NUCLEAR EXPLOSIVES, LAS VEGAS, NEVADA, JANUARY 14-16, 1970

SEVERAL EXPERIMENTS ON THE MOVEMENT OF TRITIUM IN A TROPICAL ECOSYSTEM HAVE BEEN CONDUCTED IN THE MONTANE RAINFOREST OF EASTERN PUERTO RICO. TRITIATED WATER WAS USED AS A TRACER FOR WATER

056628 *CONTINUED*
MOVEMENT IN, MATURE EVERGREEN TREES OF THE CLIMAX RAINFOREST, SOIL AND SUBSTORY VEGETATION, AND RAPIDLY GROWING SUCCESSIONAL SPECIES. BASED ON ALL EXPERIMENTAL DATA, THE DISTRIBUTION OF TRITIUM FROM A SIMULATED RAINOUT FOLLOWING A ONE MEGATON THERMONUCLEAR DETONATION IS PRESENTED FOR A CLIMAX TROPICAL RAINFOREST AND FOR SUCCESSIONAL VEGETATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FALLOUT + ECOSYSTEM + ECOSYSTEM, FOREST + ECOSYSTEM, TROPICAL

057579
VAUBERT, B + BITTEL, R
THE HAZARD FROM TRITIUM CONTAMINATION
CENTRE D/ETUDES NUCLEAIRES DE FONTENAY-AUX-ROSES, FRANCE
CEA-BIB-182 + EUR-4522F +. 1970

CONTENTS - OBJECTIVE OF THIS REPORT. NUCLEAR CHARACTERISTICS. FORMATION AND ASSOCIATED HAZARDS. BEHAVIOR VIS-A-VIS HYDROGEN, OXYGEN, WATER AND VARIOUS ORGANICS OF BIOLOGICAL IMPORTANCE. RADIOCHEMISTRY. EXCHANGE REACTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIBLIOGRAPHY + OCEAN AND SEA + RADIATION IN PERSPECTIVE + *HAZARD, RELATIVE + RIVER + *LAKE + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER

058835
WADE L + SHAW EI
PRELIMINARY ESTIMATE OF THE HAZARD FROM INGESTION OF TRITIATED THYMIDINE
UNIVERSITY OF KANSAS, LAWRENCE
13 PAGES, 5 FIGURES, 3 TABLES, 22 REFERENCES, RADIATION RESEARCH, VOL. 43, PG 403-415 (1970) (T7336)

FOR ESTIMATING HAZARD TO MAN OF INGESTED TRITIATED THYMIDINE, ASSUMPTIONS MADE WERE (1) THAT MAN IS A MOUSE METABOLICALLY, (2) THAT ALL THE NONVOLATILE TRITIUM (-10 DEG C FREEZE-DRY) IS LOCATED IN THE NUCLEUS, (3) THAT THE VOLATILE TRITIUM IS WATER AND UNIFORMLY DISTRIBUTED, (4) THAT ACTIVITY IN EACH TISSUE DECREASES EXPONENTIALLY WITH TIME, (5) THAT TISSUE ACTIVITY REMAINS CONSTANT DURING 1ST 24 HOURS AFTER STOMACH-TUBE ADMINISTRATION. NUCLEAR RADIUS OF DIFFERENT ORGAN CELLS (2.8 TO 5.0 MICRONS) AND CELL VOLUMES WERE MEASURED FROM PHOTOMICROGRAPHS IN AN ATLAS OF ULTRASTRUCTURE, BY RHODIN, SAUNDERS (1963). FASTED 10-20 WEEK-OLD MICE (17-31 G) WERE GIVEN 1 OR 10 MICROCURIES (SP. ACT. 1.9 CURIES/MILLIMOLE) BY STOMACH TUBE OR SC. NONVOLATILE TRITIUM IN MICROCURIES TIMES 10 (EXP -7) PER MG WET TISSUE AT 1,2,4,8,16,30,60 DAYS, RESPECTIVELY ARE GIVEN IN ORDER OF KEYWORD ORGANS LISTED BELOW AS FOLLOWS FOR 10 MICROCURIE INGESTION - 21, 14, 13,9.0,5.2, 1.5, 0.80, - 45, 42, 30, 15, 6.2, 4.5, 2.4 - 40, 26, 16, 9, 3.1, 1.9, 2 - 27, 15, 19, 7, 3, 2, 0.08 - 80, 79, 28, 11, 2.2, 1.3, 1.1 - 100, 70, 30, 14, 3, 1.8, 1.3. ALSO 1 MICROCURIE TO WHICH DATA THE DESIRED RETENTION FUNCTIONS CAN BE FITTED. EFFECT AT 15 RADS TO NUCLEUS OBSERVED.

INGESTION + HAZARD, RELATIVE + *DOSE CALCULATION, INTERNAL + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TOXICITY + DISTRIBUTION + DNA + *CELL, NUCLEUS + MAMMAL, MOUSE + EXPOSURE, SC + KIDNEY + LIVER + MATURE + MUSCLE + INTESTINE, SMALL + SPLEEN + TESTIS + MALE + ORGANIC + *RETENTION FUNCTION + DISTRIBUTION, MICRO + EFFECT, DOSE + MONTH + THYMIDINE

060607
HATCH FT + MAZRIMAS JA + KORANDA JJ + MARTIN JR
ECOLOGY AND RADIATION EXPOSURE OF KANGAROO RATS LIVING IN A TRITIATED ENVIRONMENT
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
11 PAGES, RADIATION RESEARCH, 44(1), PP. 97-107 (1970)

KANGAROO RATS LIVING NEAR THE CRATER RESULTING FROM A NUCLEAR DETONATION WERE TRITIATED. THE H-3 ACTIVITY OF BODY WATER AND TISSUES RANGED FROM 0.1 TO 0.4 MICROCI. PER G. ORGANICALLY BOUND H-3 HAD APPROXIMATELY THE SAME SP. ACTIVITY AS BODY WATER (6-8 X 10(6TH) DPM/(G OF H). THE ANIMALS WERE IN EQUIL. WITH THEIR FOOD SUPPLY, IN TERMS OF H-3 CONCN. THE LIFETIME CHRONIC RADIATION DOSE TO ADULT ANIMALS WAS ABOUT 10 RADS FROM INTERNAL H-3. ABOUT 10 RADS WAS ALSO RECEIVED FROM PERSISTENT EXTERNAL RADIONUCLIDES IN THE SOIL.

*FALLOUT + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + RADIATION SOURCE, INTERNAL + *MAMMAL, RAT + FOOD

061100
ROSENTHAL GM + STEWART ML
TRITIUM INCORPORATION IN ALGAE AND TRANSFER IN SIMPLE AQUATIC FOOD CHAINS
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS + CHICAGO UNIVERSITY, CHICAGO, ILLINOIS
CONF-710501-24 +. 16 PAGES, MAY 1971

UPTAKE OF TRITIUM FROM TRITIATED WATER AND FOOD BY ALGAE, WATER FLEAS, FAIRY SHRIMP, SNAILS, AND TREE-FROG TADPOLES INDICATED A 25-30% DISCRIMINATION AGAINST UPTAKE FROM TRITIATED WATER INTO THE ORGANIC MOLECULES OF ALGAL CELL FLUID AND A 3-10-FOLD DISCRIMINATION AGAINST UPTAKE TO BOUND TRITIUM BY THE ANIMALS. THE BOUND TRITIUM CONTENT OF ANIMALS FEEDING ON TRITIATED ALGAE WAS OF THE SAME MAGNITUDE AS THAT OF THE ALGAE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

061100 *CONTINUED*
*WATER + ANL + *RADIONUCLIDE UPTAKE + *ANIMAL + BIOACCUMULATION/TURNOVER + PHYSIOLOGY/METABOLISM + FOOD CHAIN + AQUATIC ORGANISM + LABORATORY EXPERIMENT + INSECT + *PLANT, ALGAE/FUNGI + CONCENTRATION FACTOR + FOOD

060933
MINDER W
INTERNAL CONTAMINATION WITH TRITIUM
EIDGENOFSSISCHES GESUNDHEITSAMTES, BERN
5 PAGES, STRAHLENTHERAPIE, VOL. 137, PG. 700-704 (JUNE 1969)(IN GERMAN)

REPEATED AND LONG LASTING INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS IN AIR LED TO VERY SERIOUS CONTAMINATION EFFECTS WITH FATAL CONSEQUENCES IN ONE CASE. STUDIES OF TRITIUM CONTENT IN URINE DURING 16 MONTHS AFTER STOPPING WORK WITH RADIOACTIVE MATERIAL SHOWED AT LEAST TWO DIFFERENT ELIMINATION VELOCITIES, ONE CORRESPONDING TO BIOLOGICAL HALF LIFE OF MORE THAN FOUR MONTHS, THE OTHER OF THE ORDER OF MAGNITUDE OF WEEKS. DEFINITE FIGURES WERE RATHER STRONGLY INFLUENCED BY THE MODE OF CALCULATION. IN ALL INVESTIGATED ORGANS, TRITIUM WAS BOUND IN A FORM COMPLETELY INSOLUBLE IN WATER.

*INCIDENT, EXPOSURE + *INHALATION + *DOSE CALCULATION, INTERNAL + INCIDENT, FATALITY + BIOLOGICAL HALF-LIFE + CONCENTRATION + EXCRETION, URINE + *ORGAN

061130
BASSON JK + VANAS D + VLEGGAAR CM + VANDERWESTHUSIZEN
RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE
11 PAGES, SOUTH AFRICAN JOURNAL OF SCIENCE, 66(7), PP. 214-225

MEASUREMENTS SINCE 1963 WITH SPECIAL ATTENTION TO 1966-67 SHOWED THE FRENCH NUCLEAR TESTS DID NOT PRODUCE A HAZARDOUS INCREASE. ANALYSES OF AIRBORNE FALLOUT, SR-90 IN MILK, CS-137 IN BONE, TRANSIT TIME AND AGE ANALYSIS, THE RATIO OF CE-144/CS-137 INDICATED FALLOUT AGE, AND SHOWED FALLOUT TOWARDS THE END OF 1966. INCREASES IN CUMULATIVE SR-90 DEPOSITION AND H-3 IN RAIN WERE ATTRIBUTABLE TO INTERHEMISPHERIC MIXING. THE AVERAGE DOSE RATE FOR THE POPULATION WAS CALCD. TO BE 0.9 MRAD/YEAR TO GONADS AND 3.3 TO THE BONE MARROW. (CA 74-10119 N)

CERIUM + CESIUM + *FALLOUT + STRONTIUM + DOSE CALCULATION, INTERNAL + *POPULATION EXPOSURE + *SOUTH AFRICA + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + BONE, MARROW + TESTIS

061721
PLANET J + UZZAN G + LE GRAND J
HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER
CEA, FONTENAY-AUX-ROSES, FRANCE
2 PAGES, HEALTH PHYSICS, VOL. 19, PP. 100-102 (1970)

CONTAMINATION MECHANISMS ARE (1) INHALATION AND SKIN ABSORPTION AND (2) INGESTION OF CONTAMINATED FOOD. THE DOSE TO POPULATIONS WAS ESTIMATED BY CONSIDERING DISPERSION IN THE AIR AS A FUNCTION OF METEOROLOGICAL CONDITIONS, CONTAMINATION OF RAIN BY WASHOUT FROM THE ATMOSPHERE, CONTAMINATION OF THE WATER TABLE, CONTAMINATION OF VEGETABLE PRODUCTS TAKING INTO ACCOUNT THE EXCHANGE OF WATER IN THE VAPOUR PHASE BETWEEN THE ATMOSPHERE AND THE EXPOSED PARTS OF PLANTS, OF THE FOLIAR ABSORPTION OF TRITIATED WATER, AND OF UPTAKE THROUGH THE ROOTS, CONTAMINATION OF MILK AND MEAT FROM PASTURE AND FROM THE METHOD OF REARING LIVESTOCK.

*INHALATION + RAINOUT + *WASTE DISPOSAL, ATMOSPHERIC + MILK + WATER, DRINKING + ABSORPTION + RADIONUCLIDE UPTAKE + *FOOD CHAIN + LIVESTOCK + MAN + SKIN

062253
JAWOROWSKI Z + BILKIEWICZ J + ZYLICZ E
INCORPORATION OF TRITIUM IN HAIR
INSTITUTE OF NUCLEAR RESEARCH, WARSAW, ENGLAND
4 PAGES, INTERNATIONAL JOURNAL OF RADIATION BIOLOGY, VOL. 18, PP. 487-490 (1970)

IT WAS DEDUCED FROM EXPERIMENTS WITH RABBITS THAT THE LOWEST DETECTABLE AMOUNT OF TRITIUM ENTERING A HUMAN BODY 1 MONTH BEFORE COLLECTING A 1-GRAM HAIR SAMPLE IS 5 MICROCURIES, WHICH IS 400 TIMES LOWER THAN THE MAXIMUM PERMISSIBLE BODY BURDEN, AND THAT HAIR MAY BE USED FOR DETECTING INTERNAL CONTAMINATION BY TRITIUM.

DOSIMETRY + *ANALYTICAL TECHNIQUE + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + MAMMAL, SMALL + *HAIR + MAN

062623
LAMBERT BF + CLIFTON RJ
RADIATION DOSES RESULTING FROM ADMINISTRATION OF TRITIATED FOLIC ACID AND TRITIATED WATER IN THE RAT
RADIOLOGICAL PROTECTION SERVICE, BELMONT, SUTTON, SURREY, ENGLAND
7 PAGES, BRITISH JOURNAL OF RADIOLOGY, VOL. 40, PP. 56-61 (1967) (T3892)

FROM RAT ORGAN RETENTION DATA AND ICRP (1959) DOSE LIMITS TO ORGANS, PRESENT AUTHORS CONCLUDE THAT TRITIATED FOLIC ACID (I) IS TWICE AS TOXIC AS TRITIATED WATER (II). REMS/MILLICURIE WERE AS FOLLOWS, FOR I AND II RESPECTIVELY - LIVER 91,16 - KIDNEY 65,16 - MARROW 16,15 - BLOOD 7,16 - WHOLE BODY 12,12. GROUPS OF 6 RATS WERE SACRIFICED FROM 1 HR TO 6 WKS AFTER INJECTING 10

062623 *CONTINUED*
MICROCURIES (SP. ACT. 270 MILLICURIES/MILLIMOLE) OF (I) INTRAVENOUSLY. GROUPS OF 4 RATS WERE GIVEN AN IP DOSE OF 220 MICROCURIES OF (II), AND SACRIFICED FROM 1 TO 30 DAYS POSTINJECTION, AN AMOUNT TOO LOW TO FOLLOW ORGANIC TRITIUM (III) AFTER 30 DAYS. 3 PERCENT OF INITIAL ACTIVITY WAS (III), INCREASING TO 50-70 PERCENT BY 30 DAYS. THOMPSON, JBC 200, 731 (1953), AT THE RISK OF ALTERING METABOLISM BY HIGH DOSE, SUGGESTED A 3RD EXPONENTIAL OF 80 TO 300 DAYS BIOL HALF LIFE AFTER INJECTING 15200 MICROCURIES. PRESENT AUTHORS FOUND PEAK ACTIVITY IN NANOCURIES/GM OF TISSUE AS FOLLOWS - KIDNEY OVER 300 WITHIN 30 MIN - LIVER 180 AT 24 HRS - FAT 82 AT 18 HRS - LYMPH NODE 48 AT 24 HRS - GUT 48 AT 17 HRS - PANCREAS 48 AT 19 - MARROW 51 AT 1? - THYMUS 44 AT 18 - SPLEEN 39 AT 21 - ETC. DOSE WAS CALCD BY THE FORMULA OF VENNART AND MINSK., BJR 35, 372 (1962). 1 MILLICURIE OF FOLIC ACID GAVE TO LIVER, KIDNEY, MARROW 90,65,15 REMS, RESPECTIVELY - HTO A UNIFORM DOSE OF 12 REMS/MILLICURIE.

OXIDE + WATER + *DOSE CALCULATION, INTERNAL + ICRP + CRITICAL MASS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + *CONCENTRATION + TOXICITY + DISTRIBUTION + ACID + BONE, MARROW + MAMMAL, RAT + EXPOSURE, IP + EXPOSURE, IV + FAT + GI TRACT + KIDNEY + LIVER + LUNG + LYMPH NODE + MATURE + MUSCLE + PANCREAS + SKIN + SPLEEN + TESTIS + WHOLE BODY + ORGANIC + RADIOPHARMACEUTICAL + RETENTION FUNCTION + BRAIN + HEART + MONTH + THYMUS

064726
BRYANT BJ
INCORPORATION OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE (T2297)
U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, CALIFORNIA
USNRDL-TR-971 +. 22 PAGES, 1966

DNA/PROTEIN ACTIVITY RATIO (RATIO OF DPMS/MG WET TISSUE) FROM 2 HR TO 16 DAYS IS GRAPHED FOR KEYWORD ORGANS AFTER INJECTION INTO 12-WK-OLD MICE OF 2 MICROCURIES OF METHYL-H3-THYMIDINE PER GM OF MOUSE WT (2.0 C/MM, NE NUCLEAR CORP, BOSTON). THE INITIAL (2 HR) RATIOS RANGED FROM 5 IN 2 TISSUES OF LOW DNA SYNTHESIS (LIVER, PANCREAS) TO 35-40 IN 2 OF HIGH DNA ACTIVITY (SPLEEN, SMALL INTESTINE), WHICH IF REPRESENTATIVE, INDICATE THAT FROM 1 TO 10% OF THE INJECTED TRITIUM IS INCORPORATED INTO THE PROTEINS OF THE WHOLE BODY. LACK OF DNA-SPECIFICITY BY TRITIATED THYMIDINE WAS SUGGESTED BY MARSH, J CLIN INVEST 43, 267 (1964) WHO RECOVERED 1% IN PROTEIN AND 2% IN RNA AT 1 HR FROM HUMAN LEUKEMIC CELL SUSPENSION, AND BY FOX, CANCER RES 25, 234 (1965). PROTEIN INCORP OF H3 MAY BE DUE TO (1) IN-VITRO DEGRADATION OR (2) IN-VIVO DEGRADATION. AT SP ACT ABOVE 1 C/MM STORED AT 2-4 DEG C METHYL-H3-THYMIDINE DEGRADES AT 1%/MONTH, APELGOT, J CHIM PHYS 60, 505 (1963), EVANS, NATURE 199, 762 (1963). PRESENT CHROMAT RESULTS WERE IN THIS RANGE (4% IN 6 MONTHS). IN-VIVO PROTEIN LABELING COULD OCCUR BY TRANSMETHYLATION TO AMINO ACID PRECURSORS. THO DID NOT LABEL PROTEINS. 2-C14-THYMIDINE MAY BE MORE DNA SPECIFIC THAN METHYL-H3-THYMIDINE. CF NSIC NO. 40775.

AUTORADIOGRAPHY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + PHYSIOLOGY/METABOLISM + CONCENTRATION + DISTRIBUTION + STABILITY + DNA + MAMMAL, MOUSE + EXPOSURE, IV + LIVER + MATURE + *OBSERVED RATIO + PANCREAS + *PROTEIN + INTESTINE, SMALL + SPLEEN + MALE + ORGANIC + IN VITRO + BLOOD, PLASMA + PHYSICOCHEMICAL FORM + THYMIDINE + WEEK

064727
PINSON EA + LANGHAM WH
PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (T0226)
UNIVERSITY OF CALIFORNIA, LOS ALAMOS SCIENTIFIC LABORATORY
19 PAGES, JOURNAL OF APPLIED PHYSIOLOGY, VOL. 10, PP. 108-126 (1957)

TRITIUM WAS DISCOVERED IN 1939. THIS INDUSTRIAL HEALTH HAZARD STUDY MEASURES (1) ENTRY RATES OF HT AND HTO BY INGESTION, INHALATION AND SKIN ABSORPTION INTO THE BODY, (2) DISTRIB AND RETENTION IN BODY COMPARTMENTS AND TISSUES, (3) EXCRETION RATE OF TRITIUM. SUBJECT EAP INGESTED 100,200,1000 ML OF WATER CONTAINING 1640, 1640, 2920 UCI OF HTO RESPECTIVELY, TO GIVE BODY DILUTION VOLS IN % OF BODY WT AS FOLLOWS - 62,58,62. CORRESPONDING VALUES FOR WHL WERE 100 ML WATER CONTAINING 1640 UCI HTO TO GIVE 62 AND FOR JS 1000,1640,67. SUBJECT WTS WERE 66,60,69 KG RESP. WATER TRANSFERRED FROM GI TRACT TO BLOOD PER UNIT TIME WAS PROP TO VOL INGESTED, VENOUS BLOOD ACTIVITY STARTING 2 TO 9 MIN POSTINGESTION, MAX IN 40 TO 45 MIN, IN AGREEMENT WITH DEUTERIUM DATA OF RITTENBERG, JBC 184,687(1950). 2.5 HR EQUIL ACTIVITIES WERE USED TO CALC ABOVE BODY DIL VOLS, WHICH WERE IN GOOD AGREEMENT WITH SCHLOERB, J CLIN INV 29,1296(1950). SUBJECTS THEN INHALED FOR 4 TO 5 MIN O2 SATD WITH HTO VAPOR BY PASSING THROUGH WATER CONTAINING 1.32 MCI HTO/ML OF HHO. HTO IN BODY FLUIDS AT EQUIL RANGED FROM 22 TO 27 UCI/L, BODY DILUTION VOL FROM 37 TO 46 L, CALCD INCREASE OF HTO IN BODY FROM 819 TO 1080 UCI, HTO INSPIRED FROM 830 TO 1083, 97 TO 100% OF INHALED HTO REACHING THE BODY FLUIDS. CONTD TO NSIC NO. 64728.

INGESTION + INHALATION + MPC + OXIDE + WATER + THERMAL CONSIDERATION + ICRP + PERSONNEL EXPOSURE, RADIATION + GAS + LIQUID + ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + RESPIRATION + PHYSIOLOGY/METABOLISM + BLOOD + EXCRETION, URINE + EXPONENTIAL FUNCTION + *FAT + *GI TRACT + *INTAKE + MAN + MATURE + RBE + *SKIN + MALE + BODY FLUID + HOUR + METABOLIC KINETICS

064728
PINSON EA + LANGHAM WH
PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (T0226)
19 PAGES, JOURNAL OF APPLIED PHYSIOLOGY, VOL. 10, PP. 108-126 (1957)

CONTD FROM NSIC NO. 64727. FOREARM SKIN ABSORPTION OF 3 HUMAN SUBJECTS EXPOSED TO ATMOS SATD WITH HTO VAPOR AT 24 DEG C FROM 1 TO 61 MIN RANGED FROM 0.0044 TO 0.017 MG/CM2/MIN WITH FROM 180 TO 1680 UCI OF HTO ABSORBED. EFFECTS OF WATER AND ALCOHOL RINSES STUDIED, AND OF TEMP, ON SKIN ABSORPTION. AV SKIN ABSORPTION AT 24 DEG C AT GREATER THAN 15 MIN 0.018 MG/CM2/MIN, COMPARABLE TO RATE OF INSENSIBLE PERSPIRATION. HTO IN DRY HUMAN SKIN OR FAT BIOPSIES AFTER 8 MONTHS CHRONIC

064728 *CONTINUED*
EXPOSURE TO HTO THROUGH SKIN, LUNGS AND GI TRACT RANGED FROM 200 TO 500 PICOCURIES/KG DRY WT, BODY FLUID ACTIVITY RANGING FROM 6 TO 70 UCI/L, EQUIV TO 0.05 RAD/WK WHOLE-BODY RADIATION. AUTHORS CALCULATE 62.2% OF BODY WT OF 70 KG MAN TO BE TOTAL BODY WATER (RATHER THAN 71% GIVEN BY ICRP), AND 20% FAT. ADDNL HUMAN DATA. RAT OXIDIZED HT TO HTO 50 TIMES FASTER THAN MAN PER KG OF BODY WT. MICE WERE GIVEN 4.14 UCI/ML OF HTO IN DRINKING WATER FOR 5 MONTHS, BODY FLUIDS 2880 UCI/L, THEN NORMAL WATER INTAKE FOR 32 DAYS, AND DRIED TISSUES BURNED TO GIVE FOLLOWING WATER OF COMBUSTION ACTIVITY IN UCI/L AVERAGE FOR 3 MICE - BRAIN 263, SKIN 183, MUSCLE 135, HEART 94, BONE 91, SPLEEN + THYMUS 67, GI TRACT 49, FAT 49, KIDNEY 48, LIVER 27, URINE 4. ADDNL RAT AND MOUSE DATA.

INGESTION + INHALATION + OXIDE + DOSE CALCULATION, INTERNAL + CORRELATION + GAS + LIQUID + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + TOXICITY + DISTRIBUTION + BONE + MAMMAL, MOUSE + MAMMAL, RAT + *EXPOSURE, CHRONIC + EXPOSURE, IP + FAT + GI TRACT + KIDNEY + LIVER + MUSCLE + SKIN + SPLEEN + BODY FLUID + BRAIN + HEART + MONTH + THYMUS

064735
BASERGA R + LISCO H + KISIELESKI WE
TUMOR INDUCTION IN MICE BY RADIOACTIVE THYMIDINE (T3356)
ARGONNE NATIONAL LABORATORY, ILLINOIS
14 PAGES, 7 TABLES, 32 REFERENCES, RADIATION RESEARCH, VOL. 29, PP. 583-596 (1966)

NO TUMOR INCIDENCE IN MICE 27 MONTHS AFTER INJECTION WITH 10 UCI HTO/GM OF BODY WT. PRESENT AUTHORS CLAIM TO BE THE FIRST TO SHOW WEAK CARCINOGENICITY FOR THYMIDINE-2-C14 (A) AND THYMIDINE-H3 (B) FROM NEW ENGLAND NUCLEAR CO, BOSTON WITH (A) SHORTENING LIFESPAN OF NEWBORNS AT 0.02 UCI/GM AND (B) AT 10 AND 1 BUT NOT 0.1 UCI/GM, ONLY THOSE MICE ALIVE AT 6 MONTHS AND ON WHICH COMPLETE AUTOPSY COULD BE PERFORMED BEING USED TO CALCULATE TUMOR INCIDENCE BY METHOD OF ARKIN AND COLTON, STATISTICAL METHODS, BARNES AND NOBLE, NY (1957) P. 122. NO DOSE DEPENDENCY FOUND, MEAN SURVIVAL TIME OF MICE INJECTED AT BIRTH DECREASED BY 0.02 OR 0.2 BUT NOT 2 UCI OF (A) AT 5% PROBABILITY LEVEL, LUNG TUMORS INCREASED BY 0.1 UCI BUT NOT BY HIGHER DOSES. SP ACT OF (A) WAS 3 MCI/MM AND (B) 360. FOR (A) CUMULATIVE NO. OF TUMORS 33 MONTHS AFTER NEWBORN INJECTION OF 0.02,0.2,2 UCI/GM WERE 18/51, 18/48, 20/50 - FOR (B) AT 0.1,1,10 UCI/GM VALUES WERE 32/60, 49/88, 27/68 - FOR CONTROLS 174/401 - AND FOR 15 UCI OF HTO AT 27 MONTHS 24/90 (THAT IS, 24 TUMORS OUT OF 90 MICE AT RISK). NCI IN DNA FROM 1 GM OF WET TISSUE FOR (A) AND (B) TABULATED FOR KEYWORD ORGANS AT 33 TO 35 MONTHS POSTINJECTION.

CARBON + OXIDE + HAZARD, RELATIVE + CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *CONCENTRATION + *DNA + MAMMAL, MOUSE + EMBRYO + EXPOSURE, IP + EXPOSURE, SC + *GI TRACT + GLAND + KIDNEY + LIVER + LUNG + MATURE + NEWBORN + SPLEEN + TESTIS + *TUMOR + PATHOLOGY + BRAIN + EFFECT, DOSE + HEART + THYMIDINE + YEAR

064736
MCLEISH J + SUNDERLAND N
MEASUREMENTS OF DNA IN HIGHER PLANTS BY FEULGEN PHOTOMETRY AND CHEMICAL METHODS (T1858)
JOHN INNES INSTITUTE, ENGLAND
14 PAGES, 6 FIGURES, 4 TABLES, 32 REFERENCES, EXPERIMENTAL CELL RESEARCH, VOL. 24, PP. 527-540 (1961)

INCREASING INVENTORY FROM NUCLEAR POWER MAKES TRITIUM A RADIONUCLIDE OF INCREASING POPULATION CONCERN. TRITIUM GAS IS LESS HAZARDOUS THAN TRITIATED WATER WHICH IS LESS HAZARDOUS THAN TRITIATED THYMIDINE. REGARDLESS OF AGE, NOT MORE THAN 10% OF INJECTED THYMIDINE IS INCORPORATED INTO MOUSE DNA, NSIC NO. 64738. THE TRITIUM LABEL OF INJECTED THYMIDINE DISTRIBUTES ITSELF 9/1 BETWEEN DNA/PROTEIN, NSIC NO. 64726, INJECTED TRITIATED THYMIDINE BEING WEAKLY CARCINOGENIC ACCORDING TO NSIC NO. 64735. ICRP2 (1959) COULD NOT DECIDE BETWEEN TOTAL BODY AND TOTAL BODY WATER AS THE CRITICAL ORGAN FOR TRITIATED WATER, NSIC NO. 64730. DNA MAY BE THE CRITICAL ORGAN FOR TRITIATED THYMIDINE. THE TOTAL MASS OF DNA IN STANDARD MAN, HAS NOT BEEN PUBLISHED, NOR HIS DAILY INTAKE OF DIETARY THYMIDINE OR DNA. PRESENT AUTHORS HAVE DETERMINED THE MICROGRAMS OF DNA/CELL IN THE ROOT TISSUES OF 10 SPECIES OF HIGHER PLANTS. ONION, BEAN, PEA, CORN AND LETTUCE RESPECTIVELY CONTAINED 7.87, 6.05, 2.14, 1.55, 1.45 GM DNA/CELL X 10 (EXP -11). CHANGES IN ABSOLUTE AMTS OF DNA/CELL IN DIFFERENT ROOT SEGMENTS WERE DUE ONLY TO VARIATIONS IN THE RELATIVE PROPORTIONS OF 2C, 4C, 8C NUCLEI AND NOT TO VARIATIONS IN AMTS OF DNA PER HAPLOID SET OF CHROMATIDS.

RADIONUCLIDE UPTAKE + BIOCHEMICAL + PHYSIOLOGY/METABOLISM + *CONCENTRATION + FOOD CHAIN + *DNA + *PLANT + *CELL + CELL, NUCLEUS + *MODEL, BIOLOGICAL + THYMIDINE + FOOD

064737
SLATER TF + SAWYER B + STRAULI U
DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)
UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, LONDON, ENGLAND
3 PAGES, JOURNAL OF CLINICAL PATHOLOGY, VOL. 17, PP. 554-556 (1964)

CF NSIC NO. 64736. ENVIRONMENTAL TRITIUM GETTING INTO THYMIDINE OF THE PLANT FOOD CHAIN CAN BE INCORPORATED INTO DNA, RNA, AND PROTEIN OF ANIMALS INCLUDING MAN TO THE EXTENT THAT THYMINE OR THYMIDINE CROSSES THE INTESTINAL MEMBRANE. IF DNA IS THE CRITICAL ORGAN (MOLECULE) FOR THYMIDINE TRITIATED IN ONE OR MORE NONLABILE POSITIONS, THEN DOSE IN VARIOUS ORGANS CAN BE CALCD FROM DNA CONTENT OF THOSE ORGANS IF ORGAN UPTAKE AND RETENTION OF THYMIDINE ARE KNOWN. A 70-KG MAN EATS 100 GM PROTEIN/DAY AND IF ALL OF IT WERE CATTLE OR FOWL LIVER WHICH CONTAINS 20% PROTEIN, THEN LIVER CONTAINING 0.34 MG DNA-P/GM FRESH WT (P CONTENT OF DNA 9.23%) WOULD GIVE A DAILY INTAKE OF 1.84 GM DNA/100 GM PROTEIN CONSUMED AS LIVER, ACCORDING TO H.E. SAUBERLICH, U.S. ARMY MED.RES. AND NUTRITION LAB, FITZSIMONS GEN HOSP, DENVER, COLORADO. PRESENT AUTHORS ANALYZED ORGANS OF 3 MALES (60,70,71 YR) AND 2 FEMALES (18,71 YR) TO GIVE FOLLOWING - ORGAN, MEAN WT OF ORGAN (FROM

064737 *CONTINUED*
SPECTOR (1956)), DNA-P IN MG/TOTAL ORGAN WT - LIVER, 1838,186.5 - LUNG, 953,112.0 - SPLEEN, 204,62.0 - KIDNEY, 313,36.8 - BRAIN, 1355,29.8 - TESTIS, 28,4.28 - THYROID, 25,2.6 - PROSTATE, 17,1.38 - ORGAN WTS FOR 20- TO 30-YR-OLD 71-KG MALES. FOR 56-KG FEMALES, OVARY 10,2.53.

CIVIL DEFENSE + ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *CONCENTRATION + FOOD CHAIN + *DNA + PLANT + CELL + CELL, NUCLEUS + MODEL, BIOLOGICAL + MAMMAL, RAT + *MAN + MATURE + RNA + FEMALE + *FOOD INTAKE + MALE + *MASS + *ORGAN + THYMIDINE

064738
HINRICHS HR + PETERSEN RO + BASERGA R
INCORPORATION OF THYMIDINE INTO DNA OF MOUSE ORGANS (T0031)
9 PAGES, ARCHIVES OF PATHOLOGY, VOL. 78, PP. 245-253 (1964)

CF NSIC NOS. 64737, 49587, 49586, 58835. MOUSE TISSUE MOLAR RATIO OF THYMIDINE/DEOXYCYTIDINE/DEOXYGUANOSINE/DEOXYADENOSINE HAS BEEN TAKEN AS 28/21/21/30. AT 30 TO 100 UCI DOSES, MOUSE INCORPORATES INTO DNA 8 TO 9% OF INJECTED TRITIATED THYMIDINE (LABEL POSITION(S) UNSPECIFIED) FROM N.E.NUCL.CORP, BOSTON, 6% AT LESS THAN 30 UCI/MOUSE. AT 100 UCI/MOUSE THERE IS A SHARP DECLINE IN FRACTION OF RADIOACTIVITY FOUND IN WATER. MORE THAN 40% OF TOTAL INJECTED ACTIVITY INCORPORATED INTO DNA WAS FOUND IN SMALL INTESTINE, VARYING WITH ROUTE OF ADMIN AND AGE OF ANIMAL. % OF TOTAL RADIOACTIVITY INCORPORATED INTO DNA AFTER SINGLE IP INJECTION WAS - SMALL INTESTINE 42-43, LARGE INTESTINE 8-8.6, SPLEEN 3.4-5.3, LIVER 1.6-2.3, STOMACH 1.3-1.6, PANCREAS 0.42-0.5, KIDNEYS 0.28-0.44, LUNGS 0.24-0.74, THYMUS 0.16-0.26, UTERUS 0.13-0.17, OVARIES 0.1-0.13, HEART 0.02-0.03, CEREBRUM 0.01, BLOOD LESS THAN 0.01-0.04, ADRENALS LESS THAN 0.01, THYROID LESS THAN 0.01. CARCASS WHICH INCLUDED SUCH ACTIVELY PROLIFERATING TISSUES AS BONE MARROW, SKIN, LYMPH NODES, CONTAINED 40% OF TOTAL ACTIVITY. MICE WEIGHING FROM 22 TO 24 GM CONTAINED A TOTAL OF 14 TO 16 MG OF DNA, DNA CONTENT OF DIPLOID NUCLEI ABOUT 7 PCI, ADULT MOUSE CONTAINING 2 X 10 (EXP +9) CELLS, OR 10 (EXP +8) CELLS/GM TISSUE. ADULT MAN WOULD CONTAIN 7 X 10 (EXP +12) CELLS.

RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *CONCENTRATION + BLOOD + SPECIFIC ACTIVITY + *POPULATION + *DNA + EFFECT, AGE + *CELL + MODEL, BIOLOGICAL + MAMMAL, MOUSE + INTESTINE, LARGE + *EXPOSURE, IP + KIDNEY + LIVER + LUNG + MATURE + OVARY + PANCREAS + INTESTINE, SMALL + SPLEEN + STOMACH + THYROID + UTERUS + FEMALE + MALE + ADRENAL + BRAIN + EFFECT, DOSE + HEART + *THYMIDINE + ORGAN, OTHER

064739
ROBERTSON JS + HUGHES WL
INTRANUCLEAR IRRADIATION WITH TRITIUM-LABELED THYMIDINE (T2241)
BROOKHAVEN NATIONAL LABORATORY, NEW YORK
PAPER FROM THE PROC OF THE FIRST NATIONAL BIOPHYSICS CONFERENCE, COLUMBUS, OHIO, MARCH 1957

PRESENT PAPER IS CONCERNED WITH DOSE CALCN TO AN UNSPECIFIED CELL NUCLEUS USING WHAT IS KNOWN ABOUT THE TRITIUM BETA ENERGY SPECTRUM, ENERGY LOSS RATE BY ELECTRONS IN WATER, ENERGY ABSORBED AS A FUNCTION OF DISTANCE FROM A POINT SOURCE. THE RAD IS DEFINED AS ABSORPTION AT SITE OF INTEREST OF 100 ERGS/GM (62.4 EV PER CUBIC MICRON OF WATER), BUT THE MINIMUM VOLUME WITHIN WHICH THE RAD CONCEPT IS VALID IS IN DOUBT, E.G., ASSUMING THAT 34 EV ARE ABSORBED IN PRODUCING THE IONIZATION OF A SINGLE ATOM WITH AN ATOMIC VOLUME OF 10 (EXP -11) CUBIC MICRONS, THEN THIS EVENT INVOLVES A DOSE OF 3.4 X 10 (EXP +12) EV/U3 OR 10 (EXP +11) RADS TO THE IONIZED ATOM. ONE MAY TAKE THE RAD CONCEPT AS VALID DOWN TO 0.01 MICRON (MEAN FREE PATH OF THE PRIMARY ELECTRON), A HUMAN ERYTHROCYTE BEING ABOUT 10 MICRONS DIAMETER OR 520 CUBIC MICRONS, MANY CELL NUCLEI BEING SEVERAL MICRONS IN DIAMETER. AUTHOR EVALUATES 3 METHODS FOR DETERMINING RANGE IN WATER VS ENERGY FOR MONOENERGETIC ELECTRONS AND THEN RADS/DIS AT VARIOUS MICRON DISTANCES FROM A POINT SOURCE OF TRITIUM - 54 RADS TO AN INNER 0.5 MICRON RADIUS SPHERE, 5.8 RADS TO THE NEXT 0.5 MICRON SHELL. 10% OF THE TOTAL DISINTEGRATIONS HAVE ENERGIES OF 2 TO 3 KEV WHICH DELIVER 83 RADS/DIS TO THE INNER 0.5 MICRON RADIUS SPHERE.

CODES AND STANDARDS + DOSIMETRY + *SOURCE, POINT + *DOSE CALCULATION, INTERNAL + RADIATION UNIT + RADIATION MODEL + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + PLANT + *CELL + CELL, NUCLEUS + MODEL, BIOLOGICAL + ABSORBED FRACTION + ENERGY SPECTRUM + DISTRIBUTION, MICRO + THYMIDINE

064740
OLIVER R + LAJTHA LG
HAZARD OF TRITIUM AS A DNA LABEL IN MAN (T1858)
OXFORD HOSPITAL, ENGLAND
2 PAGES, NATURE, 186(4718), PP. 91-92 (1960)

MAN IS NOT A HELA CELL IN A CULTURE MEDIUM, BUT SINCE THE 1 MICRON AV-RANGE TRITIUM BETA IS ABSORBED WITHIN THE CELL (1/2 MAX DOSE-RATE IN 10 CUBIC MICRONS) A CELLULAR APPROACH IS SUGGESTED TO SOME. 0.03 UCI/GM WITHIN A 500 CUBIC MICRON NUCLEUS DELIVERS 0.06 RAD OR 0.1 REM IN 1 WEEK TO THAT NUCLEUS (CF NSIC NO. 64739), AND IF ADULT MAN HAS 10 (EXP +12) CELLS IN HIS BODY (NSIC NO. 64738) AND ALL OF THEM WERE DIVIDING, THEN PRESENT AUTHORS CLAIM THIS WOULD CONSTITUTE A BODY BURDEN OF 15 UCI AVERAGING OVER TOTAL NUCLEI, OR 0.6% OF THE ICRP2 (1959) VALUE. PAINTER, SCIENCE 127, 1244 (1958), INHIBITED 24-HR GROWTH OF HELA CELLS WITH 5,000 UCI/ML OF TRITIATED WATER AND 5 UCI/ML OF TRITIATED THYMIDINE. A 0.055-MEV PARTICLE DISSIPATES ITS ENERGY WITHIN A 1 MICRON SPHERE TO GIVE AN ABSORBED DOSE OF 168 RADS (286 REMS FOR AN RBE OF 1.7) OR 5 TIMES MORE ENERGY THAN WOULD BE DEPOSITED IN THE 1ST PART OF A C-14 BETA TRACK IN THE SAME VOL. CRONKITE, NSIC NO. 64741, PRODUCED IN-VIVO MITOTIC INHIBITION OF MOUSE SPERMATOGONIA AT 60 HR BY INJECTING 1 UCI/GM OF BODY WT OF H3-THYMIDINE OR BY GIVING 5 R OF EXTERNAL GAMMA IRRADIATION. A GOOD AUTORADIOGRAPHY REQUIRES 6 X 10 (EXP +4) ATOMS/NUCLEUS OF 500 U3 VOL, OR 6 UCI/GM OF NUCLEUS, OR 10 TIMES AS MUCH THYMIDINE IN NUCLEI AS IN WHOLE-BODY. 6 UCI/GM GIVES A DOSE OF 4 RADS (6.8 REMS) IN 60 HRS. BIOL HALF-LIFE OF DNA THYMIDINE IN-VIVO IS NOT KNOWN.

064740 *CONTINUED*
DOSIMETRY + HAZARD, RELATIVE + DOSE CALCULATION, INTERNAL + RADIATION MODEL + REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TOXICITY + CELL + *CELL, NUCLEUS + MODEL, BIOLOGICAL + ABSORBED FRACTION + LINEAR ENERGY TRANSFER + MAN + MITOSIS + RBE + DISTRIBUTION, MICRO + EFFECT, DOSE + THYMIDINE

064741
JOHNSON HA + CRONKITE EP
EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (T2297)
BROOKHAVEN NATIONAL LABORATORY, NEW YORK
7 PAGES, RADIATION RESEARCH, VOL. 11, PP. 825-831 (1959)

MIN DOSE LEVEL AT WHICH TRITIATED THYMIDINE (A) PRODUCES OBSERVABLE RADIATION INJURY TO MAMMALS HAS NOT BEEN DETERMINED, AND THEORETICAL PREDICTION IS NOT EASY. MOUSE SPERMATOGONIA (B) HAVE AN LD50 OF 20 TO 24 R OF EXTERNAL CO60 GAMMA AND ARE AFFECTED BY AS LITTLE AS 5 R ACCORDING TO OAKBERG, J EXPTL ZOOL 134, 343 (1957). FOR HISTOL EVAL OF RADIATION DAMAGE FROM (A) PRESENT AUTHORS USED METHOD OF OAKBERG WHICH INCLUDES FAILURE OF (B) TO PASS SUCCESSFULLY THROUGH 2 MITOSES AND TO DIFFERENTIATE INTO SPERMATOCYTES. THOUGH HIGHLY RADIOSENSITIVE, MOUSE TESTIS MIGHT BETTER BE USED AS A DOSIMETER FOR HOMOGENEOUS HIGH-ENERGY RADIATION SINCE H3 LABELING OF THE SEMINIFEROUS TUBULES IS NOT UNIFORM. AN IP DOSE OF 1 UCI/GM BODY WT OF (A) PRODUCES EFFECT ON (B) COMPARABLE TO THAT PRODUCED BY 5 R OF ACUTE WHOLE-BODY EXTERNAL GAMMA. 5 AND 10 UCI/GM DOSES COMPARABLE TO 10 AND 20 R OF GAMMA RESPECTIVELY. FRACTIONS OF CELLS SURVIVING 0,0.5,1,5,10,20 UCI/GM DOSES WERE RESPECTIVELY 1,0.97,0.92, 0.75,0.65,0.44, EACH REPRESENTING AN AVERAGE OF 80 TUBULES IN 4 MICE AT 60 HR, CORRESPONDING RATIOS OF SPERMATOCYTES/SERTOLI CELLS BEING 4.67,4.52,4.34, 3.49,3.05,2.03. A SERIOUS LIMITATION OF EXPT IS THAT ALL MEMBERS OF THE CELL POPULATIONS STUDIED WERE NOT EQUALLY IRRADIATED.

*HAZARD, RELATIVE + DOSE CALCULATION, INTERNAL + DOSE CALCULATION, EXTERNAL + AUTORADIOGRAPHY + CORRELATION + *SPERM + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TOXICITY + MORPHOLOGY + DNA + CELL + CELL, NUCLEOLUS + MAMMAL, MOUSE + EXPOSURE, IP + MATURE + *MITOSIS + TESTIS + MALE + *EFFECT, DOSE + THYMIDINE

064743
LONG C + KING EJ + SPERRY WM
CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (T1510)
6 PAGES, PP. 643, 676, AND 746 OF BIOCHEMISTS HANDBOOK, LONDON, E. AND F. N. SPON LTD., 1961

ASSUMING 10% P CONTENT FOR DNA AND RNA OF BRAIN, THE GMS OF DNA/KG AND THE GMS OF RNA/KG OF FRESH BRAIN WT CAN BE APPROXIMATED FROM DNA-P AND RNA-P LITERATURE VALUES AS FOLLOWS - MAN 0.4 TO 1.2, 0.6 TO 1.2 - DOG 0.5 TO 0.6, 0.5 TO 1.1 - GUINEA PIG 0.3 TO 1.1, 0.9 TO 2.5 - RAT 1.5, 15 TO 2.0 - CHICKEN 8, 1.65 - FISH 21, 2.65. FRESH BRAIN WTS IN % OF ADULT BODY WT IN SAME ORDER ARE 1.77 TO 3.02 - 0.59 - 0.92 TO 1.33 - 1.22 - 0.40 TO 0.44 - 0.6. THE DNA CONTENT OF LIVER CELLS FOR MAN, GUINEA PIG AND RAT IS ABOUT 10 MICROGRAMS PER 10 (EXP +6) CELLS, FOWL BEING 2.3. FOR ADULT MICE WEIGHING 25 GM, THE CONCN OF DNA IN A 33 MG THYMUS IS ABOUT 3 GM OF DNA/GM OF WET WT TISSUE. FOR RAT PANCREAS (P 737) DNA IS 4.3 GM/KG WET TISSUE AND RNA IS 13.8. FROM DNA CONTENT OF EACH ORGAN THE DOSE TO EACH ORGAN (OR TISSUE) FROM DNA-INCORPORATED 3-THYMIDINE CAN BE CALCD IF ADDNL DATA SUCH AS TURNOVER RATES ARE KNOWN. CF NSIC NOS. 64742, 64740, 64739, 64738, 64736, 64726, 58835, 56180, 49587, 49586. DNA IS NOT CONSTANT HOWEVER, E.G., 18 UG DNA/100 MG WET RAT LIVER IN DAYTIME BUT 73 AT NIGHT ACCORDING TO HORVATH, NATURE 200, 261 (1963).

CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + ANIMAL, FISH + PHYSIOLOGY/METABOLISM + *CONCENTRATION + FOOD CHAIN + *DNA + DIVERSITY, SPECIES + MAMMAL, SMALL + MAMMAL, DOG + MODEL, BIOLOGICAL + MAMMAL, RAT + LIVER + PANCREAS + *RNA + MASS + ORGAN + BRAIN + THYMIDINE + THYMUS + FOOD

064744
PELC SR
LABELING OF DNA AND CELL DIVISION IN SO CALLED NON-DIVIDING TISSUES
KINGS COLLEGE, LONDON, ENGLAND
8 PAGES, 5 TABLES, 12 REFERENCES, JOURNAL OF CELL BIOLOGY, VOL. 22, PP. 21-28, (1964) (T2673)

CF NSIC NOS. 64742, 64737. ACCORDING TO DOLPHIN, AHSB(RP)R-71 (1966) P 17, THYMIDINE CONTENT OF THE BODY (ADULT MAN) IS PROBABLY ABOUT 25 GM. HINRICHS, NSIC NO. 64738, FOUND 15 MG OF DNA FOR A 23 GM MOUSE, AND IF ADULT MAN WERE A 70 KG MOUSE HE WOULD CONTAIN 46 GM OF DNA, BUT IS THE THYMIDINE CONTENT OF MAN IS 25 GM, AND THYMIDINE IS 28% OF DNA WT, THEN THERE SHOULD BE CLOSE TO 90 GM OF DNA IN MAN, OF WHICH 56 GM WOULD BE IN A 1.7 KG BRAIN IF FIGURES CITED IN NSIC NO. 64743 ARE CORRECT. PROLIFERATING ACTIVITY OF A CELL POPULATION DEPENDS ON (1) FRACTION OF NUCLEI UNDERGOING DNA SYNTHESIS, (2) CELLULARITY OF THE TISSUE (NUCLEI/GM). IN ADDN TO POOL SIZES, POOL TURNOVER RATES ARE ESSENTIAL TO A METABOLIC MODEL FOR THYMIDINE DOSIMETRY. LEBLOND, PHYSIOL REV 36, 255 (1956) CALCD FROM MITOTIC RATES FOLLOWING BIOL HALF-LIVES FOR BRAIN, SMOOTH MUSCLE, LIVER, SEMINAL VESICLE - INFINITY, INFINITY, 400, 350 DAYS, WHEREAS THE PRESENT AUTHOR (PELC) GIVES 115, 15, 21, 13 DAYS RESPECTIVELY AS EVIDENCE OF THE INSTABILITY OF DNA DUE TO CELL RENEWAL BY A PROCESS OTHER THAN CELL DIVISION, NAMELY DNA RENEWAL, DETAILS OF THIS NONMITOTIC INCORP OF PRECURSORS INTO DNA NOT YET KNOWN AS MEASURED BY AUTORADIOGRAPHIC COUNTING, 1 HR POSTSACRIFICE.

AUTORADIOGRAPHY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + CONCENTRATION + *DNA + CELL + MAMMAL, MOUSE + EXPOSURE, IP + GI TRACT + KIDNEY + LIVER + MATURE + *MITOSIS + MUSCLE + SPLEEN + TESTIS + BRAIN + HEART + MONTH + THYMIDINE + THYMUS

064745
STEWART PA + QUASTLER H + SKOUGAARD MR + WIMBER DR + WOLFSBERG MF + PERROTTA CA + FERBEL B + CARLOUGH M

064745 *CONTINUED*
FOUR-FACTOR MODEL ANALYSIS OF THYMIDINE INCORP INTO MOUSE DNA AND MECHANISM OF RADIATION EFFECTS (T1252)
BROOKHAVEN NATIONAL LABORATORY, NEW YORK
17 PAGES, RADIATION RESEARCH, VOL. 24, PP. 521-537 (1965)

4-FACTOR MODEL POSTULATED - (1) EXOGENOUS THYMIDINE, (2) ENDOGENOUS THYMIDINE, (3) DNA INCORPORATED THYMIDINE, (4) CATABOLIZED THYMIDINE - BASED ON DNA-SYNTHESIS MODE OF QUASTLER (1963) - ADAPTED FOR THYMIDINE INCORP INTO CELL NUCLEI, USED TO PREDICT MASS EFFECT OF NON-LABELED THYMIDINE INTAKE UPON LABELED THYMIDINE UPTAKE. EXTERNAL IRRAD WITH AN X-RAY MACHINE (120 RADS/MIN) DECREASED LABELED THYMIDINE UPTAKE BY CRYPT CELLS AND INCREASED POOL SIZE OF THYMIDINE TRIPHOSPHATE (TTP). 3 DIFFERENTIALS TO DESCRIBE MODEL. DS/DT IS B2 - B1 - B3S(P1 + P2)F(T) FOR WHOLE POOL, DS1/DT IS -B1S1/S - B3S1 + B4P1F(T) FOR EXOGENOUS NON-TRITIATED THYMIDINE AND DS2/DT IS -B1S2/S - B3S2 + B4P2F(T) FOR EXOGENOUS TRITIATED THYMIDINE, WHERE S IS POOL SIZE IN MOLECULES/CELL, B IS RATE CONSTANT/MIN, P1 IS MOLECULES NON-TRITIATED THYMIDINE, P2 IS MOLECULES TRITIATED THYMIDINE/CELL. B1 APPROXIMATED BY DIVIDING NO. OF THYMIDINE MOLECULES IN DNA OF 1 NUCLEUS BY LENGTH OF S-PHASE, OR 10 (EXP +7) MOLECULES/CELL/MIN FOR INTESTINAL CRYPTS, B2 ABOUT 1.5B1, 1/B3 ABOUT 5 TO 10 MIN, B4 ABOUT 15. TTP POOL IN CRYPT CELL NUCLEI 10 (EXP +6) TO (EXP +7) MOLECULES/CELL. 1 UCI INJECTED IS 8.6 X 10 (EXP -3) UG OF TRITIATED THYMIDINE + 58.6 X 10 (EXP -3) UG OF NON-LABELED. ASSUMING 10 (EXP +9) CELLS/GM OF MOUSE, 1 UG THYMIDINE INJECTED IS 7.3 X 10 (EXP +4) MOLECULES/CELL IN A 34-GM MOUSE IF UNIFORMLY DISTRIBUTED.

COMPUTER, ANALOG + AUTORADIOGRAPHY + *MATHEMATICAL TREATMENT + *RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + SPECIFIC ACTIVITY + DNA + CELL + CELL, NUCLEUS + *MODEL, BIOLOGICAL + MAMMAL, MOUSE + EXPOSURE, IP + MATURE + INTESTINE, SMALL + FEMALE + VARIABILITY + DISTRIBUTION, MICRO + EFFECT, DOSE + EFFECT, MASS + HOUR + *THYMIDINE

064746
BERRY RJ + OLIVER R + REISKIN AB
REPRODUCTIVE DEATH OF MAMMALIAN CELLS DUE TO BETA-RADIATION FROM INCORPD THYMIDINE LABELED WITH H-3 OR C-14 (T2333)
RADIOBIOLOGY AND PHYSICS LABORATORIES, RADIOTHERAPY DEPARTMENT, CHURCHILL HOSPITAL, OXFORD, ENGLAND
6 PAGES, 2 FIGURES, 2 TABLES, 12 REFERENCES, HEALTH PHYSICS, VOL. 12, PP. 1461-1466 (1966)

CF NSIC NOS. 49714, 58835, 64735, 64739, 64740, 64741. AUTHORS HAVE ATTEMPTED TO (1) CORRELATE TOXICITY WITH SPECIFIC ACTIVITY, (2) COMPARE RELATIVE TOXICITY OF THYMIDINE LABELED WITH H3 AND OF THYMIDINE LABELED WITH C14 USING CLONAL CELL CULTURE TECHNIQUE OF PUCK, J EXP MED 103, 273 (1956) AND A HUMAN CARCINOMA-DERIVED CELL LINE HELA S-3(OXF) GROWN IN MEDIUM 199 (GLAXO) SUPPLEMENTED WITH 10% HUMAN AB SERUM BUT HAVING NO ADDED THYMIDINE, FULL REPRODUCTIVE INTEGRITY OF A CELL IF IT FORMED A COLONY OF 50 OR MORE CELLS IN 14 DAYS, 200 COLONIES/DISH. THE AVERAGE H3 BETA (5.5 KEV) HAS A RANGE OF ABOUT 1 U IN UNIT DENSITY MATERIAL, DISSIPATION IN A SPHERE (1 U DIAMETER) OF WHICH CORRESPONDS TO 170 RADS. AUTHORS CONCLUDE FROM THEIR STUDY THAT FOR A GIVEN ACTIVITY INCORPD INTO THE NUCLEUS, H3 OR C14 INCORPORATED INTO DNA IS EQUALLY DAMAGING. AT 0.5 UCI/ML CONCN AND SP ACT 0.036 MCI/UM 70% SURVIVAL, WHILE AT 0.05 UCI/ML FOR 0.15, 2.0, 15.0 MCI/UM SURVIVALS WERE 9% AND ESSENTIALLY 0 AND 0. IN-VIVO MUTAGENIC EFFECTS NOT DEMONSTRABLE BY IN-VITRO CELL CULTURE. AUTHORS SUGGEST THAT FROM A HEALTH PHYSICS VIEWPOINT H3-THYMIDINE SHOULD BE REGARDED AS OF MODERATELY HIGH TOXICITY COMPARABLE IN HAZARD TO, SAY, RADIOIODINE.

CARBON + HAZARD, RELATIVE + CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TOXICITY + SPECIFIC ACTIVITY + CELL + CELL, NUCLEUS + CULTURE + MAN + RBE + TUMOR + IN VITRO + EFFECT, DOSE + EFFECT, MASS + THYMIDINE

064747
RUNINI JR + CRONKITE EP + FLIEDNER TM
METABOLISM AND FATE OF TRITIATED THYMIDINE IN MAN (T7585)
10 PAGES, 7 FIGURES, 1 TABLE, 25 REFERENCES, JOURNAL OF CLINICAL INVESTIGATION, VOL. 39, PP. 909-918 (1960)

AVAILABILITY TIME OF INJECTED THYMINE-6H3-DEOXYRIBOSIDE (A) IS SHORT, PLASMA H3 MAX WITHIN 1 MIN AND THEN DECLINING PRECIPITOUSLY, BONE MARROW H3 UPTAKE WITHIN 1 MIN, MOST INCORP IN 1ST 10-15 MIN, ESSENTIALLY COMPLETE IN 60 MIN, AFTER WHICH H3 PLASMA ACTIVITY DUE TO THYMIDILIC ACID, B-OH-AMINOISOBUTYRIC ACID (B) AND OTHER DEGRADATION PRODUCTS OF (A). AT LEAST 50% OF INJECTED (A) RETAINED IN-VIVO AND PRESUMABLY INTO NEW DNA OF PROLIFERATING CELLS, AT LEAST 25% OF (A) DEGRADED TO HTO, WITH (B) THE MAJOR COMPONENT OF URINE NONVOLATILE H3, EVEN IN THE 1ST URINE SAMPLES. BIOL HALF-LIFE OF THE HTO FORMED WAS FROM 7 TO 12 DAYS. IN CALCULATING MAX (A) DEGRADED TO HTO, THE URINE OR PLASMA WITH HIGHEST HTO WAS TAKEN TO BE REPRESENTATIVE OF TOTAL BODY WATER (TBW) AT THAT TIME, TBW TAKEN TO BE 52% IN NORMAL MAN. NON-VOLATILE H3 TAKEN AS DIFF BETWEEN TOTAL H3 AND HTO OF PLASMA. 90% OF INJECTED ACTIVITY LOST FROM BLOOD IN 1ST MIN. BOTH PATIENTS DIAGNOSED AS GLIOBLASTOMA MULTIFORME, A 44-YR-OLD MACHINIST, COMATOSE MAN DECEREBRATE AFTER CRANIOTOMY SURVIVING 6 MONTHS, AND A 65-YR-OLD SURVIVING 4 MONTHS, GIVEN SP ACT 0.2 TO 2 CI/MM, 1ST MAN 5 INJECTIONS OF 10 MCI EACH AND 1 OF 20, THE 2ND MAN SINGLE INJECTION OF 8 MCI (0.1-0.3 UCI/GM).

BIOMEDICAL + WATER + AUTORADIOGRAPHY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + *PHYSIOLOGY/METABOLISM + BONE, MARROW + EXCRETION, URINE + EXPOSURE, IV + MAN + MATURE + MALE + TC PATHOLOGICAL + RETENTION FUNCTION + BLOOD, PLASMA + BODY FLUID + HOUR + THYMIDINE + WEEK

064748
RUBINI JR + KELLER S + WOOD L + CRONKITE EP
INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (T2243)
4 PAGES, PROCEEDINGS OF THE SOCIETY OF EXPERIMENTAL BIOLOGY AND MEDICINE, VOL. 106, PP. 49-52 (1961)

GOOD METABOLIC DATA BASED ON INGESTION ARE SCARCE. THIS PAPER SUPPLIES MINIMAL DATA, CONCNS GIVEN IN CPM/MG DRY WT INSTEAD OF UCI OR DPM, 2 GUINEA PIGS AT 2 HR, 2 RATS AT 3 AND 2 AT 6 FOR BODY-

064748 *CONTINUED*
FLUID MEASUREMENT AND 1 MOUSE AT 8 HR FOR MARROW, TESTIS, ILEUM 5-WK AUTORADIOGRAPHY, USING 100 UCI BY INTUBATION. % H3-THYMIDINE (SP ACT 2 CI/MM) DEGRADED TO HTO IN RAT AND GP WAS 8 TO 17% AND THE % URINARY NONVOLATILE ACTIVITY WAS 0.23 TO 0.41%, THE NONVOLATILE ORGAN DISTRIB BEING (IN CPM/MG DRY WT) SPLEEN 44, LIVER 28, MARROW 28, KIDNEY 15, ILIUM 11, ILIOPSOAS 5 AND 442 IN STOMACH CONTENTS. HEAVIEST AUTORADIOGRAPHIC LABELING SEEN IN MUCOSA OF SMALL INTESTINE. FOR ADDNL DATA ON INCORPORATION OF H3 FROM THYMIDINE INTO DNA SEE NSIC NOS. 64746, 64745, 64743. OF THAT INGESTED H3-THYMINE (OR THYMINE) WHICH REACHES THE BLOOD, PRESUMABLY NOT MORE THAN 10% GETS INCORPORATED INTO MOUSE DNA, NSIC NO. 64738. 2% OF INGESTED THYMIDINE MAY CROSS RAT GUT WALL INTO BLOODSTREAM, NSIC NO. 49587, AT LEAST 50% OF WHICH MAY BE RETAINED BY THE BODY, NSIC NO. 64747, OF WHICH A MJAOR PART CONCENTRATES IN THE NUCLEUS OF DNA-SYNTHESIZING OR DNA-REPAIRING CELLS, NSIC NOS. 64744, 64726.

*INGESTION + AUTORADIOGRAPHY + CRITICAL MASS + ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + MAMMAL, SMALL + BONE, MARROW + MODEL, BIOLOGICAL + MAMMAL, MOUSE + MAMMAL, RAT + GI TRACT + KIDNEY + LIVER + MATURE + MUSCLE + INTESTINE, SMALL + SPLEEN + STOMACH + MALE + BODY FLUID + HOUR + THYMIDINE

064749
GUILD WR
HAZARDS FROM ISOTOPIC TRACERS (T2297)
1 PAGE, SCIENCE, VOL 128, P. 1308 (1958)

DATA ARE ABSENT OR SCARCE FOR SPECIALIZED METABOLITES ACCIDENTLY OR DELIBERATELY INTRODUCED INTO THE BODY, REQUIRING CAUTION THEREFORE. FOR EXAMPLE, TRITIATED THYMIDINE HAS BEEN A GROWING FAVORITE AMONG BIOMEDICAL WORKERS. THE HUMAN BODY CONTAINS 5(TO 100 GM OF DNA (CF NSIC NO. 64744) OR 1000 TIMES LESS DNA THAN IT DOES H2O. WHERE THE BIOL HALF-LIFE OF HTO IS ONLY 19 DAYS OR SO, THAT FOR DNA MAY BE BETWEEN 6 MONTHS AND SEVERAL YRS. 10 MCI OF HTO IN THE BODY, OR 200 UCI/L OF DRINKING WATER, UNIFORMLY DISTRIBUTED THROUGHOUT THE 50 LITERS OF STANDARD MAN (NBS HANDBOOK NO. 57 (1953)) WOULD DELIVER 300 MREM/WK. THE INTEGRAL DOSE FROM A SINGLE INTAKE OF 1 CURIE WOULD DELIVER A TOTAL DOSE OF 100 REM, ON WHICH BASIS USAEC ALLOWS SALE OF 250 UCI OF TRITIUM WITHOUT SPECIFIC LICENSE, ALL OF WHICH DRUNK IN FORM OF WATER WOULD DELIVER 20 TO 35 MREM, A REASONABLE RISK FOR BIOMEDICAL INVESTIGATORS. BUT ONE IS ALLOWED ALSO TO BUY 250 UCI OF TRITIATED THYMIDINE WITHOUT SPECIFIC LICENSE. IF ALL THE RADIATION FROM 250 UCI OF TRITIATED THYMIDINE COULD BE IN THE DNA, GENE MATERIAL COULD RECEIVE A DOSE 10,000 TO 100,000 GREATER THAN THAT FROM AN EQUAL QUANTITY OF TRITIATED WATER. ONLY A SMALL FRACTION OF CELLS ARE ACTIVELY SYNTHESIZING DNA, AND IF THEY PICKED UP MOST OF THE TRITIUM, DOSE COULD BE FURTHER INCREASED. CF NSIC NO. 64752.

BIOMEDICAL + CODES AND STANDARDS + OXIDE + HAZARD, RELATIVE + WATER + DOSE CALCULATION, INTERNAL + ICRP + PERSONNEL EXPOSURE, RADIATION + CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + *DNA + MAN + AGENCY, AEC + DISTRIBUTION, MICRO + THYMIDINE

064750
MOFFAT GH + PELC SR
DELAY AFTER PLUCKING OF HAIRS BETWEEN THE APPEARANCE OF H3-THYMIDINE IN CELLS AND ITS INCORP INTO DNA (T1858A)
STRAGEWAYS RESEARCH LABORATORY, CAMBRIDGE + KINGS COLLEGE, LONDON, ENGLAND
7 PAGES, 3 FIGURES, 2 TABLES, 42 REFERENCES, EXPERIMENTAL CELL RESEARCH, VOL. 42, PP. 460-466 (1966)

EXISTENCE, SIZE AND KINETICS OF A THYMIDINE POOL WOULD BE OF VALUE IN SETTING UP A METABOLIC MODEL FOR THYMIDINE AND RELATED NUCLEOSIDES, SUCH AS NSIC NO. 64745, NOT ONLY FOR MICRO-BUT FOR MACRO-DOSIMETRY AS WELL. A BIOL HALF-LIFE OF 190 DAYS FOR DNA-THYMIDINE, NSIC NO. 64749, COULD BE UNREALISTIC FOR RAPIDLY PROLIFERATING CELLS WHICH DILUTE THE DNA-THYMIDINE RAPIDLY, OR FOR GROWING CELLS THAT WILL NOT SUBSEQUENTLY DIVIDE FOR THE LIFETIME OF THE ANIMAL, UNLESS LABELING CAN OCCUR IN ABSENCE OF MITOSIS OR MEIOSIS, NSIC NO. 64744. IN HISTOLOGICAL PROCEDURES USING WATER, WATER-SOLUBLE H3-THYMIDINE (A) IS WASHED AWAY LEAVING ONLY FIXED TRITIUM. RUBINI, NSIC NO. 64747, FOUND THAT (A) NOT INCORPD INTO DNA IS IMMEDIATELY DEGRADED BY LIVER, DIVIDING CELLS IN S-PHASE INCORPORATING THE (A) INTO DNA. BUT BRYANT, ROBINSON, BREGHER, DIDERHOLM, AND OTHERS HAVE REPORTED DELAYED LABELING, ATTRIBUTED TO REUTILIZATION OF DNA OR OF (A) FROM DYING TISSUE. PRESENT AUTHORS FOUND THAT (A) INJECTED SECONDS AFTER PLUCKING HAIRS DELAYED (A) UPTAKE BY HAIR BULB CELLS FOR 16 TO 32 HR, AFTER WHICH LABELING RESUMED, SUGGESTING (1) DNA SYNTHESIS BLOCK INDUCED BY PLUCKING, (2) H3-THYMIDINE POOL STILL EXISTING AFTER 16-32 HR.

AUTORADIOGRAPHY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *COMPARTMENT + CELL + CELL, NUCLEUS + MODEL, BIOLOGICAL + MAMMAL, MOUSE + EXPOSURE, IP + HAIR + MATURE + *NUCLEOTIDE + SKIN + MALE + DAY + *THYMIDINE + METABOLIC KINETICS

064751
CRANE WA + LOOMES RS
EFFECT OF AGE, SEX, HORMONAL STATE ON TRITIATED THYMIDINE UPTAKE BY RAT PITUITARY (T4647)
UNIVERSITY OF SHEFFIELD, ENGLAND
1 PAGE, BRITISH JOURNAL OF CANCER, VOL. 21, P. 787 (1967)

A GOOD METABOLIC MODEL SHOULD TAKE INTO ACCOUNT PHYSIOLOGIC AND PATHOLOGIC VARIATIONS FROM THE NORM, INCLUDING AGE AND SEX EFFECTS. AMERSHAM THYMIDINE-H3 (0.7 UCI/GM OF FINAL BODY WT), 10 AM-2 PM LABELING TIME (4 HRS), 6 WK EXPOSURE OF 5 U SECTIONS, KODAK AR10 PLATES, 4 DEG C, PITUITARY NUCLEI COUNTED AT 1000 X AND RADIOACTIVE NUCLEI/100 PITUITARY NUCLEI COUNTED. AVERAGE OF 6 RATS PER AGE BRACKET AS FOLLOWS - BODY WT, RADIOACTIVE NUCLEI PER 100 PITUITARY NUCLEI - 57, 0.51 - 113, 0.48 - 212, 0.27 - 349, 0.21 - SHOWING A DEFINITE AGE EFFECT. FIGURES BROKEN DOWN INTO POSTERIOR, INTERMEDIATE, LATERAL ANTERIOR, MEDIAL ANTERIOR LOBES WITH VARIABILITY. YOUNG FEMALES, 50 GM, HAD HIGHEST INCIDENCE OF NUCLEAR LABELING. FEMALES IN ESTRUS SHOWED PRONOUNCED

064751 *CONTINUED*
RISE. TABULATED DATA. LOW LABEL INDEX OF 0.18 FOR MATURE 350 GM MALES (1.8 LABELED NUCLEI/1000 IN THE DNA-SYNTHETIC (S) PHASE), AND FOR YOUNG 50 GM MALES 6.3, WITH 50 GM FEMALES AT 12.8 FOR ANTERIOR LOBE. ESTRUS CYCLE HAS RHYTHMIC EFFECT ON H3-THYMIDINE LABELING OF ANTERIOR PITUITARY NUCLEI. IN AGREEMENT WITH HUNT (1967), ELIMINATED BY OOPHORECTOMY, INCREASED BY ADRENALECTOMY. UPTAKES VARYING BY MORE THAN A FACTOR OF 3 BECOME DOSIMETRICALLY SIGNIFICANT.

AUTORADIOGRAPHY + *RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *PITUITARY + *EFFECT, AGE + CELL + *CELL, NUCLEUS + MAMMAL, RAT + EXPOSURE, IP + IMMATURE + MATURE + FEMALE + MALE + VARIABILITY + DISTRIBUTION, MICRO + *EFFECT, SEX + HOUR + STEROID + THYMIDINE

064752
WULFF VJ + QUASTLER H + SHERMAN FG + SAMIS HV
EFFECT OF SPECIFIC ACTIVITY OF H3-CYTIDINE ON ITS INCORP INTO TISSUES OF YOUNG AND OLD MICE (T2675)
7 PAGES, 3 FIGURES, 4 TABLES, 9 REFERENCES, JOURNAL OF GERONTOLOGY, VOL. 20, PP. 34-40 (1965)

POTENTIAL SIGNIFICANCE OF TRITIUM GOES BEYOND THAT OF TRITIATED WATER AND TRITIATED THYMIDINE. ATTEMPTS TO EVALUATE HEALTH HAZARD ARE DEPENDENT ON EXPTL DATA DESIGNED FOR SAME. H3-CYTIDINE (A) UPTAKE BY RNA IS GREATER IN OLD THAN IN YOUNG MOUSE AND RAT, WULFF, ARCH BIOCHEM 95, 548 (1961). (A) IS INCORPORATED INTO RNA AS CMP (PROBABLY VIA CTP), SLOPE OF INCORPORATION (CONCN VS SPECIFIC ACTIVITY) DECREASING WITH INCREASING AMT OF INJECTED CYTIDINE, DOSE BEING 7 UCI/GM OF BODY WT FOR SPECIFIC ACTIVITIES OF 1.4, 0.14, 0.014, 0.0014 CI/MM. (A) INCORPORTATED MORE RAPIDLY INTO OLD (600-DAY-OLD) SKELETAL MUSCLE THAN YOUNG (60-DAY-OLD), BUT JUST THE REVERSE FOR CNS TISSUE. AGE EFFECT DIMINISHED WITH INCREASING MASS OF CYTIDINE. ANIMALS SACRIFICED 4 TO 6 HRS POSTINJECTION. BLOOD RADIOACTIVITY 2 TO 3 X GREATER FOR DILUTED THAN FOR CONCD LABEL, FOR EXAMPLE ABOUT 4.7 CPM X 10 (EXP -5)/ML AT 1 HR AND 3.1 AT 2 HR FOR 0.004 CI/MM BUT 1.1 AND 1.1 AT 1 AND 2 HR RESPECTIVELY FOR 4 CI/MM FROM A HIGH OF 7 IN 1ST FEW MINUTES FOR 0.004 CI/MM AND A HIGH OF 3 IN 1ST FEW MINUTES FOR 4 CI/MM. GRAIN COUNTS FOR CELL NUCLEI OF KEYWORD ORGANS TABULATED AND GRAPHED. EMULSION EXPOSURE TIME FROM 5 DAYS FOR LIVER TO 85 DAYS FOR CEREBELLUM AND SPINAL CORD. NO PATHOLOGY OBSERVED.

*AUTORADIOGRAPHY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + TOXICITY + *DISTRIBUTION + BLOOD + *SPECIFIC ACTIVITY + *EFFECT, AGE + CELL + CELL, NUCLEUS + MAMMAL, MOUSE + CNS + EXPOSURE, IP + KIDNEY + LIVER + MATURE + MUSCLE + NUCLEOTIDE + FEMALE + MALE + ORGANIC + PATHOLOGY + DISTRIBUTION, MICRO + *EFFECT, MASS + HOUR

064753
JOHNSON HA
DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)
BROOKHAVEN NATIONAL LABORATORY, NEW YORK
9 PAGES, 18 REFERENCES, PP. 315-323 OF THE PROCEEDINGS OF THE SYMPOSIUM ON MEDICAL RADIONUCLIDES - RADIATION DOSE AND EFFECTS, OAK RIDGE, TENNESSEE, DECEMBER 8-11, 1969

10% OF INJECTED H3-THYMIDINE (A) CONCENTRATES IN NUCLEI OF THOSE FEW CELLS SYNTHESIZING DNA AT TIME OF INJECTION, WHICH WOULD IMPLY VERY LARGE DOSE RATES TO GENETIC MATERIAL. FOR MOST OF THE CELL CYCLE, 5 PG OF DNA IS EVENLY DISPERSED OVER 250 PG OF NUCLEOPLASM SO THAT MOST OF THE ENERGY IS ABSORBED BY OTHER THAN DNA AND SOME IS ABSORBED BY CYTOPLASM. 70% OF BODY WATER IS INTRACELLULAR, OF WHICH 10% IS INTRANUCLEAR, SO DOSE RATE TO GENETIC MATERIAL FROM (A) IS PROBABLY NOT MORE THAN 15 TIMES GREATER THAN FROM EQUAL ACTIVITY OF HTO (CF NSIC NOS. 64735, 64749). BOND, NSIC NO. 49714, CALCD ABSORBED DOSE FOR RAT MARROW CELL NUCLEI FROM 1 UCI OF INJECTED (A) PER GM OF BODY WT, AVERAGE ACTIVITY PER NUCLEUS 1.2 DIS/HR AT 1 HR POSTINJECTION, AVERAGE BETA ENERGY 5.7 KEV, AVERAGE NUCLEAR DIAMETER 8 U OR A MASS OF 270 PG, MAX RANGE OF THE BETA IN WATER 6 U, ABOUT 20% OF TOTAL ENERGY ESCAPING FROM NUCLEUS BECAUSE OF SO-CALLED EDGE EFFECT, TO GIVE AN AVERAGE DOSE OF 8 RADS/DAY. PARADOXICALLY, MOST HEAVILY IRRADIATED CELLS ARE THOSE INCORPORATING LEAST (A) BECAUSE THEY HAVE LOWEST TURNOVER AND THEREFORE HIGHEST ACCUMULATED DOSE, 99% OF LABELED DNA BEING LOST IN 2 MONTHS FROM ACTIVE CELLS.

*OXIDE + *HAZARD, RELATIVE + *DOSE CALCULATION, INTERNAL + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TOXICITY + DNA + CELL + *CELL, NUCLEUS + MODEL, BIOLOGICAL + MAMMAL, RAT + EXPOSURE, IV + PATHOLOGY + DISTRIBUTION, MICRO + *THYMIDINE

064754
LEBLOND CP + WALKER BE
RENEWAL OF CELL POPULATIONS (T2693)
22 PAGES, 4 FIGURES, 1 TABLE, 185 REFERENCES, PHYSIOLOGICAL REVIEWS, VOL. 36, PP. 255-276 (1956)

THE LONGER A NON-DIVIDING CELL LIVES THE GREATER THE DOSE ITS GENE MATERIAL RECEIVES FROM DNA-INCORPD H3-THYMIDINE (A) BARRING EXTENSIVE NON-MITOTIC ELIMINATION OF (A) BY MECHANISMS SUCH AS EXCISION/REPAIR OF DNA, AND THE GREATER THE PROBABILITY OF INCREASED GENETIC NOISE SUCH AS MALIGNANCY. AN IMPORTANT HAZARD EVALUATION PARAMETER IS RATE AT WHICH CELL TYPES ARE ELIMINATED FROM THE BODY. IF RAT DATA APPLY TO MAN, MASS OF CELLS RELEASED DAILY FROM SURFACE EPITHELIA INTO GI TRACT SHOULD BE ABOUT 1/2 LB, WITH EQUAL REPLACEMENT IN STEADY STATE FOR ADULT. TURNOVER TIME OF A CELL POPULATION IS TIME TAKEN FOR REPLACEMENT OF A NUMBER OF CELLS EQUAL TO THAT IN THE WHOLE CELL POPULATION, USUALLY ESTIMATED ON BASIS OF MITOTIC INDEX OF THE POPULATION, RATIO OF NO. OF CELLS UNDERGOING MITOSIS AT ANY ONE TIME DIVIDED BY TOTAL NO. CELLS, TURNOVER TIME BEING MITOTIC DURATION DIVIDED BY MITOTIC INDEX. TURNOVER TIME IN DAYS FOR EPIDERMIS (MALPHIGIAN ZONE OF ABDOMEN), ERYTHROCYTES, (GRANULOCYTES + LYMPHOCYTES) OF MAN ARE RESPECTIVELY 100, 120, 12.8 ADDNL ORGANS AND SPECIES TABULATED. DAILY MITOTIC ACTIVITY IN A TISSUE GREATER THAN 1.5% TAKEN AS A SIGN OF RENEWAL. IN MAN EVERY 120 D 2 X 10 (EXP +13) CELLS DIVIDE IN BONE MARROW TO RENEW STOCK OF ERYTHROCYTES. ASSUMING 0.5 HR MITOTIC DURATION, 4 X 10 (EXP +9) MITOSES OCCUR IN MARROW AT ANY MOMENT.

064754 *CONTINUED*
DIETARY HABIT + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + BLOOD + *TURNOVER RATE + DNA + MAMMAL, SMALL + MAMMAL, DOG + BONE, MARROW + *CELL + CELL, ENDOTHELIAL + CELL, EPITHELIAL + CELL, NUCLEUS + MAMMAL, MOUSE + MAMMAL, RAT + INTESTINE, LARGE + LUNG + LYMPH NODE + MAN + *MITOSIS + MOUTH + SKIN + INTESTINE, SMALL + STOMACH + TESTIS + BLOOD, RBC + DISTRIBUTION, MICRO + THYMIDINE + TRACHEA

064755
POST J + HOFFMAN J
SOME EFFECTS OF TRITIATED THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)
THE RESEARCH SERVICE, THIRD (NEW YORK UNIVERSITY) MEDICAL DIVISION, GOLDWATER MEMORIAL HOSPITAL, WELFARE ISLAND, NEW YORK, NEW YORK
7 PAGES, 32 REFERENCES, 2 TABLES, RADIATION RESEARCH, 14, PAGE 713-720, 1961, (T2297)

WITHIN 1 DAY OF 2 UCI/GM INJECTION (SP ACT 0.36 CI/MM, SCHWARZ, LABEL POSITION UNSPECIFIED) DETECTABLE INCREASE IN % TETRAPLOID CELLS OF 3-WK-OLD RAT LIVER, PLOIDY DISTRIB IN 2 WK EQUIV TO THAT BY NORMAL AGING OVER 2 YR, AND YET ONLY 3% OF LIVER CELLS HAD INCORPD H3-THYMIDINE INTO THEIR DNA, WITH NON-DNA H3 IN LIVER REMAINING ONLY 5 HR POSTINJECTION (NSIC NO. 64756). THE 3-WK RATS (50-65 GM) WERE GIVEN 100 UCI CONTAINING 67 UG OF THYMIDINE AND SERIALLY SACRIFICED AT 1,5,14,28,56 DAYS. CONTROL GROUP SHIFTED FROM PREDOMINANTLY DIPLOID NUCLEAR POPULATION AT 3 WK OF AGE TO AN EVENLY DIVIDED DIPLOID/TETRAPOLID POPULATION BY 5 WK OF AGE, TETRAPLOID PREDOMINANT BY 7 WK, FREQUENCY DISTRIBUTION THEN CONSTANT UNTIL 104 WK EXCEPT FOR STEADILY DECLINING DIPLOID CLASS AT WHICH TIME OCTAPLOID CLASS BECAME 17%, EXCEEDING DIPLOID. WITH H3-THYMIDINE GROUP DIPLOID/TETRAPLOID EVENLY DIVIDED WITHIN 1 DAY, TETRA PREDOMINANT AT 5 DA WITH 7% OCTA. BY 14 DAYS FURTHER DECLINE IN DIPLOIDS, OCTAPLOIDS BEING 18.5%, STABILIZED 4 TO 8 WK LATER. AT 5 WK OF AGE, 14 DA POSTEXPOSURE, THE PLOIDY CLASSES WERE SIMILAR TO THOSE FOUND IN LIVERS OF 104-WK-OLD CONTROLS. NUCLEAR LABELING AT 2,6,24 HR POSTADMIN WAS 1.4,1.5,1.3% RESP FOR 10000 NUCLEI IN EACH OF 2 RATS. NSIC NO. 64741 RESULTS CONFIRMED.

AUTORADIOGRAPHY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TOXICITY + DNA + *HISTOPATHOLOGY + *EFFECT, AGE + CELL + *CELL, NUCLEUS + MAMMAL, RAT + EXPOSURE, IP + LIVER + MITOSIS + EFFECT, DOSE + THYMIDINE

064756
STEEL GG + LAMERTON LF
TURNOVER OF TRITIUM FROM THYMIDINE IN TISSUES OF RAT (T0073)
PHYSICS DEPARTMENT, INSTITUTE OF CANCER RESEARCH, ROYAL CANCER HOSPITAL, BELMONT SURREY, ENGLAND
14 PAGES, 24 REFERENCES, 3 TABLES, 8 FIGURES, EXPERIMENTAL CELL RESEARCH, 37, PAGE 117-131, (1965), T0073

H3-THYMIDINE (A) DOES NOT MIX HOMOGENEOUSLY WITH THE INTRACELLULAR THYMIDINE POOL AND ITS INCORP INTO DNA IS NOT AS ACCURATE A MEASURE OF OVERALL DNA SYNTHESIS AS C14-FORMATE OR SERINE, ACCORDING TO WINCHELL, J NUCL MED 10, 624 (1969). (A) IS REUTILIZED IN AMOUNT OF 3% OF ITS DE-NOVO SYNTHESIS IN MOUSE, ZH OBSCHEI BIOL 28, 335 (1967). ACCORDING TO STEEL, ALL BUT A FEW % OF H3 FROM (A) INJECTED IN RAT APPEARS WITHIN 1 HR EITHER IN DNA OR IN HTO EQUILIBRATING WITH TOTAL BODY WATER. IN EXPT (1) RATS WERE GIVEN 1.0 UCI/GM OF BODY WT, 0.36 CI/MM, SCHWARTZ, AND IN EXPT (2) 0.5 OF SP ACT 10. CONCNS IN UCI/GM VS TIME FROM 0 TO 56 DAYS GRAPHED FOR KEYWORD ORGANS, TO WHICH DESIRED FUNCTIONS CAN BE FITTED, DURING WHICH TIME BODY WT DOUBLED FROM INITIAL WT OF 100 TO 120 GM FOR THE 6-8 WK-OLD RATS. ORGAN WTS FOR 100 GM RATS WERE FOR TESTES (2), SPLEEN, THYMUS, LUNG, BONE MARROW 1.40, 0.52, 0.36, 0.73, 1.1 GM RESP, % INCREASE IN 200 GM RATS BEING 180, 108, 98, 160, 136 RESPECTIVELY. PEAK UPTAKES IN UCI/GM FOR SMALL INT, COLON, GLANDULAR STOMACH, BONE MARROW, SPLEEN, THYMUS, TESTIS, LUNG WERE RESP 1,0.8,0.2,1,0.6,0.15,0.03,0.07, WITH RESP HALF-TIMES OF 0.8, 1.8, 3.8, 1.5,2,3,10,3 DAYS, VALUES NORMALIZED TO (2).

RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + CONCENTRATION + DISTRIBUTION + *TURNOVER RATE + BONE, MARROW + MAMMAL, RAT + INTESTINE, LARGE + EXPOSURE, IP + LUNG + MATURE + INTESTINE, SMALL + SPLEEN + STOMACH + TESTIS + MALE + MASS + ORGAN + RETENTION FUNCTION + MONTH + THYMIDINE + THYMUS

064757
GREULICH RC
DELETERIOUS INFLUENCE OF ORALLY ADMINISTERED TRITIATED THYMIDINE ON REPRODUCTIVE CAPACITY OF MICE (T2297)
DEPARTMENT OF ANATOMY, SCHOOL OF MEDICINE, UNIVERSITY OF CALIFORNIA AT LOS ANGELES, LOS ANGELES, CALIFORNIA
12 PAGES, 18 REFERENCES, 2 FIGURES, 3 TABLES, RADIATION RESEARCH, 14, PAGE 83-95, (1961)(T2297)

LITERATURE ON IN-VIVO MAMMALIAN TOXICITY, EXP BY INHALATION OR INGESTION OF THYMIDINE TRITIATED IN A NON-LABILE POSITION, IS SCANTY (CF NSIC NOS. 64755, 64749, 64746). OBSERVATIONS OF GREULICH BASED ON MATINGS OF 7 MICE, AVERAGE WT 28 GM AT START OF EXPT, 2 UCI/ML AD LIB IN DRINKING WATER FOR 32 DAYS, 0.89 CI/MM, DISCONTINUED AFTER BIRTH OF LITTERS, DAILY WATER CONSUMPTION 4 ML/DAY/FEMALE, INCREASING TO JUST OVER 6 AT TERM, FOR A TOTAL ORAL DOSE OF 245 TO 300 UCI OVER 24 TO 32 DAYS, THE MALES USED FOR BREEDING CONSUMING FROM 8 TO 167 UCI FOR PERIODS FROM 1 TO 18 DAYS. STOCK BREEKING RECORDS OF SEVERAL YRS FOR THIS STRAIN (SWISS ALBINO) INDICATE AVERAGE OF SLIGHTLY MORE THAN 9 LIVING ANIMALS PER LITTER FROM RANDOM MATINGS, LOW STILL-BIRTH INCIDENCE. OVER 80 OF 90 NEWBORNS WOULD LIVE TO SEXUAL MATURITY. FIRST MATING GAVE APPARENTLY NORMAL LITERS, BUT ON SUBSEQUENT BREEDING CONTACTS THERE WAS RAPID DECLINE IN REPORDUCTIVE CAPACITY (INCREASED STILLBIRTH, FETAL RESORPTION, MALE STERILITY), WITH HISTOL EVIDENCE OF TESTICULAR DAMAGE AT THE HIGHEST DOSE LEVELS. 3RD BREEDING EXPECTED TO YIELD AT LEAST 36 LIVING YOUNG FROM 4 PAIRINGS GAVE ONLY 8 LIVING AND ALL OF THESE SIRED BY THE MALE WITH LOWEST DOSE, 18 UCI. DAMAGE RANGED FROM EQUIVOCALBE AT 8 TO COMPLETE STERILITY AT 187 UCI.

*INGESTION + *WATER, DRINKING + HAZARDS ANALYSIS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *TOXICITY + *EFFECT, GENETIC + PREGNANT + MAMMAL, MOUSE + DURATION, GENERATION + *EXPOSURE, CHRONIC + FETUS + *INTAKE + *MATURE + NEWBORN + OVARY + TESTIS + UTERUS + FEMALE + *PATHOLOGY +

064757 *CONTINUED*
EFFECT, DOSE + EFFECT, SEX + MONTH + THYMIDINE

064758
GARDER KH + DEVIK F
STUDIES ON INCORP OF TRITIATED THYMIDINE IN DNA OF MOUSE TISSUES AND ON ITS RADIATION EFFECTS (T2297)
HEALTH PHYSICS DEPARTMENT, INSTITUT FOR ATOMENERGI, KJELLER PR. LILLESTROM, NORWAY, + MEDICAL SECTION, STATENS RADIOLOGISK-FYSISKE LABORATORIUM, MONTEBELLO, OSLO, NORWAY
15 PAGES, 22 REFERENCES, 7 FIGURES, 5 TABLES, INT. J. RAD. BIOL., 6 PAGE 157-172, 1963 (T2297)

BASERGA, NSIC NO. 64735, FOUND SHORTENING OF MOUSE LIFE SPAN AT 10 AND 1 BUT NOT 0.1 UCI OF H3-THYMIDINE (1) PER GM OF BODY WT, BUT TUMOR VS DOSE RELATION WAS EQUIVOCABLE. CRONKITE, NSIC NO. 64759, SUGGESTED THAT (A) IN AMT SUFFICIENT FOR GOOD AUTORADIOGRAPHY, 0.05 TO 0.1 UCI/GM, GAVE NO OBVIOUS EVIDENCE OF RADIATION INJURY, BUT DID NOT RULE OUT MORE SUBTLE EFFECTS. GREULICH, NSIC NO. 64757, FOUND NO APPARENT EFFECT IN MICE FROM 2 UCI/ML IN DRINKING WATER ON 1ST MATING, BUT SUBSEQUENT MATINGS PRODUCED STILLBIRTHS, FETAL RESORPTION, MALE STERILITY. PRESENT AUTHORS RAN A 120-DAY EXPT, USING 200, 20, 5 UCI OF (A) PER MOUSE AND 4 UCI OF C14-THYMIDINE, SP ACT 4.4 CI/MM AND 0.0183 CI/MM RESPECTIVELY, 94 MICE WEIGHING ABOUT 22 GM, WITH AUTORADIOGRAPHY AND DNA EXTRACTION OF 7 TISSUES. PLOTS OF USI/MG TISSUE VS TIME FROM 0 TO 120 DAYS SHOWN TO WHICH DESIRED FUNCTIONS CAN BE FITTED, AND GRAIN NOS/CELL NUCLEUS TABULATED, 120 DAYS TOO SHORT FOR RECORDING MALIGNANCY. AUTHORS INTERPRET THEIR RESULTS TO MEAN THAT CELLULAR DEATH FROM RADIATION OCCURRED AT 200 UCI, AND POSSIBLY AT 20 UCI OR 1 UCI/GM OF BODY WT. (A) INCORP WAS NOT PROP TO MASS, SUGGESTING A THYMIDINE POOL. 90% OF LIVER, KIDNEY ACTIVITY FOUND IN THE DNA, NONE IN RNA. CF NSIC NO. 64726.

CARBON + *DOSE CALCULATION, INTERNAL + AUTORADIOGRAPHY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + *TOXICITY + *DISTRIBUTION + COMPARTMENT + DNA + MAMMAL, MOUSE + EXPOSURE, IP + KIDNEY + LIVER + MATURE + MITOSIS + MUSCLE + RNA + SKIN + SPLEEN + TESTIS + MALE + MASS + ORGAN + *RETENTION FUNCTION + *EFFECT, DOSE + EFFECT, MASS + MONTH + *THYMIDINE

064759
CRONKITE EP + FLIEDNER TM + KILLMANN SA + RUBINI JR
TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (T2297)
BROOKHAVEN NATIONAL LABORATORY, UPTON, LONG ISLAND, NEW YORK
20 PAGES, 44 REFERENCES, 7 FIGURES, 4 TABLES, TRITIUM IN PHYSICAL AND BIOL SCIENCES, 2, PAGE 189-209, 1961, (T2297)

WITH REGARD TO DOSIMETRY, METABOLISM, AND TOXICITY OF H3-THYMIDINE (A) THIS REVIEW LEAVES SOMETHING TO BE DESIRED, A REFLECTION OF THE STATE OF THE ART. INTERPRETATION OF SERIAL AUTORADIOGRAPHIC DATA FOLLOWING FLASH LABELING BY (A) USUALLY ASSUMES (1) H3 LABEL ON (A) DOES NOT EXCHANGE, (2) THYMINE BASE DOES NOT EXCHANGE AFTER INCORP INTO DNA, (3) DNA TURNOVER IS SOLELY RESULT OF MITOSIS AND CELL DEATH, (4) REUTILIZ OF (1) FROM DNA DEGRADATION IS INSIG, (5) REUTILIZ OF LARGE CHUNKS OF DNA IS UNLIKELY IN MOST CELL RENEWAL SYSTEMS, (6) DNA SYNTHESIS IN NORMAL CELLS DESTINES A CELL TO DIVIDE ONCE AGAIN, (7) INITIALLY (A) IS UNIFORMLY DISTRIBUTED THROUGHOUT THE BODY AND IS EITHER PROMPTLY INCORPD INTO DNA OR DEGRADED TO NONLABELING MATERIALS, (8) EFFECTIVE AVAILABILITY TIME OF (A) FOR DNA SYNTHESIS IS SHORT, (9) RADIATION FROM (A) IN DNA DOES NOT PERTURB NORMAL STEADY STATE CELL PROLIF, (10) IN-VITRO LABELING DETERMINES PROLIF POTENTIAL OF NORMAL CELLS, (11) IN-VIVO LABELING AFTER SINGLE I.V. MAKES KINETICS OF PROLIF STUDY POSSIBLE BY DILUTING DNA RADIOACTIVITY THROUGH SUCCESSIVE MITOSES, ETC. TOXICITY PAPERS REVIEWED, AS WELL AS CYTOLOGY, HEMATOLOGY, HISTOPATHOLOGY. CF NSIC NOS. 64758, 64757, 64746 FOR TOXICITY AND 64758, 64753, 64749, 64746, 64740, 64739, 64730, 49714, 49587, 49586 FOR DOSIMETRY.

IAEA + DOSE CALCULATION, INTERNAL + POPULATION EXPOSURE + AUTORADIOGRAPHY + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + CHROMOSOMAL EFFECT + PHYSIOLOGY/METABOLISM + TOXICITY + BLOOD + BONE, MARROW + CELL + MODEL, BIOLOGICAL + MAMMAL, MOUSE + MITOSIS + THYMIDINE

064760
BIANCHI PA + CRATHORN AR + SHOOTER KV
USE OF TRITIUM-LABELED THYMIDINE IN STUDIES ON SYNTHESIS OF DNA
CHESTER BEATTY RESEARCH INSTITUTE, INSTITUTE OF CANCER RESEARCH, LONDON, UNITED KINGDOM
7 PAGES, 10 REFERENCES, 2 FIGURES, 2 TABLES, TRITIUM IN PHYSICAL AND BIOL SCIENCES, 2, PAGE 269-276, 1961 (T2297)

POSTULATE (7) OF NSIC NO. 64759 ASSUMES THAT ANY H3-THYMIDINE (A) NOT PROMPTLY INCORPD INTO DNA IS DEGRADED TO NONLABELING MATERIALS. SEVERAL AUTHORS HAVE SUGGESTED EXISTENCE OF A THYMIDINE POOL, SIZE AND KINETICS UNSPECIFIED (NSIC NOS. 64758, 64756, 64750, 64748, 64747, 64745, 64744, 64742, 49587). GARDER, NSIC NO. 64758, FOUND NO H3 FROM (A) IN RNA BUT MARSH, NSIC NO. 64726, FOUND UP TO 2% AND BRYANT, NSIC NO. 64726, FOUND UP TO 10% OF INJECTED (A) ACTIVITY IN PROTEIN DUE PERHAPS TO TRANSMETHYLASE OR TO SELF-RADIOLYSIS OF SHELF-STORED (A). LACK OF DNA SPECIFICITY BY (A) ALSO SUGGESTED BY FOX, NSIC NO. 64726. SINCE THYMINE CAN REPLACE FOLIC ACID AND THYMIDINE VITAMIN B12, THESE AND OTHER REACTIONS CAN EITHER DILUTE OR CONCENTRATE THE TRITIUM LABEL FROM INGESTED (A) AND TO SOME UNKNOWN DEGREE ALTER DOSIMETRY. 90% OF LIVER AND KIDNEY ACTIVITY WAS FOUND IN DNA, NSIC NO. 64758. 99% OF DNA LABEL IS LOST IN 2 MONTHS FROM ACTIVE CELLS, NSIC NO. 64753. NORMAL RAT URINARY THYMIDINE RANGES FROM 50 TO 200 UG/DAY, NSIC NO. 64742. BIANCHI ET AL CAUTION THAT THYMIDINE PHOSPHATES ARE NOT REMOVED FROM INTACT CELLS BY USUAL AUTORADIOGRAPHIC WASH/FIX TECHNIQUE, WHICH CAN GIVE VALUES TOO HIGH FOR DNA H3 ACTIVITY.

ANALYTICAL TECHNIQUE + PHOSPHATE + *REVIEW + *COMPUTER CONTROL + *RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + *PHYSIOLOGY/METABOLISM + *DNA + CELL + MODEL, BIOLOGICAL + MAMMAL, RAT + NUCLEOTIDE + IN VITRO + THYMIDINE

064761
MYERS DK + RAM S
INCORPORATION OF RADIOACTIVE LABEL FROM PYRIMIDINES INTO LIVER LIPIDS (T7596)
BIOLOGY & HEALTH PHYSICS DIVISION, ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
2 PAGES, CAN. J. PHYSIOL. PHARMACOL, 47, PG. 731-733, 1969

POSTULATE (I) OF NSIC NO. 64759 ASSUMES THAT H3 LABEL ON H3-THYMIDINE (A) DOES NOT EXCHANGE. PRESENT AUTHORS FOUND 3 TIMES AS MUCH TRITIUM IN LIPID FRACTION OF RAT LIVER AS IN NUCLEIC ACID FRACTION, EMPHASIZING NEED FOR EXHAUSTIVE LIPID EXTRACTION IN AUTORADIOGRAPHIC INTERPRETATIONS OF NA SYNTHESIS. HIGHEST LIPID INCORP IN LIVER, WHICH HAS A LOW RATE OF DNA SYNTHESIS AND HIGH RATE OF THYMIDINE DEGRADATION. ORGAN, UCI/GM WET WT, % H3 IN NUCLEIC ACIDS, % H3 IN LIPIDS, % H3 IN ACID-SOLUBLE MATERIALS AS FOLLOWS - LIVER 0.12, 4, 12, 84 - KIDNEY 0.12, 7, 3, 90 - THYMUS 0.15, 43, 2, 54 - SPLEEN 0.21, 70, 1, 29. PROTEIN RESIDUE SHOWED 0.1 TO 0.5% H3 IN ORGANS (CF NSIC NO. 64726). THE 140-160 GM RATS RECEIVED EITHER 20 UCI OF (A) OR 4 UCI OF C14-LABELED THYMINE (B), URACIL (C) OR CYTOSINE (D). THE C14 LABEL EITHER ON 5-CH3 OR ON C-2 OF PYRIMIDINE RING OF (A) ALSO RAPIDLY INCORPD INTO LIVER LIPIDS (BUT NOT SPLEEN), AS WELL AS H3 AND C14 METHYL-LABELED (B), 2-C14-LABELED (B), H3 AND C14 METHYL-LABELED (B), AND 5,6-H3-LABELED (C) AND (D), NONE OF THEM EXCLUSIVELY INCORPD INTO NUCLEIC ACIDS AT 1 HR POSTINJECTION, THE LABEL BEING WIDELY DISTRIBUTED IN TISSUE CONSTITUENTS PRESUMABLY AS RESULT OF COMPLETE BREAKDOWN OF PYRIMIDINE RING IN LIVER.

CARBON + *ANALYTICAL TECHNIQUE + AUTORADIOGRAPHY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOCHEMICAL + PHYSIOLOGY/METABOLISM + CONCENTRATION + DISTRIBUTION + *DNA + MAMMAL, RAT + EXPOSURE, IP + *FAT + KIDNEY + *LIVER + MATURE + NUCLEOTIDE + PROTEIN + SPLEEN + FEMALE + HOUR + PHYSICOCHEMICAL FORM + THYMIDINE + THYMUS

064762
GRIEDER A + ODARTCHENKO N + COTTIER H + CRONKITE EP + SCHINDLER R
SPECIFICITY OF TRITIATED THYMIDINE AS A PRECURSOR OF DNA UNDER CONDITIONS OF PROLONGED ADMINISTRATION (T7590)
SWISS INSTITUTE FOR EXPERIMENTAL CANCER RESEARCH, 1000 LAUSANNE, SWITZERLAND, DEPARTMENT OF PATHOLOGY, UNIVERSITY OF BERN, 3008 BERN, SWITZERLAND + MEDICAL DEPARTMENT, BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
3 PAGES, 12 REFERENCES, 1 TABLE, 1 FIGURE, PROC OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE, PAGE 1026-1029, 1970

CF NSIC NO. 64761. PRESENT AUTHORS SURPRISED TO FIND HIGH ACTIVITY IN DNA OF FAT TISSUE. ACTIVITY IN DIFFERENT BIOCHEMICAL FRACTIONS OF VARIOUS ORGANS AFTER INJECTING 4 MICE OF UNSPECIFIED AGE WITH 90 INJECTIONS AT 8-HR INTERVALS (0.334 UCI/GM BODY WT) FOR TOTAL OF 30 UCI/GM, SP ACT 1.9 CI/MM FROM SCHWARTZ, GAVE FOLLOWING VALUES IN UCI/KG OF WET WT TISSUE FOR DNA, RNA, PROTEIN, LIPIDS, ACID-SOLUBLE MATERIALS RESPECTIVELY - LIVER 331, 70, 108, 140, 1306 - KIDNEY 496, 47, 25, 73, 1688 - SPLEEN 3465, 57, 59, 62, 1306 - BRAIN 34, 32, 15, 60, 1420 - STRIATED MUSCLE 80, 31, 10, 70, 1278 - HEART 101, 31, 12, 76, 1186 - FAT TISSUE 1357, 55, 29, 181, 1030 - SKIN 319, 26, 18, 84, 706 - GI TRACT 2435, 41, 115, 59, 574. THYMIDINE WAS TRITIATED IN THE METHYL POSITION. FRACTIONATION BY METHOD OF SCHMIDT AND THANNHAUSER, JBC 161, 83 (1945) AS MODIFIED BY SCHNEIDER, JBC 164, 747 (1946). RADIOCHEM PURITY CHECK SHOWED SMALL AMT OF THYMINE. 1 HR AFTER 90TH INJECTION NO FREE H3-THYMIDINE DETECTED IN ORGANS. 70% OF LABEL IN ACID-SOLUBLE FRACTION WAS IN TRITIATED WATER. GREATEST DNA SPECIFICITY IN ORGANS WITH HIGHEST CELL PROLIFERATION. 27% OF TOTAL COLD TCA-SOLUBLE RADIOACTIVITY DID NOT EXCHANGE WITH WATER. DIFFUSE LABELING INCREASES WITH TIME. CF NSIC NOS. 64760, 64756.

CHROMATOGRAPHY + ANALYTICAL TECHNIQUE + SOLVENT EXTRACTION PROCESS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOCHEMICAL + PHYSIOLOGY/METABOLISM + CONCENTRATION + *DISTRIBUTION + *DNA + MAMMAL, MOUSE + *EXPOSURE, CHRONIC + EXPOSURE, IP + *FAT + GI TRACT + KIDNEY + LIVER + MUSCLE + PROTEIN + RNA + SKIN + SPLEEN + FEMALE + BRAIN + HEART + THYMIDINE + WEEK

064763
HETENYI G + MAK D
3H-2-GLUCOSE AS TRACER IN TURNOVER STUDIES (T7591)
DEPARTMENT OF PHYSIOLOGY, UNIVERSITY OF TORONTO, TORONTO 181, ONTARIO
2 PAGES, 7 REFERENCES, 1 FIGURE, CANADIAN JOURNAL OF PHYSIOLOGY AND PHARMACOLOGY, 48, PAGE 732-4, 1970, (T7591)

CF NSIC NO. 64762. UBIQUITOUS NATURE OF TRITIUM IN BIOMASSES SUCH AS MAN, ABOVE NATURAL BACKGROUND, MAY OR MAY NOT CONSTITUTE A FUTURE SOMATIC OR GENETIC HAZARD TO BALANCE AGAINST BENEFIT AND NEED FOR MORE POWER. TO DATE, EMPHASIS HAS BEEN ON TRITIATED WATER, LUMINOUS PAINT, AND THYMIDINE. EXOGENOUS LABELED GLUCOSE (G), USED TO STUDY G TURNOVER RATE IN BODY, HAS BEEN ASSUMED NOT TO EXCHANGE ITS LABEL WITH ENDOGENOUS G AN UNTENABLE ASSUMPTION. PRESENT AUTHORS EXAMINED POSSIBILITY OF A NONMETABOLIC TRANSFER OF H3 FROM G TO BODY WATER, WHICH WOULD GIVE ERRONOUSLY HIGH TURNOVER RATE FOR G, USING EVISCERATED-NEPHRECTOMIZED TECHNIQUE (CREUTZFELDT, ACTA ENDOCRINOL 39, 263 (1962)). REICHARD, JBC 238, 495 (1963), PROPOSED G LABELED WITH C14 IN 1-POSITION TO CORRECT FOR ERRORS FROM REINCORPORATION OF TRACER. PRESENT AUTHORS USED 2-H3-G/1-C14-G SPECIFIC ACTIVITY RATIO VS TIME FROM 1 TO 80 MIN, AND FASTED 279-388 GM WOODLYN FARMS RATS. THE RATIO WAS EQUAL TO AND GREATER THAN 1 FOR EVISCERATED, DECREASING FROM 0.9 TO 0.5 FOR NORMAL RATS, TAKEN TO MEAN THAT LABEL FROM 2-H3-G WAS NOT LOST (AS RAPIDLY IN 1ST HR OR TWO AS FROM 1-C14-G) BY NONMETABOLIC MEANS. TURNOVER RATES AT 6.97 UCI/HR OF H3 AND 0.92 UCI/HR OF C14 WERE 5.20-6.26 MG/KG MIN FOR 2-H3-G AND 3.48-4.06 MG/KG MIN FOR 1-C14-G.

BIOMEDICAL + *ANALYTICAL TECHNIQUE + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + *PHYSIOLOGY/METABOLISM + FOOD CHAIN + RADIONUCLIDE TRANSFER + *SPECIFIC ACTIVITY + *TURNOVER RATE + MAMMAL, RAT + EXPOSURE, IV + MATURE + MALE + *ORGANIC + IC GROSSLY NORMAL + IC PATHOLOGICAL + BLOOD, PLASMA + PHYSICOCHEMICAL FORM + METABOLIC KINETICS + FOOD

064764
CLEAVER JE
THYMIDINE METABOLISM - PATHWAYS OF INCORPORATION AND DEGRADATION
LABORATORY OF RADIOBIOLOGY, UNIVERSITY OF CALIFORNIA, SAN FRANCISCO, CALIFORNIA
26 PAGES, 128 REFERENCES, 5 FIGURES, 2 TABLES, THYMIDINE METABOLISM AND CELL KINETICS, CHAPTER 2, PAGE 43-69, 1967 (T2297)

THYMINE (A) COMBINED WITH DEOXYRIBOSE FORMS THYMIDINE (B) WHICH REACTS WITH ATP TO FORM THYMIDINE MONOPHOSPHATE (C), THYMIDINE DIPHOSPHATE (D), AND THYMIDINE TRIPHOSPHATE (E). DNA AND RNA BOTH CONTAIN ADENINE, GUANINE, CYTOSINE, BUT ONLY DNA CONTAINS THYMINE AND RNA URACIL; WITH EXCEPTIONS, THYMINE CONTENT OF RNA NOT MORE THAN 2%, HOLLEY, SCIENCE 147, 1462 (1965), ETC. THE NUCLEOTIDES (C), (D), (E) ARE MORE READILY ABSORBED THAN THE NUCLEOSIDE (B), NSIC NO. 64748, PYRIMIDINE (A), AND (E) MAY BE REQUIRED FOR DNA SYNTHESIS (NSIC NO. 64760). DNA OF SOME POTENTIAL FOODSTUFFS SUCH AS CRABMEAT MAY CONTAIN AS MUCH AS 90% ALTERNATING (C) + ADENYLATE, SKINNER, BIOCHEMISTRY 10, 1864 (1971). ALTERNATE TO THE BIOSYNTHETIC ROUTE (B)/(C)/(D)/(E)/DNA IS BIODEGRADATION (B)/(A) AND THENCE TO B-AMINOISOBUTYRIC ACID, NSIC NO. 64747, AND UNIDENTIFIED ACID-SOLUBLE MATERIALS, NSIC NO. 64762. SOME INCORP OF (B) LABEL INTO RNA VIA RIBOTHYMINE AND INTO PROTEINS VIA TRANSMETHYLATION, NSIC NO. 64726, OR B-ALANINE, OR INTO LIPIDS, NSIC NO. 64762. IN MAN 17% OF INJECTED C14-(B) IS RETAINED IN DNA, 3% EXCRETED AS B-AMINOISOBUTYRIC ACID, 80% AS CO2, KRISS, ATOMLIGHT 47 (1965), BUT RETENTION OF H3-(B) IS GREATER, ONLY 33% DEGRADED TO WATER AND B-AMINOISOBUTYRIC ACID, NSIC NO. 64747.

CARBON + CORRELATION + *REVIEW + ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOCHEMICAL + *PHYSIOLOGY/METABOLISM + FOOD CHAIN + *EXCRETION + DNA + MAMMAL, MOUSE + MAMMAL, RAT + MAN + RETENTION + THYMIDINE

064765
CLEAVER JE
THYMIDINE METABOLISM - THE FOUR-FACTOR MODEL, POOL SIZES AND GROWTH INHIBITION (T7597)
LABORATORY OF RADIOBIOLOGY, UNIVERSITY OF CALIFORNIA, SAN FRANCISCO, CALIFORNIA
33 PAGES, 76 REFERENCES, 11 FIGURES, 4 TABLES, THYMIDINE METABOLISM AND CELL KINETICS, PAGE 70-103, 1967 (T7597)

CF NSIC NOS. 64745, 64764. THE METABOLIC PATHWAYS FOR INCORP AND DEGRADATION OF THYMIDINE (A) CAN BE REPRESENTED BY A SIMPLE MODEL TO INTERPRET KINETICS OF (A) INCORP INTO DNA UNDER DIFF EXPTL CONDITIONS. MODEL BASED ON ASSUMPTION THAT (A) METABOLISM PATHWAYS MEET IN A FREELY MIXING POOL OF ACID-SOLUBLE DERIVS, (A), (A)-MP, (A)-DP, (A)-TP, THE POOL HAVING 2 INPUTS - ENDOGENOUS (A) AND EXOGENOUS (A) SUPPLIED FROM OUTSIDE THE ORGANISM - AND 2 OUTPUTS - DNA SYNTHESIS, (A) DEGRADATION. B1 MOLECULES/MIN INCORPD INTO DNA FROM POOL, B2 MOLECULES/MIN ENTER POOL FROM ENDOGENOUS SYNTHETIC PATHWAYS, B3 THE RATE OF DEGRADATION. FOR CALCNS POOL ASSUMED TO CONSIST MAINLY OF (A)-TP (THYMIDINE TRIPHOSPHATE). RATE OF INCORP OF H3 LABEL INTO DNA DERIVED FROM POOL SPECIFIC ACTIVITY OF EXTERNAL (A) AND B1, SOLVING FOR STEADY STATE. END-PRODUCT INHIBITION EXISTS IN CELL CULTURE ANALYSIS BUT NOT WHOLE ANIMAL. MODEL PREDICTS THAT WITH END-PRODUCT INHIBITION UNDER FLOODING CONDITIONS (EXTERNAL (A) SUPPLYING ALL THE (A)-TP) RATE OF INCORP OF LABEL INTO DNA IS INDEPENDENT OF EXTERNAL (A) CONCN AND PROPORTIONAL TO SP ACT, WHILE UNDER TRACE CONDITIONS INCORP RATE IS PROP TO SP ACT X SQ ROOT OF CONCN. RATE AT WHICH NUCLEOTIDES PASS THROUGH POOL IS 10 (EXP +7) MOLECULES/MIN/CELL. THOUGH LARGE POOL FORMS IN 10 MIN, POOL NOT EXHAUSTED UNTIL 3-4 HR OF GROWTH.

COMPUTER, ANALOG + AUTORADIOGRAPHY + REVIEW + *MATHEMATICAL TREATMENT + *MODEL TESTING + *RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOCHEMICAL + PHYSIOLOGY/METABOLISM + *SPECIFIC ACTIVITY + TURNOVER RATE + DNA + CELL + *MODEL, BIOLOGICAL + MAMMAL, MOUSE + EXPOSURE, IP + MATURE + FEMALE + DISTRIBUTION, MICRO + EFFECT, DOSE + EFFECT, MASS + HOUR + THYMIDINE + *METABOLIC KINETICS

064766
SMITH TE + TAYLOR RT
INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE, BIO-MEDICAL DIVISION
UCRL-50781 +. 24 PAGES, 72 REFERENCES, 4 FIGURES, 1969

QUOTE - BY MAKING ASSUMPTIONS THAT TRITIUM REMAINS ENTIRELY IN BODY WATER UNTIL IT IS ELIMINATED AND THAT ITS REMOVAL FOLLOWS A SINGLE EXPONENTIAL CURVE, THE BIOLOGICAL HALF-LIFE OF TRITIUM IN MAN HAS BEEN ESTIMATED TO BE 8.5 TO 10.5 DAYS (NSIC NOS. 64767, 64768). HOWEVER, THE FALLACY IN THESE ASSUMPTIONS HAS BEEN DEMONSTRATED SEVERAL YEARS EARLIER WITH THE OBSERVATION THAT TRITIUM CONCENTRATIONS IN THE FAT ORGANIC CONSTITUENTS WERE HIGHER THAN THE BODY WATER IN THE CASE OF A MAN WHO, PRIOR TO HIS DEATH, HAD BEEN EXPOSED TO HTO FOR A PERIOD OF 8 MONTHS (NSIC NO. 64728). RECENTLY, JUNGAS CLEARLY DEMONSTRATED IN-VITRO WITH RAT ADIPOSE TISSUE THAT INCORP OF TRITIUM WAS AN EXCELLENT INDEX OF UNSATD FATTY ACID BIOSYNTHESIS (NSIC NO. 64769). UNQUOTE. CF NSIC NO. 64770. THIS BIOCHEMICAL REVIEW DIVIDED INTO 3 PARTS - (1) INTRODUCTION, (2) CONTRIBUTIONS OF GLUCOSE METABOLISM TO TRITIUM RETENTION IN MAMMALIAN SYSTEMS, (3) ONE-CARBON METABOLISM - SPEAKING IN A QUALITATIVE WAY TO THE QUESTION - WHAT IS THE METABOLIC FATE OF TRITIUM IF INGESTED AS HTO AT A CONSTANT LEVEL OVER A PROLONGED TIME-SUGGESTING THAT THE STORAGE COMPARTMENTS FOR TRITIUM ARE CHEMICAL RATHER THAN STRUCTURAL IN NATURE, CITING THOMPSON, JBC 200, 731 (1953), AND SPELLING OUT SOME OF THE CHEMICAL PATHWAYS INVOLVED.

INGESTION + OXIDE + WATER + HAZARDS ANALYSIS + REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOCHEMICAL + *BIOLOGICAL HALF-LIFE + *PHYSIOLOGY/METABOLISM + DNA + MODEL, BIOLOGICAL + MAMMAL, RAT + *EXPOSURE, CHRONIC + *FAT + MAN + PROTEIN + WHOLE BODY + *ORGANIC + BODY FLUID

064769
JUNGAS RL
FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)
9 PAGES, 53 REFERENCES, 3 TABLES, 4 FIGURES, BIOCHEMISTRY, 7, PAGE 3708-3717, 1968 (T7599)

CF NSIC NO. 64766. THOUGH IN-VITRO TISSUE SLICE METABOLISM IS FAR REMOVED FROM INTACT-BODY METABOLISM, STOICHIOMETRICALLY AND OTHERWISE, SUCH BIOCHEMICAL INFORMATION SHOULD BE CONSIDERED IF IT LEADS TO NEW INSIGHT ON TRITIUM HAZARD TO MAN FROM CHRONIC INTAKE. IN-VIVO AND IN-VITRO STUDIES HAVE INDICATED THAT DEUTERATED AND TRITIATED WATER LABELS SHOW UP IN FATTY ACIDS (A) OF VARIOUS TISSUES IN SUBSTANTIAL AMTS. PURPOSE OF PRESENT STUDY TO PERMIT MORE DETAILED PREDICTIONS ON NATURE, MECHANISM AND EXTENT OF LABELING OF (A) AND OF ISOTOPIC MASS EFFECT ON KINETICS, USING HTO, 1 TO 5 MCI, OR UNIFORMLY-LABELED C14-GLUCOSE, 0.7 UCI, WITH ABOUT 150 MG OF TISSUE EACH TIME. H3 INCORP INTO (A) AVERAGED 0.0013 UG-ATOM/100 MG OF FRESH TISSUE IN 2 HR IN THE ABSENCE OF (A) SYNTHESIS, OR 4 ORDERS OF MAGNITUDE LESS THAN IN PRESENCE OF SYNTHESIS. FOR EACH C14 ATOM INCORPD INTO (A), 7/8 OF AN H3 ATOM IS ALSO INCORPD, OR AN AVERAGE OF 14 H3 ATOMS PER (A) MOLECULE, AVERAGE CHAIN LENGTH OF NEWLY SYNTHESIZED (A) BEING 16.0. 1 H3 ATOM ASSOCD WITH EVEN-NUMBERED C ATOMS, 2/3 WITH ODD, ALPHA CARBON 1.00, BETA 0.74, GAMMA 0.96, DELTA 0.70 ATOMS OF H3 PER ATOM OF C14. NO REACTIONS KNOWN WHICH EXCHANGE THE HYDROGENS AT POSITIONS 1 AND 6 OF GLUCOSE. CF NSIC NO. 64763.

CARBON + DEUTERIUM + HYDROGEN + OXIDE + ANALYTICAL TECHNIQUE + ISOTOPIC FRACTIONATION + *RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOCHEMICAL + PHYSIOLOGY/METABOLISM + MAMMAL, RAT + *FAT + OBSERVED RATIO + ORGANIC + *IN VITRO + EFFECT, MASS

064770
HATCH FT + MAZRIMAS JA + GREENWAY GG + KORANDA JJ + MOORE JL
STUDIES ON LIVER DNA IN TRITIATED KANGAROO RATS LIVING AT SEDAN CRATER
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, BIO-MEDICAL DIVISION
URCL-50461 +. 49 REFERENCES, 8 TABLES, 6 FIGURES, JULY 10, 1968, (T1858)

KANGAROO RATS (DIPODOMYS MERRIAMI) TRAPPED IN 1965 WITHIN 200 YARDS OF SEDAN CRATER OF 1962 AT THE NEVADA TEST SITE REENTERED THE CRATER VICINITY ABOUT 1963. WITH A MEAN LIFETIME OF 4 TO 5 MONTHS IN THEIR DESERT ENVIRONMENT, CONSUMING NO FREE WATER, NEARLY ALL OF ITS WATER FROM ITS PRINCIPAL FOOD, SEEDS OF RUSSIAN THISTLE (SALSOLA KALI), + A SMALL AMT OF RESPIRATORY WATER EXCHANGE VIA HUMID AIR IN THE BURROWS, LIVER DNA CONTAINED 6 X 10 (EXP +6) DPM/GM HYDROGEN OR 0.2 UCI/GM OF HYDROGEN IN LIVER AND BODY WATER. FROM 5 X 10 (EXP +5) DIS/MIN/GM LIVER OR 2.3 X 10 (EXP -7) CI/GM AND ASSUMING UNIFORM DISTRIB OF H3, AND THAT 1 CI/GM OF TISSUE DELIVERS 12000 RADS/HR, TISSUE DOSE WAS ESTD TO BE 2.9 MRAD/HR OR 25 RAD/YR. ASSUMING 6 X 10 (EXP -12) GM DNA/CELL, DOSE TO DNA WOULD BE 7 ERG/GM-DAY TIMES 6 X 10 (EXP -12 GM DNA/CELL DIVIDED BY 16 X 10 (EXP -12) ERG/EV OR 26 EV OR ALMOST 1 ION-PAIR/CELL/DAY IN DNA. LIFETIME CHRONIC DOSE TO ADULT (38 GM) RATS ESTIMATED AT 10 RAD FROM H3 INTERNAL BETA + 10 RAD FROM EXTERNAL BETA AND GAMMA EMITTING RADIONUCLIDES (0.5 MRAD/HR FROM HARD BETA + 2 MRAD/HR FROM GAMMA AT BURROW DEPTH) AS PERSISTENT CRATER AREA DOSE. SMALL BUT SIGNIFICANT BIOCHEMICAL AND FUNCTIONAL CHANGES IN DNA COMPARED TO CONTROLS WAS NOTED. CF NSIC NO. 64766.

WATER + DIETARY HABIT + DOSE CALCULATION, INTERNAL + NEVADA TEST SITE + HAZARDS ANALYSIS + *MONITOR, NUCLEAR DETONATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOCHEMICAL + PHYSIOLOGY/METABOLISM + TOXICITY + *RADIATION EFFECT + *DNA + MAMMAL, RAT + DURATION, GENERATION + EXPOSURE, CHRONIC + LIVER + MATURE + *EXPOSURE, BACKGROUND + BODY FLUID

064771
POST J
EFFECTS OF H3-THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)
NEW YORK UNIVERSITY SCHOOL OF MEDICINE, 550 FIRST AVENUE, NEW YORK, NEW YORK + NEW YORK UNIVERSITY RESEARCH SERVICE, GOLDWATER MEMORIAL HOSPITAL
NYO-2778-7 +. 28 PAGES, 12 REFERENCES, 15 FIGURES, 2 TABLES, SEPTEMBER 1, 1969 (T2297)

LARGER THE CONCN AND SMALLER THE VOL IN WHICH TRITIUM CONCENTRATES, THE MORE HAZARDOUS THE SITUATION (PRESUMABLY), WHILE THE MORE DIFFUSE INITIALLY OR WITH TIME, AND THE MORE READILY REPAIRED, THE LESS HAZARDOUS 1ST STEP IN BIOHAZARD EVALUATION BEING QUALITATIVE IDENTIFICATION, 2ND QUANTITATIVE CORRELATION OF PHYSIOLOGIC/PATHOLOGIC EFFECTS WITH DOSE CALCNS, IN CONJUNCTION WITH EPIDEMIOLOGIC STATISTICS. AUTHOR EXAMINED 3 CELL POPULATIONS (SPLEEN, LIVER, ILEUM) WITH H3-THYMIDINE AND WITH AN ANALOG, IODODEOXYURIDINE, USING 21-28 DAY WISTAR RATS, SACRIFICING AT 2,4,24,48 HR, AND FROM DPM/NUCLEUS CALCULATING 75, 140, 800 RADS/DAY TO THE LABELED DNA OF SPLEEN AND 400, 800, 2000 RADS/DAYS TO LIVER DNA FOR 1, 2, 10 UCI/GM OF BODY WT RESPECTIVELY. THE REGULAR POLYCYCLICAL REPLICATION PATTERN OF HEPATOCYTES WAS DISRUPTED AND CELLS ARRESTED IN S AND G2 STAGES BY 10 AND 2 BUT NOT 1 UCI/GM. SPLEEN LYMPHOCYTES SHOWED ASYMMETRIC MITOTIC LABELING CURVE AT 1 UCI/GM AND THUS MORE SENSITIVE THAN LIVER OR ILEUM CELLS, RETAINING THE DISRUPTED CYCLE AFTER LABEL LOSS, UNLIKE LIVER AND ILEUM. H3-IODODEOXYURIDINE EVEN MORE EFFECTIVE THAN H3-THYMIDINE IN DISRUPTING CYCLE PATTERNS. CF NSIC NO. 64758. 1,2,10 UCI/GM GAVE 37,89,357 DISINT/LABELED NUCLEUS/DAY, REPORTED BY MCCARTHY, BIOCHIM BIOPHYS ACTA 166, 249 (1968) AS INDUCING GENOME ALTERATIONS AND CELL DEATH IN B. SUBTILIS.

BIOMEDICAL + *DOSE CALCULATION, INTERNAL + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + TOXICITY + DISTRIBUTION + DNA + *CELL, NUCLEUS + MAMMAL, RAT + EXPOSURE, SC + LIVER + MATURE + MITOSIS + NUCLEOTIDE + INTESTINE, SMALL + SPLEEN + MALE + *EFFECT, DOSE + THYMIDINE

064772
DEWEY WC + HUMPHREY RM + JONES BA
COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (T7605)

064772 *CONTINUED*
DEPARTMENT OF PHYSICS, THE UNIVERSITY OF TEXAS, M.D. ANDERSON HOSPITAL AND TUMOR INSTITUTE, TEXAS MEDICAL CENTER, HUSTON, TEXAS
24 PAGES, 68 REFERENCES, 1 TABLE, 6 FIGURES, RADIATION RESEARCH, 24, PAGE 214-238, 1975

SINCE MACRODOSIMETRY OF TRITIATED WATER (A) IS BETTER DOCUMENTED THAN THAT FOR TRITIATED THYMIDINE (B), INTERCOMPARISON IS IMPORTANT TO MAKE BETTER USE OF THE EXTENSIVE LITERATURE ON (B) AS AN ORGANIC PROTOTYPE IN ASSESSING PAST, PRESENT, AND FUTURE HAZARDS OF TRITIUM IN MAN AND HIS FOOD CHAIN. 2 X 10 (EXP +6) CHINESE HAMSTER CELLS/FLASK IN MCCOY 5A MEDIUM + 10% CALF SERUM, INCUBATED 24 HR AT 37 C IN 6% CO2 AND THEN PULSE-LABELED FOR 1 HR WITH FROM 0.03 TO 20 UCI/ML OF (B), SP ACT 1.9 OR 5.5 CI/MM, WASHED WITH UNLABELED (B), THEN INCUBATED 10 HR AND 50 LABELED METAPHASES/SAMPLE THEN ANALYZED FOR NO. OF GRAINS AND NO. OF CHROMOSOMAL BREAKS AND EXCHANGES. EACH EXCHANGE (CHROMATID OR DICENTRIC) COUNTED AS 2 ABERRATIONS. LABELED CELLS OF ALL SAMPLES HAD 25 TO 100 GRAINS/CELL. TO PRODUCE 2 ABERRATIONS/CELL REQUIRED 870 RADS TO NUCLEUS FOR (B), 490 FOR (A) AND 520 FOR CO-60 GAMMA AT A DOSE RATE OF 0.25 TO 1.4 RAD/MIN FOR 9 HR FOR TOTAL GAMMA DOSE FROM 150 TO 900 RADS. TO PRODUCE 2 ABERRATIONS/CELL REQUIRED 1780 AND 3500 DISINT/NUCLEUS FOR (A) AND (B) RESPECTIVELY OR 490 AND 1050 RADS/NUCLEUS. ABERRATION FREQUENCY FOR (A) AND CO-60 GAMMA VARIED AS 1.8 TO 1.9 POWER OF DOSE, WHILE (B) WAS CLOSER TO 1.0. ON BASIS OF ENERGY ABSORBED/NUCLEUS, (A) WAS MORE EFFECTIVE THAN (B) IN PRODUCING ABERRATIONS, BUT NOT ON BASIS OF TOTAL ENERGY ABSORPTION/CELL. CF NSIC NOS. 64740, 49713, 49586, 62623, 58835, 64753.

*OXIDE + HAZARD, RELATIVE + *DOSE CALCULATION, INTERNAL + *CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *CHROMOSOMAL EFFECT + PHYSIOLOGY/METABOLISM + TOXICITY + DNA + MAMMAL, SMALL + CELL, NUCLEUS + ORGANIC + IN VITRO + *EFFECT, DOSE + *THYMIDINE

064773
RICHMOND CR + FURCHNER JE + LANGHAM WH
EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPCIW FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND TRITIUM (T1643)
LOS ALAMOS SCIENTIFIC LABORATORY, UNIVERSITY OF CALIFORNIA, LOS ALAMOS, NEW MEXICO
LAMS-2526 +. 9 PAGES, 4 REFERENCES, 2 TABLES, 2 FIGURES, PAGE 25-33, APRIL 1961

MPC OF A RADIONUCLIDE IS THAT AMT/CC OF AIR OR WATER TAKEN INTO BODY CONTINUOUSLY WITHOUT EXCEEDING RECOMMENDED ACTIVITY (Q) IN A SPECIFIC TISSUE, WHEN EQUIL CONDITIONS REACHED. INTEGRATION OF EFFECTIVE RETENTION FUNCTION, R(T), FROM T ZERO TO INFINITY GIVES TOTAL AREA UNDER CURVE WHICH IS AN ESTIMATE OF EQUIL LEVEL. (MPCIW IS Q/AI, WHERE Q IS MAX PERMISSIBLE BODY BURDEN, A EQUIL LEVEL OR AREA UNDER RETENTION FUNCTION, I DAILY WATER INTAKE. THIS REPORT SHOWS HOW A CAN BE ESTIMATED FROM INTERSPECIES CORRELATION. AREAS UNDER R(T) CURVES FOR MOUSE, RAT, DOG, MAN FOR ZN65 SHOWN TO POWER FUNCTION OF SPECIES WT, LAMS-2445 (1960) P 80. SIMILARLY FOR HTO, LAMS-2445 (1960) P 94. EQUIL LEVEL OF HTO VS BODY WT IN GM FOR MOUSE, RAT, RABBIT, DOG, MAN, HORSE FITTED BY FUNCTION A EQUAL TO 1.09 W (EXP +0.2099). (MPCIW FOR HTO IN UCI/ML BY ICRP (1959) 5 X 10 (EXP -2), BY HUMAN DATA 7 X 10 (EXP -2), FROM INTERSPECIES EXTRAPOLATION 6 X 10 (EXP -2), BY INTERSPECIES INTERPOLATION 8 X 10 (EXP -2), CONTINUOUS EXPOSURE, ORGANIC TRITIUM IGNORED. (MPCIW ZN-65 BY ICRP (1959) 10 (EXP -3), BY HUMAN DATA 2.4 X 10 (EXP -4) AND BY INTERSPECIES EXTRAPOLATION 2.4 X 10 (EXP -4). CF NSIC NOS. 49684, 49711, 62587, 64727, 64730, 64733, 64766, 56158.

MPBB + *MPC + OXIDE + ZINC + ICRP + *CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + MAMMAL, SMALL + MAMMAL, DOG + MODEL, BIOLOGICAL + MAMMAL, MOUSE + MAMMAL, RAT + MAMMAL, LARGE + MAN + *POWER FUNCTION + *WHOLE BODY + *MASS + RETENTION FUNCTION

064777
THOMPSON RC
REVIEW OF LABORATORY ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF TRITIUM (T7609)
BATTELLE MEMORIAL INSTITUTE + PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-SA-3739 +. 19 PAGES, 40 REFERENCES, 3 FIGURES, 1 TABLE, MAY 1971

WHILE INHALED HTO IS 100% RETAINED, LESS THAN 0.1% OF HT OR T2 IS RETAINED (NSIC NO. 64728). MAGNITUDE OF UNIDIRECTIONAL MOVEMENT OF HTO ACROSS INTACT SKIN BARRIER (DELONG, SCIENCE 114, 397 (1951)) WAS SURPRISING. ANIMALS (FROM 20-GM MOUSE TO 400,000-GM HORSE) CONTAIN ABOUT 60% BODY WATER WITH TURNOVER TIME INCREASING WITH BODY WT, KANGAROO RAT EXCEPTED (CF NSIC NO. 64770), LOG OF THE WATER LOSS PER DAY AN APPROXIMATE LINEAR FUNCTION OF LOG OF BODY WT (BUT SEE NSIC NO. 56158). THOMPSON, JBC 223, 795 (1956), MEASURED H3 LEVEL IN H1 FROM ORGANIC MATTER OF RATS AND FOUND 20% EQUILIBRATION WITH BODY WATER H, I.E., THE SPECIFIC ACTIVITY OF ORGANIC H WAS 20% OF THAT OF BODY WATER H, ALMOST 40% IN BRAIN, LESS THAN 10% IN FAT. MORE CRUCIAL EXPTS WHERE TOTAL H INTAKE IS UNIFORMLY H3 LABELED ARE NEEDED (CF NSIC NO. 64770). IT IS USUALLY ASSUMED THAT IF A RADIONUCLIDE HAS A LONG BIOL HALF-LIFE ITS UPTAKE IS CORRESPONDINGLY LOW, WHICH IS ONLY TRUE FOR A STEADY-STATE SYSTEM. LARGE AMTS OF H3 COULD GET TRAPPED IN OOCYTES UNTIL OVULATION TIME. LOW-WATER TISSUES LIKE BONE AND FAT GET LOWER DOSE THAN REMAINDER OF BODY (BUT SEE NSIC NO. 64766). BRUES, PSEBM 79, 174 (1952), FOUND AN LD50(30) OF 1 MCI/GM IN MOUSE, IP, OR 300 RADS IN 1ST DAY (12 RADS/HR), H3 BETA 1.7 TIMES AS EFFECTIVE AS CO60 GAMMA. MORE CHRONIC STUDIES NEEDED.

OXIDE + *WATER + CORRELATION + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + TOXICITY + SPECIFIC ACTIVITY + TURNOVER RATE + MAMMAL, SMALL + MAMMAL, RAT + MAMMAL, LARGE + EXPONENTIAL FUNCTION + EXPOSURE, CHRONIC + FAT + MAN + WHOLE BODY + *MASS + *ORGANIC + RETENTION FUNCTION + BRAIN + MONTH

064778
THOMPSON RC
EFFECT OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO TRITIUM OXIDE

064778 *CONTINUED*
HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
HW-30940 +. 34 PAGES, JANUARY 1, 1954(T3162)

RECOMMENDATIONS ON MAX PERMISSIBLE TRITIUM IN MAN HAVE ALL BEEN BASED ON ASSUMPTIONS OF (1) UNIFORM DISTRIB THROUGH BODY, (2) H3 LOSS FROM BODY SAME AS WATER LOSS FROM BODY, (3) H3 IN BODY ONLY AS HTO, NONE OF WHICH ARE NECESSARILY VALID. PURPOSE OF PRESENT REVIEW TO ASSESS PROBABLE ERRORS OF SUCH ASSUMPTIONS, BY ANALYSIS OF DATA IN THOMPSON, JBC 200, 731 (1953) FOR RAT SINGLE IP, THOMPSON, JBC 208, 883 (1954) FOR RAT MULTIPLE IP, HW-30437 (1954) FOR RAT CHRONIC INGESTIONG, FOR SHEEP SINGLE IP, HW-28363 (1953) AND FOR MAN CHRONIC EXPOSURE, LA-1468 (1952). HW-30437 SHOWED THAT 2ND GENERATION RATS EXPOSED FROM CONCEPTION AER HIGHER IN BOUND H3 THAN MOTHER FOR BRAIN, HEART, LUNGS, STOMACH. HW-28363 SHOWED THAT FATTY TISSUES OF SHEEP RECEIVED ABSORBED DOSE AS LARGE AS AVERAGE TOTAL DOSE TO BODY WATER. AV WHOLE-BODY DOSE FROM ORGANICALLY BOUND H3 IS ABOUT 10% OF BODY WATER H3 DOSE, BUT DOSE FROM BOUND H3 TO SOME TISSUE FRACTIONS (FAT, COLLAGEN) MAY BE GREATER THAN THAT TO WHOLE ORGANS, EMPHASIZING ERROR THAT ASSUMPTION (1) ABOVE CAN INTRODUCE. EXPOSURE LIMITS MAY HAVE TO BE REDUCED BY A FACTOR OF AT LEAST 2 BECAUSE OF LONG-TERM BOUND H3 ACCUMULATION. SINCE SPACE DOES NOT PERMIT TABULATION OF TISSUE AND TISSUE FRACTION CONCNS, BIOL HALF-LIVES AND DOSES, SEE ORIGINAL. CF NSIC NOS. 64777,64767.

OXIDE + HAZARD, RELATIVE + WATER + DOSE CALCULATION, INTERNAL + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + CONCENTRATION + *DISTRIBUTION + BLOOD + BONE + MAMMAL, RAT + MAMMAL, LARGE + EXPONENTIAL FUNCTION + EXPOSURE, CHRONIC + EXPOSURE, IP + *FAT + KIDNEY + LIVER + LUNG + MAN + MUSCLE + SKIN + STOMACH + TESTIS + THYROID + *ORGANIC + RETENTION FUNCTION + BRAIN + HEART + MONTH + ORGAN, OTHER

064779
MIGHISSI AA + CARTER MW
LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY, LAS VEGAS, NEVADA + SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY, MONTGOMERY, ALABAMA
4 PAGES, 2 FIGURES, 2 TABLES, 12 REFERENCES, HEALTH PHYSICS, VOL. 21, PP. 57-60 (JULY 1971)(T7611)

CF NSIC NOS. 64778,64730,64729,64727. 2 YOUNG WOMEN (26 AND 29 YRS OF AGE IN 1967 WHEN MONITORING STARTED) LEFT PLANT WHERE THEY HAD BEEN TRITIUM LUMINOUS DIAL PAINTERS WHEN DRINKING WATER CONTAINED 0.8 NCI/L, DROPPING TO 0.4 NCI/L IN JUNE 1969. URINARY EXCRETION FOR 1 SUBJECT WAS 3.2 E (EXP -0.021T) + 0.5 E (EXP -0.000343T) WITH 2ND TERM CORRESPONDING TO 2020 DAY EFFECTIVE HALF-LIFE. 2ND SUBJECT WAS 2.3 E (EXP -0.033T) + 0.2 E (EXP -0.00246T) WITH 2ND TERM CORRESPONDING TO 280 DAYS. THERE WAS A SEASONAL VARIATION IN BODY BURDEN, INCREASED WATER INTAKE IN SUMMER DILUTING THE TISSUE H3 BEING CONSTANTLY RELEASED TO THE BODY WATER, FOR 1ST SUBJECT, BUT THIS EXPLANATION NOT TENABLE FOR 2ND SUBJECT WHOSE EXCRETION RATE WAS CONSTANT. SINCE INITIAL DECREASE IN BODY BURDEN WAS NOT MEASURED, DOSE ASSESSMENT COULD NOT BE MADE. 2ND SUBJECT WENT BACK TO TRITIUM WORK AND SO WAS NO LONGER AVAILABLE FOR FURTHER STUDY. THE 34-DAY COMPONENT OBSERVED BY SNYDER (NSIC NO. 49605) CONTRIBUTED 2% OF TOTAL DOSE. THE 230-DAY COMPONENT OF MINDER (NSIC NO. 495491 CONTRIBUTED 5%. SANDERS (NSIC NO. 49550) ESTIMATED AN ORGANIC-BOUND TRITIUM COMPARTMENT OF 28.5 KG FOR A 100 KG MAN. PRESENT AUTHORS WERE NOT ABLE TO ESTIMATE THEIR COMPONENT SIZES.

MONITOR, PERSONNEL + SURVEY, USPHS + ANALYTICAL TECHNIQUE + WATER, DRINKING + *PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + LUMINARY + *EXCRETION, URINE + EXPONENTIAL FUNCTION + MAN + NATURE + WHOLE BODY + FEMALE + IC GROSSLY NORMAL + VARIABILITY + YEAR

064781
KIRCHMANN R + VAN DEN HOEK J + LAFONTAINE A
TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES
CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE, C.E.N., MOL, BELGIUM + LABORATORIUM VOOR FYSIOLOGIE DER DIEREN, WAGENINGEN (THE NETHERLANDS) + INSTITUT L'HYGIEN ET D'EPIDEMIOLOGIE, MINISTERE DE LA SANTE PUBLIQUE, BELGIUM
6 PAGES, 1 FIGURE, 4 TABLES, 9 REFERENCES, HEALTH PHYSICS, VOL. 21, PP. 16-166 (JULY 1971)

NUCLEAR REACTORS GENERATE TRITIUM (MAINLY AS OXIDE) AS WILL NUCLEAR EXCAVATION AND MINING. LAB ANIMAL STUDIES WITH HTO CANNOT BE EXTRAPOLATED RELIABLY TO ENVIRONMENTAL HUMAN POPULATION CONDITIONS INVOLVING ORGANIC TRITIUM. EQUILIBRATION OF TRITIUM IN FORM OF HTO WITH BODY WATER IS RAPID (MINUTES OR HOURS), BUT EQUILIBRATION OF TRITIUM IN FORM OF GRASS WITH ORGANIC CONSTITUENTS OF THE ANIMAL BODY IS SLOW (DAYS). TRITIUM IN THE ORGANIC COMPARTMENTS BEING 10 TIMES HIGHER IN COWS FED TRITIATED GRASS THAN IN COWS FED TRITIATED WATER. GRAZING LAND USED WAS IN DOMAIN OF CENTRE D ETUDE D L ENERGIE NUCLEARE A MOL, THE TRITIUM SOLN (500 LITERS) DISPERSED FROM A JEEP TO GIVE GRASS ACTIVITY OF 450, 180, 230, 17 UCI HTO/M2 IN WINTER, SPRING, SUMMER, AUTUMN RESPECTIVELY, REPRESENTING 375, 250, 250, 300 ML HTO/M2 DEPOSITED. THE COWS (ARDENNAISE AND CAMPIONISE) GAVE ABOUT 12-20 L MILK IN SPRING AND 5-10 L IN AUTUMN. H3 INCORPORATED INTO DRY MATTER OF GRASS WAS 14-19% OF THE FRESH WT. SP ACT OF MILK COMPONENTS IN NCI H3/GM H FOR CASEIN, LACTOSE AND WATER CONTENTS AFTER 7 DAYS OF INGESTION WERE RESPECTIVELY 47, 72, 184, BUILDING UP MORE SLOWLY IN THE ORGANIC COMPONENTS THAN IN THE WATER. SEE ORIGINAL FOR DATA UP TO 28 D. CF NSIC NOS. 56180, 49713, 49533, 49601, 64768, 64724, 64776.

INGESTION + PLOWSHARE + WATER + BELGIUM + *MILK + MONITOR, ENVIRONMENTAL + POPULATION EXPOSURE + HAZARDS ANALYSIS + REACTOR, LWR + ECOSYSTEM, GRASSLAND + *CONSUMER PRODUCT + *RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *FOOD CHAIN + SPECIFIC ACTIVITY + TURNOVER RATE + PRODUCTION, RATE + EXPOSURE, CHRONIC + PROTEIN + FOOD INTAKE + *ORGANIC + MAMMAL, COW

064783
MOORE R
COMPARISON OF HTO IN PLASMA AND EXPIRED WATER VAPOR
RESEARCH LABORATORIES, AMERICAN NATIONAL RED CROSS, WASHINGTON, D. C.
9 PAGES, HEALTH PHYSICS, VOL. 7, PP. 161-169 (1962)(T7613)

CF NSIC NO. 64782. WITH THE AID OF MONES BERMAN, AND USING A 90-DAY HALF-LIFE FOR H3 REINCORPORATED INTO PROTEIN (NSIC NO. 64727), AUTHOR USES HIS BLOOD, URINE, BREATH DATA FROM A 21-YR-OLD NORMAL 73 KG MALE TO SET UP A 4-COMPARTMENT MODEL (5 EXPONENTIAL TERMS) CONSISTING OF IV INJECTION INTO PLASMA WATER (K21,K12) EXTRAVASCULAR WATER, PLASMA WATER(K2)URINE WATER, PLASMA WATER(K41,K14)PLEURAL WATER, RESPECTIVE TRANSFER COEFFICIENTS BEING K12 OF 0.043 +-0.006/MIN, K21 OF 0.043 +-0.009, K31 OF 0.0013 +-0.0003, K14 OF 0.770 AND K41 OF 0.0048 +-0.0002. COMPARTMENT SIZES WERE K1 (PLASMA HTO SPACE + EXTRACELLULAR HTO SPACE) OF 44 +- 2 LITERS OR 60% OF BODY WT, K2 (LUNG HTO SPACE) OF 0.25 LITERS OF 0.36% OF BODY WT, K3 (URINE HTO SPACE) OPEN, K4 (INTRACELLULAR HTO SPACE) OF 12 LITERS OF 16.6% OF BODY WT. 634 UCI OF HTO TO SUBJECT (157 MREM DOSE) WAS FITTED WITH 5-EXPONENTIAL PLASMA-WATER CURVE OF TYPE, A E (EXP -BT), WHERE RESPECTIVE A VALUES WERE 18.6,1.31,2.4,14.2,0.6 AND B VALUES 10.3,0.68,0.017,0.0025,0.00032 (NCI/GM VS TIME IN HR). 2ND INJECTION OF 644 UCI GAVE A 12.6,2.2,0.9,13.3,0.6 AND B 8.5,0.33,0.025,0.0025,0.0032. NET SP ACT RATIO OF BREATH WATER/PLASMA WATER (NCI/GM) VARIED FROM 0.88 TO 1.29 BETWEEN 0 AND 252 MIN.

BIOMEDICAL + COMPUTER PROGRAM + OXIDE + DOSE CALCULATION, INTERNAL + *MATHEMATICAL TREATMENT + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + *RESPIRATION + PHYSIOLOGY/METABOLISM + *MODEL, BIOLOGICAL + *EXCRETION, URINE + EXPONENTIAL FUNCTION + EXPOSURE, IV + MAN + MATURE + MALE + IC GROSSLY NORMAL + RETENTION FUNCTION + VARIABILITY + *BLOOD, PLASMA + BODY FLUID + EFFECT, MASS + *HOUR + METABOLIC KINETICS

065087
VAUGHAN BE
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-1550 VOL. 2, PT. 2 +. 108 PAGES, MARCH 1971

62 RESEARCH TOPICS ARE REPORTED. A SMALL BUT IMPORTANT PART OF THE TOTAL EFFORT IS IN PROGRAMS CONCERNED WITH THE ARID LANDS-ECOLOGY RESERVE (FOR WHICH THE LONG RANGE OBJECTIVE IS TO STUDY THE EFFECT OF ENVIRONMENTAL MODIFICATIONS BY WILDFIRE, IRRIGATION, GRAZING, HERBICIDAL APPLICATIONS, ETC.). EFFORTS ARE DESCRIBED TO PERMIT CONSERVATION-ORIENTED GROUPS TO GAIN A BETTER UNDERSTANDING OF AECS LONG INTEREST AND SUPPORT IN ECOLOGY. SEVERAL ELEMENTS OF THE SIMULATION OF THE LICHEN-CARIBOU-ESKIMO FOOD CHAIN ARE BEING REFINED. EFFORTS ARE CONTINUING IN REACTOR SITING PROBLEMS INCLUDING INJURY TO FISH BOTH FROM THERMAL EFFECTS AND FROM POTENTIAL HAZARDS ASSOCIATED WITH CHRONIC RADIOACTIVITY DISCHARGE. LONG-TERM STUDIES OF CANADA GOOSE POPULATIONS ON THE COLUMBIA RIVER ARE REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + FIRE + WASTE DISPOSAL + ZINC + RIVER, COLUMBIA + *BATTELLE NORTHWEST + ECOSYSTEM, GRASSLAND + DESTRUCTIVE WIND + SOIL PROPERTY, IN SITU + THERMAL POLLUTION + *RADIONUCLIDE UPTAKE + ECOSYSTEM, AQUATIC + FOOD CHAIN + ECOSYSTEM + RADIATION EFFECT + ECOSYSTEM, ARCTIC + ECOSYSTEM, DESERT + *RESEARCH, GOVERNMENT + PLANT, SEEDLING

065088
STRAND JA + TEMPLETON WL + TANGEN EG
EFFECTS OF IRRADIATION ON EMBRYOGENESIS OF FISH AND FIXATION AND LONG-TERM ACCUMULATION OF TRITIUM IN AN EXPERIMENTAL AQUATIC ENVIRONMENT
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-1550, VOL. 2, PT. 2 +. PAGE 2.36-2.40, MARCH 1971

PRELIMINARY CONSIDERATION OF DATA INDICATES NO SIGNIFICANT DEGREE OF DETRIMENT OF EMBRYOGENSIS OF MARINE TELEOST FISH, AS RESULTING FROM EXPOSURE TO LEVELS OF 0.01, 0.1 AND 1.0 MICROCI/ML OF TRITIUM. HOWEVER, THE PRESENT EFFORT TREATS ONLY A PORTION OF THE EARLY LIFE STAGES. LONGER-TERM STUDIES WILL BE NECESSARY TO INVESTIGATE THE PROBLEM FULLY, TO EXAMINE FIRST EMBRYONIC MITOSIS (FOUR-CELL BLASTOMERE STAGE), AND TO EXAMINE TIME OF REABSORPTION OF YOLK SAC. A PROGRAM WAS INITIATED TO DETERMINE THE CONCENTRATION OF TRITIUM BY THE FOOD WEB.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*RADIONUCLIDE UPTAKE + *ANIMAL, FISH + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + MARINE ORGANISM + CONCENTRATION FACTOR + *EMBRYO

065101
ECOLOGICAL ASPECTS OF TRITIUM BEHAVIOR IN THE ENVIRONMENT
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
12 PAGES, NUCLEAR SAFETY, 12(4), PG. 325-337, AUGUST 1971

REVIEW OF LITERATURE ON TRITIUM IN DISCHARGES FROM POWER REACTORS AND FUEL REPROCESSING PLANTS, AND ON UPTAKE BY PLANTS AND ANIMALS FROM FOOD AND WATER. WHEN ORGANISMS ARE EXPOSED TO TRITIATED WATER (HTO), ABOUT TENFOLD MORE TRITIUM IS FOUND IN BODY WATER THAN IN TISSUE. FOR HUMANS THE RETENTION HALF-LIFE IS GREATER FOR TISSUE-BOUND TRITIUM (AS LONG AS 2000 DAYS FOR THE LONGER COMPONENT WITH CERTAIN ORGANS) THAN FOR TRITIUM IN BODY WATER (9.5 DAYS). THE PROPORTION OF TRITIUM RETAINED IN BODY TISSUE OR MILK IS MUCH GREATER FOR UPTAKE FROM FOOD THAN FROM WATER. TURNOVER TIMES OF TRITIUM AND HYDROGEN DO NOT DIFFER SIGNIFICANTLY IN NATURAL ECOSYSTEMS, AND THERE IS NO SIGNIFICANT CONCENTRATION RELATIVE TO HYDROGEN IN FOOD CHAINS.

065101 *CONTINUED*
AIRBORNE RELEASE + CONTAINMENT, FUEL REPROCESSING + RELEASE RATE + *REACTOR, POWER + ISOTOPIC FRACTIONATION + RADIOACTIVITY RELEASE + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + FOOD CHAIN + *ECOSYSTEM + ECOSYSTEM, FOREST + CONCENTRATION FACTOR + *ECOSYSTEM, DESERT + RETENTION

065172
CAHILL DF
SOME EFFECTS ON MAMMALIAN DEVELOPMENT OF CONTINUOUS IRRADIATION IN UTERO WITH TRITIATED WATER
ROCHESTER UNIVERSITY, NEW YORK DEPT. OF RADIATION BIOLOGY AND BIOPHYSICS
UR-49-1254 +. 86 PAGES, 1970

TO INVESTIGATE THE CONSEQUENCES OF CONTINUOUS, IN UTERO EXPOSURE TO HTO, GROUPS OF 12-17 SPRAGUE-DAWLEY RATS WERE MAINTAINED AT BODY WATER LEVELS OF 0, 1, 10, 20, 50, 75, AND 100 MICROCURIES/ML HTO THROUGH PREGNANCY. THE INITIAL MATERNAL BODY BURDENS WERE ESTABLISHED ON THE DAY OF POSITIVE SPERM DETERMINATION BY INTRAPERITONEAL INJECTION OF HIGH SPECIFIC ACTIVITY HTO. BODY WATER HTO LEVELS WERE THEN MAINTAINED AT A CONSTANT LEVEL DURING PREGNANCY BY PROVIDING HTO IN DRINKING WATER SUPPLIES. THESE HTO ACTIVITIES PROVIDED IRRADIATION AT 0.3 - 30 RADS/DAY TO THE EMBRYO AND FETUS DURING DEVELOPMENT

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + EFFLUENT + MEASUREMENT + *WATER + REACTOR, POWER + *WATER, DRINKING + *EXPERIMENT + FUEL REPROCESSING + CONCENTRATION + RADIATION EXPOSURE, CHRONIC + *RADIATION EFFECT + *MAMMAL, RAT + *BODY BURDEN

065163
KIPCHMANN R + VANDENHOEK J + LAFONTAINE A
TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS
5 PAGES, HEALTH PHYSICS, 21(2), PAGE 61-66, (JULY 1971)

CONTAMINATION OF GRAZING LAND BY THE DEPOSITION OF TRITIATED WATER HAS MADE IT POSSIBLE TO CALCULATE THE LEVEL OF INCORPORATION OF TIRITUM INTO THE GRASS AND TO FOLLOW THE PATTERN OF CONTAMINATION AFTER DEPOSITION OF DIFFERENT SEASONS. IT WAS ALSO POSSIBLE TO DETERMINE THE LEVEL AND RATE OF TRANSFER AND THENCE THE DISTRIBUTION OF TRITIUM IN THE MILK PRODUCED BY COWS EATING THE CONTAMINATED GRASS. THESE DATA ARE COMPARED WITH THOSE OBTAINED FOR THE CONTAMINATION OF MILK RESULTING FROM THE REPATED INGESTION OF TRITIATED WATER. IT APPEARS THAT THE TRITIUM IN THE ORGANIC MATERIAL IS 10 TIMES HIGHER IN THE CASE OF COWS FED WITH CONTAMINATED GRASS THAN FOR COWS DRINKING TRITIATED WATER.

*INGESTION + *WATER + *MILK + CONTAMINATION + *ECOSYSTEM, GRASSLAND + *CONCENTRATION + RADIONUCLIDE TRANSFER + COMPARISON + ORGANIC + *MAMMAL, COW + PLACENTAL TRANSFER

065659
MARTIN P
EFFECTS OF TRITIUM DECAY ON DNA
NORTHWEST UNIVERSITY, CHICAGO, ILLINOIS, DEPT. OF MICROBIOLOGY
COO-1603-3 +. 6 PAGES, SEPTEMBER 30, 1969

REPORTS ON STUDY TO EXAMINE - (1) THE EFFECTS OF VARYING DOSES OF TRITIUM, INCORPORATED INTO VARIOUS MACROMOLECULES OF THE CELL, ON CELL VIABILITY, ON MUTATION FORMATION AND ENZYME FORMING ABILITY, (2) THE EFFECTS OF TRITIUM DECAYS ON LABELED DNA ISOLATED AND STORED FROZEN, AND (3) THE EFFECTS OF ALTERED DNA REPAIR MECHANISMS AND/OR RADIOPROTECTIVE AGENTS ON SENSITIVITY TO TRITIUM DECAYS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*CHROMOSOMAL EFFECT + TEMPERATURE + *RADIATION EFFECT + DNA + CELL + ENZYME + MUTATION + CHELATE + *EFFECT, DOSE

065935
KAUFMAN SL + COLVIN MC + LIEBERMAN R + MOGHISSI AA + REHNBERG BF + MCMILLAN RC
INVESTIGATION OF TRITIATED LUMINOUS COMPOUNDS
ENVIRONMENTAL PROTECTION AGENCY, RADIATION RESEARCH, ROCKVILLE, MARYLAND
ERL-71-2 +. 14 PAGES, 2 FIGURES, 4 TABLES, JUNE 1971

THE CUTANEOUS AND GASTROINTESTINAL TRACT ABSORPTION OF FOUR TRITIATED LUMINOUS COMPOUNDS WAS STUDIED IN EXPERIMENTAL ANIMALS. THE PERCENT ABSORPTION OF THE INDIVIDUAL COMPOUNDS VIA THE CUTANEOUS ROUTE VARIED FROM 0.10 TO 8.83% AND VIA THE GASTROINTESTINAL ROUTE FROM 0.67 TO 21.55%. THE DATA SHOW A POSITIVE CORRELATION BETWEEN THE RELATIVE ABSORPTION OF THE INDIVIDUAL LUMINOUS COMPOUNDS THROUGH BOTH THE CUTANEOUS AND GASTROINTESTINAL ROUTES. TRITIUM ACTIVITY WAS ELIMINATED IN TWO COMPONENTS. A SLOW COMPONENT WAS SEEN TO REPPESENT TRITUM ACTIVITY IN THE FORM OF TRITIATED WATER (HTO), WHILE A MORE RAPID COMPONENT WAS THOUGHT TO BE TRITIUM INCORPORATED IN OTHER COMPOUNDS SOLUBLE IN URINE AND OTHER BODY FLUIDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ABSORPTION + ANIMAL + *COMPARISON + *LUMINARY + EXCRETION, URINE + *GI TRACT + *SKIN + BODY FLUID

065955
STRAND JA + TEMPLETON WL + TANGEN EG
ACCUMULATION AND RETENTION OF TRITIUM IN EMBRYO AND LARVAL FISH AND RADIATION EFFECT
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-SA-3711 +. 20 PAGES, 1971

ARTIFICIALLY SPAWNED RAINBOW-TROUT EGGS WERE EXPOSED TO SPRING WATER SPIKED WITH 0.01-10 MICROCI/ML OF TRITIUM. TRITIUM UPTAKE REACHED EQUILIBRIUM WITHIN 1-2 DAYS. ABOUT 20% OF THE TRITIUM WAS ORGANICALLY BOUND. ELUTION BY FREE-FLOWING WATER COULD BE APPROXIMATELY DESCRIBED BY HALF-TIMES OF 1-2 AND 17 DAYS. WITH EXPOSURE DURING EMBRYOGENESIS IN WATER SPIKED WITH 1 MICROCI/ML, THE INCIDENCE OF ABNORMAL LARVAE AND BEHAVIORAL AND PHYSIOLOGICAL TESTS FAILED TO SHOW A RADIATION EFFECT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HANFORD SITE + RADIONUCLIDE UPTAKE + *ANIMAL, FISH + BIOACCUMULATION/TURNOVER + PHYSIOLOGY/METABOLISM + GROWTH/DEVELOPMENT + RADIATION EFFECT + *EGG + *EMBRYO

066269
NELSON VA
EFFECTS OF IONIZING RADIATION AND TEMPERATURE ON THE LARVAE OF THE PACIFIC OYSTER, CRASSOSTREA GIGAS
WASHINGTON UNIVERSITY, SEATTLE, LAB. OF RADIATION ECOLOGY
RLO-2225-5-1-3 +. 24 PAGES, MAY 10, 1971

STATISTICALLY SIGNIFICANT INCREASES IN THE NUMBER OF ABNORMAL LARVAE WERE OBSERVED AT ZN-65 AND H-3 CONCNS. OF 0.0001 AND 0.001 CI/LITER (ABOUT 1 RAD), OR AT 10 RADS FROM X-RAYS. NO RADIATION EFFECTS WERE FOUND ON THE RATE OF DEVELOPMENT OR SURVIVAL AT ABOUT TEN-FOLD GREATER DOSES. NO INTERACTION EFFECTS OF IONIZING RADIATION AND TEMPERATURE WERE FOUND. CHRONIC IRRADIATION WAS MORE DAMAGING THAN THE ACUTE. THE OYSTER LARVAE IN WALLAPA BAY WOULD ONLY BE AFFECTED BY THERMAL SHOCK IN PASSING THROUGH THE CONDENSERS OF NUCLEAR POWER PLANTS, SINCE A 300,000 TIMES GREATER THAN THE PRESENT TRITIUM LEVEL IS NEEDED TO AFFECT THEM AND SINCE A SMALL INCREASE IN TEMPERATURE OF THE WATER IS PROBABLY BENEFICIAL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SITING + ZINC + ESTUARY + GAMMA + THERMAL POLLUTION + *RADIONUCLIDE UPTAKE + GROWTH/DEVELOPMENT + *MOLLUSC + *LARVA + BENEFICIAL USE, AQUACULTURE

066272
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-3961 +. 49 PAGES, 1971

INCLUDES A 600-WORD TOPICAL SUMMARY ON GENETIC EFFECTS AT LOW DOSES. 200-300 WORD SUMMARIES ON PROJECTS IN THE SECTIONS, BIOLOGY (BIOCHEMISTRY AND MOLECULAR BIOLOGY, GENETICS AND POPULATIONS), AND POPULATION RESEARCH (HEREDITARY CHANGES IN VERTEBRATES, SOMATIC, AND GENETIC HARM IN HUMAN POPULATIONS). 50-150 WORD SUMMARIES IN THE SECTIONS, ENVIRONMENTAL RESEARCH (OFF-SITE AND EFFLUENT MONITORING, RADIOECOLOGY, PRODUCTIVITY STUDIES BY THE C-14 TECHNIQUE, RADIATION PROCESSING OF WASTE WATER, LOW LEVEL COUNTING) AND HEALTH PHYSICS (PLASTIC FILM-FISSION FRAGMENT NEUTRON DOSIMETRY, NAI DETECTOR EFFICIENCY, THERMOLUMINESCENCE DOSIMETRY, TRITIUM MONITORING, RADIATION INSTRUMENT DEVELOPMENTS).

*BIOMEDICAL + DOSIMETRY + EFFLUENT + STRONTIUM + WASTE TREATMENT + XENON + DOSIMETRY, THERMOLUMINESCENCE + POPULATION EXPOSURE + CHALK RIVER + MONITORING PROGRAM, ENVIRONMENTAL + PLASTICS + LAKE + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + PHYSIOLOGY/METABOLISM + EFFECT, GENETIC + EFFECT, SOMATIC + *RADIATION EXPOSURE, CHRONIC + TRACE ELEMENT + MAN + RADIATION MONITORS

067023
DUNN A + STRAHS S
COMPARISON OF H3- AND C14-GLUCOSE METABOLISM IN THE INTACT RAT
UNIVERSITY OF SOUTHERN CALIFORNIA
2 PAGES, 1 TABLE, 7 REFERENCES, NATURE, VOL. 202(4972), PP. 705-706 (FEBRUARY 13, 1965)(T7645)

CF NSIC NOS. 64769, 64763, 67024. FROM 30 TO 130 MINUTE SAMPLINGS OF VENOUS BLOOD FOLLOWING INTRA-ARTERIAL INJECTION OF A MIXTURE OF D-GLUCOSE-U-C14 (A) + D-GLUCOSE-6-H3 (B) (AMTS UNSPECIFIED) AUTHORS CONCLUDE THAT (B) CANNOT BE USED AS A QUANT TRACER FOR THE GLUCOSE CARBON CHAIN IN INTACT RAT SINCE RATIO OF H3/C14 DID NOT REMAIN CONSTANT BU DECREASED WITH TIME, DUE TO CLEAVAGE OF H-C BOND AND/OR TRITIUM ISOTOPE EFFECT. 40-50% OF THE GLUCOSE POOL UNDERWENT HYDROGEN EXCHANGE IN 130 MIN ACCORDING TO PLASMA H3/C14 CHANGE, SOME OF WHICH COULD BE DUE TO H-C CLEAVAGE BY OXIDATION TO GLUCURONIC ACID. H3 IS NOT REMOVED FROM THE C6 OF INTRACELLULAR GLUCOSE FORMED FROM GLYCEROL-3-H3, 1,3-C14 BY IN-VITRO RAT LIVER, ACCORDING TO BLOOM, JBC 239,967 (1964), SINCE H3/C14 FROM ISOLATED GLYCOGEN DID NOT CHANGE. LOCATION OF EXTRAHEPATIC CLEAVAGE OF H-C NOT KNOWN. AT 0, 30, 60, 90, 110, 130 MIN RESPECTIVE H3/C14 RATIOS WERE 8.3, 7.5, 6.5, 5.3, 4.2, 4.0, THE CORRESPONDING % H3 LOST RELATIVE TO INITIAL H3/C14 BEING 9.6, 12.2, 36.1, 49.4, 51.8, FOR (A) + (B) INJECTION. GLUCOSE-6-C14 + GLUCOSE-6-H3 DATA ALSO TABULATED. VON HOLT, BIOCHEM Z 334, 524 (1961), FOUND 12% OF PLASME GLUCOSE DERIVED FROM GLUCOSE DEGRADATION PRODUCTS IN 120 MIN FOR NON-FASTED RATS, PRESENT EXPT POSTABSORPTIVE.

CARBON + *ANALYTICAL TECHNIQUE + *TRACER + *CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE +

067023 *CONTINUED*
*BIOCHEMICAL + PHYSIOLOGY/METABOLISM + RADIONUCLIDE TRANSFER + MOLECULAR EFFECT + MAMMAL, RAT + *OBSERVED RATIO + ORGANIC + RETENTION FUNCTION + *BLOOD, PLASMA + EFFECT, MASS + HOUR

067088
OSBORNE RV
PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER LABORATORIES
15 PAGES, RADIATION RESEARCH, VOL. 50, PP. 197-211 (1972)

THE BENEFIT OF PRODUCING 1 GRAM-MICROLAMBERT HAS A RISK OF 0.16 MILLIREM ACCORDING TO ONE TRITIUM LUMINOUS PAINT PLANT STUDY (NSIC NO. 64780), EMPLOYEES AVERAGING 20 UCI/L IN URINE. WORKERS AT ONE PLANT REACHED ONE MAX-PERMISSIBLE BODY BURDEN WITHIN A FEW WEEKS (NSIC NO. 64784), NAMELY 2000 UCI, ASSUMING ALL BODY TRITIUM IN HTO FORM AND ASSUMPTION WHICH HAS BEEN QUESTIONED (NSIC NO. 64766). FOR ADDNL ASSUMPTIONS ABOUT TRITIUM EXPOSURE IN MAN SEE NSIC NOS. 64778, 64777,64775,64776, 64773. URINARY TRITIUM OF PERSONS WEARING TRITIUM-ACTIVATED LUMINOUS-DIAL WRIST WATCHES MAY AVERAGE 3 NCI/L AS AGAINST 0.7 +-0.2 FOR THOSE WHO DO NOT (NSIC NO. 670891). -- PURPOSE OF PRESENT REVIEW BY OSBORNE WAS TO RELATE TRITIUM LEVELS IN MAN AND HIS ENVIRONMENT TO A DOSE EQUIVALENT FOR MAN. ABOUT 40% OF A PERSON'S WATER THROUGHPUT IS TAKEN IN AS DRINKING WATER (FOOD WATER EXCLUDED), HENCE H3 CONCN IN BODY WATER TAKEN TO BE 40% OF THAT INGESTED. HIGHEST WATER CONCN OF 80% IS IN GONADS OR 32% OF INGESTED WATER. ASSUME GONADS 100% WATER, THEN AT BODY WATER H3 OF 69 UCI OR 1.6 UCI/KG, DOSE-EQUIV RATE IS 170 MREM/YR TO GONADS, THE AVERAGE POPULATION DOSE-RATE LIMIT RECOMMENDED BY NCRP 39 (1971). USING ICRP 2 (1959) AND ICRP 10 (1968)(NSIC NO. 64775) ASSUMPTIONS, OSBORNE ESTIMATES A CHRONICALLY MAINTAINED BODY BURDEN OF 91 UCI OF H3 AS AGAINST 69 BY ICRP TO DELIVER 170 MREM/YR WHEN INGESTED WATER CONTAINS 4.7 UCI/KG AS AGAINST 1.6, OR CORRESPONDING AIR CONCNS AT 0.16 AND 0.08 UCI/M3 RESPECTIVELY.

BIBLIOGRAPHY + HYDROGEN + INGESTION + INHALATION + *MPBB + MPC + OXIDE + HAZARD, RELATIVE + WATER + AIR + DOSE CALCULATION, INTERNAL + WATER, DRINKING + POPULATION EXPOSURE + ICRP + NCRP + PERSONNEL EXPOSURE, RADIATION + ENVIRONMENT + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + EFFECT, GENETIC + DNA + MODEL, BIOLOGICAL + EXPOSURE, ACUTE + EXPOSURE, CHRONIC + MAN + MATURE + BENEFIT VS RISK + BODY FLUID

067122
HATCH FT + MAZRIMAS JA
TRITIATION OF ANIMALS FROM TRITIATED WATER (T7734)
LAWRENCE LIVERMORE LABORATORY, UNIVERSITY OF CALIFORNIA
6 PAGES, 2 FIGURES, 5 TABLES, 57 REFERENCES, RADIATION RESEARCH, VOL. 50, PP. 339-344 (1972)

CF NSIC NOS. 67088, 64733, 64721. TRITIUM IS OF PRIME CONCERN WITH RESPECT TO NUCLEAR REACTORS, THERMONUCLEAR REACTORS, FUEL PROCESSING, NATURAL-GAS STIMULATION AND OTHER MINING OPERATIONS, AND COULD PUT A LIMIT ON FUTURE POWER PRODUCTION, UNLESS PROPERLY CONTROLLED (NSIC NO. 64787). KANGAROO RATS TRAPPED 3 YRS LATER IN AREA OF 1962 SEDAN CRATER WERE RECEIVING TISSUE DOSES OF 25 RAD/YR WITH SMALL BUT SIGNIFICANT DNA CHANGES (NSIC NO. 64770). THOMPSON HAS EXPRESSED NEED FOR MORE CHRONIC STUDIES (NSIC NO. 64777). TRITIUM IN ORGANIC COMPARTMENTS OF COWS FED TRITIATED GRASS WAS 10 TIMES HIGHER THAN WHEN FED TRITIATED WATER (NSIC NO. 64781). A 4-COMPARTMENT MODEL FOR HTO HAS BEEN SUGGESTED BY MOORE, NSIC NO. 64783... USING 35 +-2 GM SWISS MICE WITH A PRIMING INJECTION DOSE OF 100 UCI/GM BODY WT, FOLLOWED BY ORAL AD LIB DRINKING WATER WITH 94 +-4.8 UCI/ML FOR 40 TO 147 DAYS, AND KANGAROO RATS SIMILARLY PRIMED FOLLOWED BY REINJECTION AT 12 TO 21-DAY INTERVALS FOR A TOTAL OF 90 DAYS, THE PRESENT AUTHORS CLAIM TO BE THE FIRST TO DEMONSTRATE CONCLUSIVELY INCORP OF T FROM HTO INTO DNA OF AN ANIMAL. TRITIUM CONCNS IN FREE TISSUE WATER AND IN DRY TISSUE FOR MOUSE WERE LIVER 83.9 AND 17.8 UCI/GM RESPECTIVELY AT 41 DAYS, 72 TO 91 AND 10.7 AT 90 DAYS - TESTES AT 41 DAYS 63.6 AND 12.8, AT 147 DAYS FROM 65 TO 80 AND FROM 17 TO 30 UCI/GM OR A MEAN OF 69.5 UCI/GM FOR FREE HTO AND A MEAN OF 20.2 UCI/GM FOR DRY TISSUE TRITIUM. CONTD NSIC NO. 67123.

OXIDE + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *CONCENTRATION + MAMMAL, MOUSE + GI TRACT + LIVER + MATURE + TESTIS + FEMALE + MALE

067123
HATCH FT + MAZRIMAS JA
TRITIATION OF ANIMALS FROM TRITIATED WATER (CONTD) (T7734)
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
14 PAGES, 2 FIGURES, 5 TABLES, 57 REFERENCES, RADIATION RESEARCH VO. 50, PP. 344-357 (1972

CONTD FROM NSIC NO. 67122. TISSUE CONCNS OF FREE HTO AND BOUND T (AVERAGE OF 3 ANIMALS) WERE LIVER 82.3 UCI HTO/GM AND 13.1 UCI/GM DRY TISSUE, TESTED 49.5 AND 20.2, INTESTINAL MUCOSA 81.5 AND 14.1 AT 41 TO 147 DAYS OF EXPOSURE FOR THE LAB MICE, AND CORRESPONDING VALUES FOR THE KANGAROO RATS (D. MERRIAMI) WERE 66.0, 10.8 FOR LIVER AND 47.1, 3.9 FOR INTESTINAL MUCOSA. MICE DRANK SPECIFIC ACTIVITY 94 +-4.9 UCI/ML. RATS WERE INJECTED PERIODICALLY WITH HTO SOLN AND FED DRY DIET WITH SIMILAR RESULTS. MOUSE TISSUE HTO SPEC ACT WAS 77.8 +-10.1 UCI/ML IN ABOVE 3 ORGANS BY DILUTION FROM METABOLIC WATER + FOOD WATER. BOUND T SPEC ACT WAS 15.8 +-6.0 UCI/GM DRY TISSUE. IN BOTH SPECIES SP ACT OF NON-AQUEOUS TISSUE HYDROGEN WAS 25 TO 40% OF TISSUE WATER HYDROGEN. MOUSE LIVER DNA NONEXCHANGEABLE T SP ACT WAS 12% OF TISSUE WATER HYDROGEN, ALL 4 DNA BASES LABELED. EXPIRED HTO VAPOR SPEC ACT RELATIVE TO TISSUE HTO WAS 0.44 IN RAT, 0.64 IN MOUSE. AVERAGE TISSUE H 7.0% BY WT, WATER H 11.1%. 4% H IN DNA, 25% OF THEM EXCHANGEABLE. EXPIRED HTO AVERAGED 19.9 +-8.7 NCI/ML AND TISSUE HTO 45.3 +-17.9 NCI/ML IN 8 RATS. AUTHORS ASSUMED 0.74 GM H2O/GM SOFT TISSUE FROM NSIC NO. 49684. 147-DAY DOSE CALCD TO BE 2630 RAD TO SOFT TISSUE, 6.7% FROM BOUND T. ORGANIC-BOUND T MAY CONTRIBUTE 8 TO 40% OF INFINITE DOSE COMMITMENT. CF NSIC NO. 67124.

HYDROGEN + INGESTION + OXIDE + WATER + DOSE CALCULATION, INTERNAL + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE +

067123 *CONTINUED*
BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + *CONCENTRATION + SPECIFIC ACTIVITY + *DNA + MAMMAL, MOUSE + MAMMAL, RAT + EXPOSURE, IP + LIVER + MATURE + ORGANIC

067124
THOMPSON RC + BALLOU JE
STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS TRACER. 5. PREDOMINANTLY NON-DYNAMIC STATE OF BODY CONSTITUENTS IN RAT (T7735)
RADIOLOGICAL SCIENCES DEPARTMENT, GENERAL ELECTRIC COMPANY, RICHLAND, WASHINGTON
85 PAGES, 3 FIGURES, 3 TABLES, 28 REFERENCES, JOURNAL OF BIOLOGICAL CHEMISTRY, VOL. 223, PP. 795-809 (1956)

CF NSIC NOS. 67122, 64777, 67086. SCHOENHEIMER'S FAMOUS CONCEPT OF DYNAMIC STATE OF BODY CONSTITUENTS IN THE 1940'S BASED ON HIS CLASSIC N15 AND H2 STUDIES, COUPLED WITH SHORT-TERM RADIONUCLIDE EXPTS IN 1950'S AND 60'S WHICH FAILED TO DETECT NON-DYNAMIC BODY CONSTITUENTS, LEAVE IMPRESSION THAT THERE ARE NO SIGNIFICANT METABOLICALLY-INERT TRITIUM COMPONENTS OF BODY. STARTING WITH TWELVE 235 GM FEMALE SPRAGUE-DAWLEY RATS INJECTED WITH PRIMING DOSE OF HTO SUFFICIENT TO BRING BODY WATER CONCN TO 3.4 UCI/ML, WITH DRINKING WATER CONTAINING 5.0 UCI/ML FOR 124 DAYS THEREAFTER, WITH MATING 6 WKS AFTER START OF REGIME, OFFSPRING NURSED AND WEANED ON SAME TRITIUM REGIME UNTIL 6 MONTHS OF AGE - PRESENT AUTHORS FOUND THAT ABOUT 50% OF ORGANIC MATERIALS COMPOSING WHOLE RAT HAD BIOLOGICAL HALF-LIVES EXCEEDING 100 DAYS, 4-MONTHS EXPOSURE OF 1ST GENERATION RATS NOT SUFFICIENT TO REACH H3 EQUILIBRIUM IN MORE INERT COMPONENTS. 72% OF COLLAGEN FRACTION HAD A HALF-LIFE OF 1,000 DAYS TO INFINITY, 72% OF BONE HALF-LIFE OF 240 DAYS, 3% OF LIVER 140 DA, 33% OF PHOSPHOLIPIDS 220 DA, ETC. CONTINUOUS LEVEL OF 3.7 UCI H3/ML OF BODY WATER GAVE MAX WHOLE-BODY DOSE RATE OF 1 RAD/DA. 20 TO 30% OF H OF MOST TISSUE COMPOUNDS WAS DERIVED FROM BODY WATER, BRAIN H NEARLY 40%, FATTY ACID H 10%. DYNAMIC COMPONENTS (FEW DAYS) CONSTITUTE SMALL % OF WHOLE ANIMAL.

INGESTION + OXIDE + WATER + DOSE CALCULATION, INTERNAL + EQUILIBRIUM + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + DISTRIBUTION + SPECIFIC ACTIVITY + RADIATION EXPOSURE, CHRONIC + PREGNANT + BONE + MAMMAL, RAT + DURATION, GENERATION + EGG + EMBRYO + *FAT + FETUS + GI TRACT + IMMATURE + KIDNEY + LIVER + LUNG + MATURE + MUSCLE + NEWBORN + STOMACH + FEMALE + RETENTION FUNCTION + BODY FLUID + *BRAIN + HEART + *YEAR

067133
PEAKE LR + WINDMUELLI HG + BIERI JG
COMPARISON OF INTESTINAL ABSORPTION, LYMPH AND PLASMA TRANSPORT, AND TISSUE UPTAKE OF ALPHA- AND GAMMA-TOCOPHEROLS IN RAT (T2788)
LABORATORY OF NUTRITION AND ENDOCRINOLOGY, MARYLAND
10 PAGES, 1 FIGURE, 3 TABLES, 29 REFERENCES, BIOCHIMICA ET BIOPHYSICA ACTA, VOL. 260, PP. 679-680 (1972)

CHEMICAL AS WELL AS PHYSICAL FORM MAY HAVE A SIGNIFICANT (FACTOR OF MORE THAN 3) EFFECT ON METABOLIC FACTORS SUCH AS BIOLOGICAL POTENCY OR % GI TRACT ABSORPTION OF AN INGESTED C14 OR H3 LABELED COMPOUND. PRESENT AUTHORS FOUND ABSORPTION OF GAMMA-TOCOPHEROL TO BE 15% LOWER THAN THE ALPHA FORM, BUT INITIAL SPLEEN UPTAKE FROM I.V. INJECTION WAS HIGHER FOR THE GAMMA. BIOL. POTENCY OF ALPHA/GAMMA IS 5 (HARROW, TEXT BIOCHEM,1962, P 480). GAMMA DIFFERS FROM ALPHA BY LACKING A METHYL GROUP IN POSITION 5 OF THE BENZENE RING. ALPHA-TOCOPHEROL TRITIATED IN 5-METHYL GROUP (A) AND GAMMA-TOCOPHEROL WITH C14 IN 3 AND 4 POSITIONS (B). 250 TO 300 GM RATS ON VITAMIN E-FREE DIET FOR 4 DA TO ELIMINATE ANY DIETARY TOCOPHEROL FROM DIGESTIVE TRACT. 100 UG OF LABELED TOCOPHEROL EMULSIFIED IN LARD OR CORN OIL WAS GIVEN BY STOMACH TUBE AND MESENTERIC LYMPH DUCT CANNULATED. 24-HR LYMPH ABSORPTION FOR LARD OR CORN OIL AVERAGED 45.7%. AT 0.5, 2.0, 24 HR PLASMA LEVELS OF (A) AND (B) RESPECTIVELY WERE 0.186,0.103 - 0.135,0.074 - 0.09,0.035 UG/ML, LIVER 1.09,0.95 - 0.71,0.62 - 0.15,0.07 - SPLEEN 0.32,0.43 - 0.22,0.22 - 0.17,0.10 UG/GM TISSUE FOR INJECTION OF 16 TO 18 UG OF (A) OR (B). ACCORDING TO GLOOR, HELV CHIM ACTA 49,2303(1966), (B) IS LOST FROM TISSUES FASTER THAN (A). UCI INTAKE NOT GIVEN IN PRESENT PAPER. MORE WORK NEEDED TO ASSESS MAGNITUDE OF CHEMICAL FORM EFFECTS ON METABOLISM OF RADIONUCLIDES.

BIOMEDICAL + CARBON + HYDROGEN + INGESTION + *ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + PHYSIOLOGY/METABOLISM + CONCENTRATION + *DISTRIBUTION + MAMMAL, RAT + EXPOSURE, IV + *FAT + *GI TRACT + LIVER + MATURE + *SPLEEN + ORGANIC + BLOOD, PLASMA + BLOOD, RBC + DISTRIBUTION, MICRO + HOUR + *PHYSICOCHEMICAL FORM

067143
HOLT LA + MILLIGAN B
LABELING OF PROTEINS BY IRRADIATION IN TRITIATED WATER (T2617B)
CSIRO, PARKVILLE, AUSTRALIA
8 PAGES, 3 FIGURES, 2 TABLES, 11 REFERENCES, BIOCHIMICA ET BIOPHYSICA, VOL. 264, PP. 432-439 (1972)

MERINO WOOL (A), SPERM-WHALE MYOGLOBIN (B), AND REDUCED CARBOXYMETHYLATED EGG-WHITE LYSOZYME (C) IN TRITIATED WATER (100 MCI/ML) IRRADIATED AT 20 C BY WAVELENGTHS OVER 295 NM FROM A 100-W HANOVIA MEDIUM-PRESSURE HG LAMP BECOME IRREVERSIBLY LABELED WITH TRITIUM, ESPECIALLY IN N2 ATMOS, WHICH MINIMIZES TRYPTOPHANE DESTRUCTION. 45% OF THE TRYPTOPHANE RESIDUES LABELED IN 2-POSITION WITH (A), 27% WITH (B), FOLLOWED BY TYROSINE, DISTRIBUTION IN OTHER POSITIONS NOT MEASURED. ENZYMIC (PRONASE, PROLIDASE, OR LEUCINE AMINOPEPTIDASE) RATHER THAN ACID HYDROLYSIS TO MINIMIZE TRYPTOPHANE DESTRUCTION AND TO MAXIMIZE LABELING SPECIFICITY. IRRADIATION PHOTOIONIZES TRYPTOPHANE, WHICH REVERTS BACK TO TRYPTOPHANE RESIDUES BY REACTION WITH WATER FOLLOWED BY ELECTRON CAPTURE (GROSSWEINER, PHOTOCHEM PHOTOBIOL 13,195(1971)). IRRADIATION OF WOOL IMPREGNATED WITH TRITIATED WATER IN THE PRESENCE OF O2 CAUSES CONSIDERABLE DESTRUCTION OF ITS TRYPTOPHANE RESIDUES AND LITTLE RADIOACTIVITY INCORPORATION INTO THE TRYPTOPHANE, TYROSINE, PHENYLALANINE, HISTIDINE, CRYSTINE RESIDUES OF THE PROTEIN MOLECULES, HALF THE TOTAL RADIOACTIVITY PRESENT BEING ASSOCIATED WITH A YELLOW COMPONENT IN THE HYDROLYSATE NOT RETAINED BY TYPE-C TECHNICON CHROMOBEADS, OF CONSIDERABLE INTEREST RELATIVE TO UNDESIRABLE YELLOWING OF WOOL

067143 *CONTINUED*
IN SUNLIGHT.

CHROMATOGRAPHY + OXIDATION + OXIDE + OXYGEN + RADIATION DAMAGE + ANALYTICAL TECHNIQUE + SPERM + *RADIOBIOLOGY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOCHEMICAL + PHYSIOLOGY/METABOLISM + RADIATION EFFECT, AGRICULTURAL + AMINO ACID + MAMMAL, LARGE + HAIR + MUSCLE + *PROTEIN + RESEARCH, INDUSTRY + *ULTRAVIOLET + INDUSTRY, UTILITY + EFFECT, DOSE + MODEL, PHYSICAL

067165
SEREBRYAKOV NG + CHIRKOVA EN
TISSUE DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE TO RABBITS
AFC-TR-7303 +. 6 PAGES, 1 FIGURE, 3 TABLES, 15 REFERENCES, RADIOBIOLOGIYA, VOL. 11, PP. 438-443 (1972) (T7780)

AUTHORS BELIEVE HAZARD OF TRITIUM LOCALIZED IN DRY PHASE OF TISSUE IS GREATER THAN THAT DISPERSED THROUGHOUT THE WATER PHASE OF THE BODY. THE RATIO OF TOTAL ABSORBED DOSE FOR DRY COMPONENTS OF WHOLE ORGAN TO THAT FOR THE WHOLE ORGAN IS HIGHEST FOR BONE MARROW (16.90) AND ADRENALS (2.40), LIVER, SKELETAL MUSCLES, KIDNEYS, HEART MUSCLE, BLOOD, BRAIN AORTA BEING RESPECTIVELY 1.30, 0.98, 0.73, 0.63, 0.55, 0.51, 0.44. THE 59-DAY DOSES IN PRECEDING ORDER WERE CALCD TO BE FOR THE DRY COMPONENT (RESIDUE) OF ORGAN 4145, 3.7, 612, 4770, 62, 26, 461, 52, 1.7 RADS RESPECTIVELY, THE ADDNL DOSES 3 MONTHS AFTER CESSATION OF THE DAILY I.M. INJECTION OF 5 UCI/GM (HTO) BEING RESPECTIVELY 3600, 2.5, 249, 3802, 34, 14, 481, 36, 2.8. RADS/DAY WERE CALCD BY THE FORMULA A (1 - E (EXP -BT)) WITH A VALUES OF 5.54, 10.88, 10.68, 10.52, 10.66, 11.20, 11.42, 10.90, 10.82 AND B VALUES OF 0.256, 0.154, 0.161, 0.161, 0.169, 0.164, 0.159, 0.159, 0.159 RESPECTIVELY FOR ABOVE ORGANS IN ABOVE ORDER. THE % WATER (CF LAZARIS, BYUL EKSPERIM BIOL I MED 62,41(1966)) FOR THESE RESPECTIVELY ORGANS IS 37.8, 72.3, 75.5, 76.6, 80.4, 81.1, 83.2, 79.5, 79.0 AND CORRESPONDING % DRY RESIDUES THE DIFFERENCE FROM 100, FOR 3 KG MALE CHINCHILLA RABBITS (26 ANIMALS USED IN EXPT). CF CHIRKOVA, RADIOBIOLOGIYA 11,431(1971). MARROW 4% OF BODY WT, ADRENALS 0.012, LIVER 3.2, SKEL MUSCLES 42.0, ETC.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

OXIDE + HAZARD, RELATIVE + *WATER + *DOSE CALCULATION, INTERNAL + CRITICAL MASS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + DISTRIBUTION + BLOOD + MAMMAL, SMALL + BONE, MARROW + EXPONENTIAL FUNCTION + EXPOSURE, CHRONIC + EXPOSURE, IM + KIDNEY + LIVER + MATURE + MUSCLE + RBE + *DRY + MALE + *MASS + *ORGAN + *RETENTION FUNCTION + ADRENAL + BRAIN + MONTH

067798
STEWART ML + ROSENTHAL GM + KLINE JR
TRITIUM - DISCRIMINATION AND CONCENTRATION IN FRESH WATER MICROCOSMS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
CONF-710501-76 +. 29 PAGES, FROM 3RD NATIONAL SYMPOSIUM ON RADIOECOLOGY, OAK RIDGE, TENNESSEE, MAY 10, 1971

SNAILS WERE KEPT IN AQUARIA UP TO NINE MONTHS, AND TRITIUM UPTAKE WAS DESCRIBED BY AN EMPIRICAL MODEL. COMPARTMENTS AND RESIDENCE TIMES - EXTRACELLULAR UNBOUND WATER (80.3% OF THE UNBOUND WATER WITHIN THE SNAIL SHELL), FOUR MIN; CELLULAR UNBOUND WATER (19.7% OF THE UNBOUND WATER IN THE SNAIL SHELL), 330 MIN; CELLULAR BOUND TRITIUM (ACCOUNTING FOR 68% OF THE EXCHANGEABLE HYDROGEN), 2,650 MIN; EXTRACELLULAR BOUND TRITIUM (ACCOUNTING FOR 28% OF THE EXCHANGEABLE HYDROGEN), 8 MIN; SURFACE BOUND TRITIUM (DIRECTLY EXPOSED TO ENVIRONMENTAL TRITIUM ACCOUNTING FOR 4% OF THE EXCHANGEABLE HYDROGEN), 2 MIN. COMPARTMENTAL SIZES AND RATE TRANSFER COEFFICIENTS ARE GIVEN.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + PHYSIOLOGY/METABOLISM + *ANIMAL, AMPHIBIAN + CONCENTRATION FACTOR + MOLLUSC + MODEL, BIOLOGICAL

068619
GARNER RJ + COMAR CL
TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO ANIMALS AND MAN
COLORADO STATE UNIVERSITY, FORT COLLINS + CORNELL UNIVERSITY, ITHACA, NEW YORK
49 PAGES, CRITICAL REVIEWS IN ENVIRONMENTAL CONTROL, 2(3), PP. 337-385 (1971)

LITERATURE ON PATHWAYS OF RADIONUCLIDES TO THE BIOSPHERE IS REVIEWED SINCE PUBLICATION OF RADIOACTIVITY AND HUMAN DIET (R.S. RUSSELL, ED., 1966). I-131, SR-90, CS-137, OTHER MAN-MADE RADIONUCLIDES, AND NATURAL RADIONUCLIDES OF THE URANIUM AND THORIUM SERIES ARE DEALT WITH. A FIELD STUDY IS REQUIRED FOR AN ACCURATE ESTIMATE OF THE CONSEQUENCES OF ANY SPECIFIC CONTAMINATION EVENT. DOSE ESTIMATES (MREM/YR) ARE - AVERAGE TO THE WHOLE BODY FROM NATURAL SOURCES (79), INTERNAL FROM K-40 (20), INTERNAL FOR REINDEER-HERDING LAPPS FROM PO-210 (100), TO THE WHOLE BODY FROM THE NUCLEAR POWER PROGRAM BY THE YEAR 2000 FROM TRITIUM (0.06) AND FROM KR-85 (0.025).

BIBLIOGRAPHY + INGESTION + RADIATION IN PERSPECTIVE + HAZARD, RELATIVE + XENON + DIETARY HABIT + *DOSE CALCULATION, INTERNAL + CRITICAL NUCLIDE PATHWAY + *DOSE CALCULATION, EXTERNAL + RADIOACTIVITY RELEASE + RADIOISOTOPE + REVIEW + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + FOOD CHAIN + ECOSYSTEM, MODEL + MAN + WHOLE BODY

069396
CLEGG B + KORANDA J + HADLEY G
A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL VARIABLES
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-73373 + CONF-711111-20 +. 6 PAGES, 4 FIGURES, 7 REFERENCES, PAPER PRESENTED AT THE IEEE 1972 NUCLEAR SCIENCE SYMPOSIUM, SAN FRANCISCO, CALIFORNIA, NOVEMBER 3-5, 1971

LIKELY INCREASES OF ATOMIC POWER PRODUCTION WILL RESULT IN RELEASES OF MORE TRITIUM (3H) TO THE ENVIRONMENT. THIS LOW ENERGY BETA EMITTER HAVING A HALF-LIFE OF 12.4 YEARS IS AN INTERNAL BIOLOGICAL HAZARD. IN THE MOST COMMON BIOLOGICALLY IMPORTANT FORM OF TRITIATED WATER (THO), TRITIUM MOVES THROUGH THE BIOSPHERE ESSENTIALLY ALONG WATER PATHWAYS. KNOWLEDGE OF THESE PATHWAYS IN THE PREDICTABLE TERMS OF ENVIRONMENTAL CONDITIONS IS REQUIRED FOR CALCULATING THE RADIOLOGICAL HAZARD TO MAN. THE STUDY OF TRITIUM IN THE BIOSPHERE IS THEN ACTUALLY THE STUDY OF THE PROPERTIES OF WATER TRANSPORT THROUGH THE AIR-WATER, SOIL, PLANT INTERFACES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HAZARD, RELATIVE + TRACER, RADIOACTIVE + *ATMOSPHERIC POLLUTION + WATER + BETA EMITTER + *DOSE CALCULATION, EXTERNAL + *RADIATION SAFETY AND CONTROL + SOIL + RADIOACTIVITY RELEASE + *ENVIRONMENT + *VEGETATION + ECOSYSTEM, TROPICAL + *TRANSPORT + BIOLOGICAL CONTROL + TRANSPIRATION

069507
WALDEN SJ
EFFECTS OF TRITIATED WATER ON THE EMBRYONIC DEVELOPMENT OF THE THREE-SPINE STICKLEBACK
WASHINGTON UNIVERSITY, SEATTLE
NVO-269-12 +. 13 PAGES, 2 FIGURES, 1 TABLE, 10 REFERENCES, MAY 1971

NO MORPHOLOGICAL ANOMALIES OTHER THAN A REDUCTION IN EYE DIAMETER WERE OBSERVED BY HATCHING IN LAKE WATER CONTAINING 2 MILLICI/ML OF TRITIATED WATER. MODIFICATION OF THE APPARATUS MAY BE REQUIRED FOR HATCHING A SPECIES LESS TOLERANT TO LOW OXYGEN LEVELS AND HIGH CARBON DIOXIDE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

OXYGEN + CARBON DIOXIDE + *RADIONUCLIDE UPTAKE + *ANIMAL, FISH + LABORATORY EXPERIMENT + RADIATION EFFECT + SENSITIVITY ANALYSIS + *EMBRYO

069508
KORANDA JJ + MARTIN JR
MOVEMENT OF TRITIUM IN ECOLOGICAL SYSTEMS
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-73178 +. 56 PAGES, 16 FIGURES, 4 TABLES, 34 REFERENCES, AUGUST 24, 1971

THE WORLD-WIDE EXPOSURE FROM FISSION-PRODUCED TRITIUM BY THE YEAR 2000 (0.008 MILLIRAD) WILL BE SMALL. LOCAL EXPOSURES MAY BE SUBSTANTIALLY HIGHER, DEPENDING ON HOLDUP IN ECOSYSTEMS. TURNOVER OF TRITIATED WATER IN PLANTS, ANIMALS, AND ECOSYSTEMS IS REVIEWED. IMPORTANT FACTORS INCLUDE RATES OF TURNOVER OF SOIL WATER, HALF TIMES OF BODY OR TISSUE WATER (MINUTES-HOURS IN PLANTS, 1-15 DAYS IN ANIMALS), AND RATES OF ORGANIC FIXATION OF TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DILUTION + FALLOUT + *DOSE CALCULATION, INTERNAL + GROUND WATER, NUCLIDE OCCURRENCE + SOIL, NUCLIDE OCCURRENCE + SURFACE WATER, DISPOSAL MEDIA + WASTE DISPOSAL, LIQUID + CRITICAL NUCLIDE PATHWAY + *REVIEW + ENVIRONMENTAL CONTROL MEASURE + RADIONUCLIDE UPTAKE + ANIMAL + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + VEGETATION + RADIONUCLIDE TRANSFER + *ECOSYSTEM + ORGANIC

069935
HARRISON FL + KORANDA JJ + TUCKER JS
TRITIATION OF AQUATIC ANIMALS IN AN EXPERIMENTAL MARINE POOL
LAWRENCE LIVERMORE LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
UCRL-73116(REV.1) + CONF-710809-13 +. 36 PAGES, FIGURES, DECEMBER 10, 1971, PAPER PRESENTED AT TRITIUM SYMPOSIUM, LAS VEGAS, NEVADA, AUGUST 30, 1971.

TO OBTAIN DATA FOR A PREDICTIVE MODEL, THE RATE OF LOSS OF TRITIUM FROM MARINE ANIMALS (SEVERAL HUNDRED CLAMS, M. ARENARIA; 50 CRABS, C. PRODUCTUS; AND 50 FISH, G. MIRABILIS) COLLECTED FROM SAN FRANCISCO BAY WAS MEASURED AFTER ABOUT 100 DAYS EXPOSURE IN A CONTAMINATED (100,000 DIS/MIN, ML) POOL. THE MAXIMUM SPECIFIC ACTIVITY (T/H) ORGANICALLY BOUND IN TISSUES WAS LESS THAN 50% OF THAT IN SEAWATER. IN THE CASE OF THE CLAMS, HALF TIMES WERE OBTAINED BOTH FOR UPTAKE OF THE ORGANICALLY BOUND COMPONENT BY VARIOUS TISSUES (600-1400 DAYS) AND FOR LOSS (110-290 DAYS).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CRUSTACEAN + COMPARISON, THEORY AND EXPERIENCE + *ANALYTICAL MODEL + CRITICAL NUCLIDE PATHWAY + SIMULATION + FORECAST + RADIONUCLIDE UPTAKE + ANIMAL + BIOACCUMULATION/TURNOVER + FOOD CHAIN + LABORATORY EXPERIMENT + SPECIFIC ACTIVITY + *ECOSYSTEM, MARINE + CONCENTRATION FACTOR + *ECOSYSTEM, MODEL

070396
ANSPAUGH LR + KORANDA JJ + ROBISON WL + MARTIN JR
DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-73195 + CONF-71809-12 +. 31 PAGES, FROM THE TRITIUM SYMPOSIUM HELD IN LAS VEGAS, NEVADA, AUGUST 30, 1971

070396 *CONTINUED*

PAST EFFORTS TO PREDICT THE DOSE TO MAN AS A RESULT OF POSSIBLE FOOD-CHAIN CONTAMINATION FOLLOWING THE RELEASE OF THO VAPOR HAVE BEEN BASED UPON MODELS MORE APPROPRIATE FOR THE RELEASE OF RADIONUCLIDES WHICH DIFFER SUBSTANTIALLY FROM THO IN THE DYNAMICS AND PATHWAYS OF ECOLOGICAL TRANSPORT. FIELD STUDIES IN CONJUNCTION WITH PROJECT RULISON AND CONTROLLED EXPOSURE EXPERIMENTS INDICATE THAT SUCH MODELS OVERPREDICT THE DOSE TO MAN BY ORDERS OF MAGNITUDE. DATA FROM THESE AND OTHER PERTINENT EXPERIMENTS ARE USED TO DERIVE A MORE REALISTIC, SIMPLE MODEL WHICH MAY BE USED TO PREDICT THE DOSE TO MAN VIA INHALATION PLUS ABSORPTION AND VIA THE INGESTION OF VEGETABLES, MILK, AND MEAT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECOLOGY + DOSE + INGESTION + INHALATION + *MILK + CRITICAL NUCLIDE + *CRITICAL NUCLIDE PATHWAY + *WATER VAPOR + ABSORPTION + MODEL + CONCENTRATION + *FOOD CHAIN + *RADIATION EXPOSURE, ACUTE + *RADIATION EXPOSURE, CHRONIC + FOOD

071505
BENNETT BG
RADIATION DOSE DUE TO ACUTE INTAKE OF TRITIUM BY MAN
AEC, HEALTH AND SAFETY LABORATORY, NEW YORK OPERATIONS OFFICE
HASL-253 +. 17 PAGES, APRIL 1972

SMALL AMOUNTS OF TRITIUM ACQUIRED AS WATER BY MAN ARE INCORPORATED INTO TISSUE COMPOUNDS AND RETAINED CONSIDERABLY LONGER THAN THE 8-TO-10-DAY HALF-TIME ASSOCIATED WITH RETENTION IN THE BODY WATER. A REVIEW OF THE DATA FROM THE FEW LONG-TERM OBSERVATIONS OF HUMAN CASES OF EXPOSURE TO TRITIUM SHOWS THAT TWO BOUND COMPONENTS WITH RETENTION HALF-TIMES OF ABOUT 30 AND 450 DAYS CAN BE IDENTIFIED. A TWO-COMPARTMENT ESTIMATE AND THREE-COMPARTMENT-MODEL CALCULATIONS ARE MADE TO DETERMINE THE CONTRIBUTION TO THE TISSUE DOSE FROM TRITIUM IN THE BODY WATER AND IN THE BOUND COMPARTMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + *WATER + *DOSE CALCULATION, INTERNAL + MODEL + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + *HALF-LIFE, EFFECTIVE + EFFECT, AGE + *EXPOSURE, ACUTE + MAN + *RETENTION + BODY FLUID

072215
HOFER KG + HUGHES WL
RADIOTOXICITY OF INTRANUCLEAR TRITIUM, 125-IODINE AND 131-IODINE
THE OHIO STATE UNIVERSITY, COLUMBUS + TUFTS UNIVERSITY SCHOOL OF MEDICINE, BOSTON, MASSACHUSETTS
16 PAGES, 4 FIGURES, 26 REFERENCES, RADIATION RESEARCH, VOL. 47, PP. 94-109 (JULY 1971)

L1210 LEUKEMIA CELLS WERE LABELED WITH VARIOUS DOSES OF 125I-IODODEOXYURIDINE, 131I-IODODEOXYURIDINE, OR 3H-THYMIDINE AND INOCULATED INTO NEW, NONRADIOACTIVE HOSTS TO FACILITATE A QUANTITATIVE EVALUATION OF THE TOXIC EFFECTS RESULTING FROM THE INTRANUCLEAR DECAY OF THE THREE RADIOISOTOPES. INTRACELLULAR TRITIUM AND 131I PRODUCT ALMOST IDENTICAL EFFECTS. THE TWO RADIOISOTOPES, BOTH BETA EMITTERS, YIELD SURVIVAL CURVES WHICH ARE CHARACTERISTIC OF LOW-LET RADIATIONS. IN TERMS OF ENERGY ABSORPTION PER CELL, THE TOXIC MANIFESTATIONS FROM 125I EXCEED THE EFFECTS OF TRITIUM AND 131I BY A FACTOR OF 4 TO 5. IN SPITE OF A NARROW SHOULDER RESPONSE, THE 125I SURVIVAL CURVE RESEMBLES THE PATTERN OBSERVED WITH HIGH LET RADIATION.

*BIOMEDICAL + *IODINE + *RADIOBIOLOGY + RADIOSENSITIVITY + TOXICITY

073994
STEWART GL
TRITIUM IN PINE TREES FROM SELECTED LOCATIONS IN THE UNITED STATES, INCLUDING AREAS NEAR NUCLEAR FACILITIES
UNIVERSITY OF MASSACHUSETTS, AMHERST
7 PAGES, U. S. GEOLOGICAL SURVEY PROFESSIONAL PAPER NO. 800-B, PP. 265-271 (1972)

EXCLUDING SAMPLES NEAR THE NUCLEAR FACILITIES, THE TRITIUM CONCENTRATIONS IN PINE NEEDLES FOLLOWED A GEOGRAPHIC PATTERN SIMILAR TO THAT FOR THE RAINOUT OF BOMB-PRODUCED TRITIUM--A GENERAL INCREASE WITH LATITUDE AND DISTANCE FROM THE OCEAN. HOWEVER, TRITIUM CONCENTRATIONS WERE GREATER IN PLANT TISSUE THAN WOULD BE EXPECTED FROM NATURAL RAINOUT. AT THE SAVANNAH RIVER PLANT, SOUTH CAROLINA, THE DATA CLEARLY INDICATE A DECREASING CONCENTRATION OF TRITIUM WITH DISTANCE FROM THE RELEASE AREAS.

RAINOUT + MONITOR, ENVIRONMENTAL + *SAVANNAH RIVER PLANT + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + *PLANT, SPERMATOPHYTE + *ECOSYSTEM, FOREST

074536
KIRCHMANN R + VAN DEN HOEK J
TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN
CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE, MOL, BELGIUM
10 PAGES, J. BELGE RADIO., 55(2), PP. 233-242 (1972)

TRITIUM IN THE ENVIRONMENT ORIGINATES FROM NATURAL AND ARTIFICIAL SOURCES: THE NATURAL PRODUCTION RATIO (INTERACTION, COSMIC RAYS ON NITROGEN AND OXYGEN IN THE AIR) AND THE ARTIFICIAL PRODUCTION RATIO (NUCLEAR BOMB EXPLOSIONS, POWER REACTORS) ARE INDICATED. DATA ON THE MOVEMENT OF TRITIUM IN THE ENVIRONMENT AND ESTIMATES OF TRITIUM PRODUCTION AND RELEASE BY NUCLEAR INSTALLATIONS ARE GIVEN AND BRIEFLY COMMENTED ON. THE WAYS IN WHICH PLANT-LIFE IS CONTAMINATED

074536 *CONTINUED*
ARE NUMEROUS (ABSORPTION BY ROOT OR LEAF, VAPOUR EXCHANGE) AND THE MECHANISM RESPONSIBLE FOR TRITIUM INCORPORATION IN PLANT ORGANIC MATTER IS THAT OF PHOTOSYNTHESIS.

*POPULATION EXPOSURE + CONTAMINATION + RADIOACTIVITY RELEASE + *ABSORPTION + *RADIONUCLIDE UPTAKE + CONCENTRATION + *FOOD CHAIN + *RADIONUCLIDE TRANSFER + VAPOR EXCHANGE

075246
RUDOLPH AW + CARROLL TF + DAVIDSON RS
TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY
BATTELLE COLUMBUS LABORATORIES, OHIO
BMI-171-302 +. 250 PAGES, FIGURES, TABLES, REFERENCES, JUNE 30, 1971

THIS BIBLIOGRAPHY WAS COMPILED TO PROVIDE DETAILED SUBJECT ACCESS TO THE LITERATURE ON TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT, WITH EMPHASIS ON MAN. THE ABSTRACTS ARE, FOR THE MOST PART, OF THE INDICATIVE TYPE -- INTENDED TO DESCRIBE THE CONTENT OF THE REFERENCES WITHOUT RELATING SPECIFIC DETAILS. ALL INDEX TERMS ASSOCIATED WITH EACH ARTICLE ARE LISTED IN THE COMPILATION IMMEDIATELY FOLLOWING THE ABSTRACT. TO PROVIDE ACCESS TO THE CONTENTS OF THE COMPILATION, A SUBJECT, AUTHOR, AND REPORT-NUMBER INDEX ARE PROVIDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIBLIOGRAPHY + *BATTELLE NORTHWEST + ENVIRONMENT + *RADIATION EFFECT + RADIATION EXPOSURE + *MAN + REPORT, ENVIRONMENTAL

075281
MOSKALEV YI
TRITIUM OXIDE
AEC-TR-7298 +. 363 PAGES, FIGURES, TABLES, REFERENCES, 1968

A MONOGRAPH GENERALIZING EXTENSIVE THEORETICAL AND EXPERIMENTAL MATERIAL ON THE DISTRIBUTION, KINETICS OF EXCHANGE, AND BIOLOGICAL ACTION OF TRITIUM OXIDE. THE MODERN DATA ON THE PHYSICAL PROPERTIES OF DEUTERIUM AND TRITIUM, THE ISOTOPIC EXCHANGE OF HYDROGEN, THE KINETICS OF ISOTOPIC EXCHANGE, METHODS FOR MEASURING TRITIUM IN BIOLOGICAL MEDIA, THE KINETICS OF WATER EXCHANGE IN THE ANIMAL AND HUMAN ORGANISM, PATHWAYS AND RATES OF ASSIMILATION OF TRITIUM OXIDE THROUGH THE GASTROINTESTINAL TRACT, LUNGS, AND SKIN, AND THE KINETICS OF THE ELIMINATION OF TRITIUM OXIDE FROM THE ANIMAL AND HUMAN ORGANISM ARE ANALYZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIOMEDICAL + DEUTERIUM + HYDROGEN + MEASUREMENT + *OXIDE + *CRITICAL NUCLIDE PATHWAY + ION EXCHANGE + *PROPERTY, PHYSICAL + ANIMAL + ASSIMILATION + *DISTRIBUTION + ELIMINATION + GI TRACT + LUNG + MAN + SKIN + *BIOLOGICAL CONTROL + *METABOLIC KINETICS

075309
ANTONELLI A + BOMBACE MA + CIGNA AA + CIGNA R + LANERI U
RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE EURFX NUCLEAR PLANT
CNEN, DIV. NE PROT. SAN. F CONTROLLI AND LB. RADIOATTIVITA AMBIENTALE, ROME, ITALY
44 PAGES, 1 FIGURE, 1 TABLE, 8 REFERENCES, PRESENTED AT THE SYMPOSIUM ON RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT, ROME, SEPTEMBER 1972

TRACER EXPERIMENTS WERE CONDUCTED OF MIXING IN THE DORA BALTEA RIVER AND OF THE PO RIVER DOWNSTREAM OF ITS CONFLUENCE WITH THE DORA. ESTIMATES WERE MADE OF RADIONUCLIDE PATHWAYS TO MAN VIA DRINKING WATER, IRRIGATION WATER (THROUGH VEGETABLES AND MILK), AND FISH CONSUMPTION. MAXIMUM RELEASE RATES (FOR TRITIUM, MN, FE, CO, ZN, SR, RU, CS, CE, AND PU RADIONUCLIDES) ARE LISTED WHICH ENSURE A WIDE SAFETY MARGIN, AND IT IS SHOWN THAT IN ALL CASES DRINKING WATER IS THE MORE CRITICAL PATHWAY.

AVAILABILITY - OFFICE FOR OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES, P.O.B. 1003, LUXEMBOURG 1

CESIUM + COBALT + CONCENTRATION, MAXIMUM + EURATOM + PLUTONIUM + RUTHENIUM + STRONTIUM + MANGANESE + WASTE DISPOSAL, RIVER + ZINC + MILK + DIETARY HABIT + DOSE CALCULATION, INTERNAL + *WATER, DRINKING + IRON + CRITICAL NUCLIDE PATHWAY + ITALY + WATER, IRRIGATION + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + *FOOD CHAIN + FIELD EXPERIMENT + ECOSYSTEM, MODEL

075319
VAN DEN HOEK J + KIRCHMANN R
TRITIUM SECRETION INTO COW'S MILK AFTER ADMINISTRATION OF ORGANICALLY BOUND TRITIUM AND OF TRITIATED WATER
WAGENINGEN AGRICULTURAL UNIVERSITY, THE NETHERLANDS + S.C.K.-C.E.N., MOL, BELGIUM, DEPARTMENT OF RADIOBIOLOGY
12 PAGES, 3 FIGURES, 2 TABLES, 6 REFERENCES, PRESENTED AT THE COMMISSION OF THE EUROPEAN COMMUNITIES INTERNATIONAL SYMPOSIUM ON RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT, ROME, SEPTEMBER 1971

TRITIUM (A POTENTIAL POLLUTANT FROM THE NUCLEAR INDUSTRY WHICH MAY ENTER FOOD CHAINS THROUGH UPTAKE BY PLANTS) WAS ADMINISTERED TO LACTATING COWS AS TRITIATED ORGANIC CONSTITUENTS IN HAY WHICH HAD BEEN CONTAMINATED DURING GROWTH. THE BIOLOGICAL HALF-LIFE OF TRITIUM IN ORGANIC MILK CONSTITUENTS WAS ABOUT TWO DAYS INITIALLY, BUT MUCH SLOWER COMPONENTS BECAME PREDOMINANT AFTER ABOUT ONE WEEK. PROBABLY THIS RESULTS FROM SLOW TURNOVER OF TRITIUM WHICH BECOMES INCORPORATED INTO THE ANIMAL'S TISSUES.

075319 *CONTINUED*
AVAILABILITY - OFFICE FOR OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES, P.O.B. 1003, LUXEMBOURG 1

*MILK + CRITICAL NUCLIDE PATHWAY + NETHERLANDS + ECOSYSTEM, GRASSLAND + *RADIONUCLIDE UPTAKE + BIOLOGICAL HALF-LIFE + FOOD CHAIN + SYSTEM ANALYSIS + RETENTION + FOOD INTAKE + ORGANIC

075321
WOODHEAD DS
LEVELS OF RADIOACTIVITY IN THE MARINE ENVIRONMENT AND THE DOSE COMMITMENT TO MARINE ORGANISMS
MINISTRY OF AGRICULTURE, LOWESTOFT, SUFFOLK, ENGLAND
IAEA-SM-158/31 +. 34 PAGES, 2 FIGURES, 15 TABLES, 63 REFERENCES, PRESENTED AT THE SYMPOSIUM ON THE INTERACTION OF RADIOACTIVE CONTAMINANTS WITH THE CONSTITUENTS OF THE MARINE ENVIRONMENT, SEATTLE, WASHINGTON, JULY 10-14, 1972

DATA IS REVIEWED ON SEA-WATER AND SEA-BED RADIOACTIVITY; AND, BASED ON IDEALIZED MODELS, DOSE RATES (MICRORADS/HOUR) ARE CALCULATED FOR FIVE GROUPS OF MARINE BIOTA (1) PHYTOPLANKTON, (2) ZOOPLANKTON, (3) MOLLUSCA, (4) CRUSTACEA, AND (5) FISH). VALUES ARE OBTAINED FOR - (A) NATURAL SOURCES OF RADIOACTIVITY - (1) 2.8-8.2, (2) 3.3-16.4, (3) 9.5-31.5, (4) 10.0-38.0, (5) 3.3-20.8; (B) FALLOUT - (1) 0.26-24.5, (2) 1.4-147, (3) 0.10-8.0, (4) 0.36-0.46, (5) 0.14-42.7; (C) WASTE DISPOSAL OPERATIONS IN THE WINDSCALE PROCESSING PLANT VICINITY - (1) 200-2200, (2) 530-6900, (3) 51.8-3400, (4) 43.3-3410, (5) 0.6-3340. IN THE CASE OF SR-90, CS-137, H-3, C-14 AND PU-239, FOR WHICH THERE ARE EXTENSIVE DATA, APPROXIMATE TISSUE LEVELS CAN BE DERIVED USING THE APPROPRIATE CONCENTRATION FACTORS.

AVAILABILITY - UNIPUB INC., P.O. BOX 433, NEW YORK, N.Y. 10016

CARBON + CESIUM + OCEAN AND SEA + PLUTONIUM + STRONTIUM + UNITED KINGDOM + WASTE DISPOSAL, OCEAN + DOSE CALCULATION, INTERNAL + CRITICAL NUCLIDE PATHWAY + WINDSCALE + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + PHYTOPLANKTON + ZOOPLANKTON + ASSIMILATION + BIOACCUMULATION/TURNOVER + FOOD CHAIN + MARINE ORGANISM + *RADIATION EFFECT, ECOSYSTEM + *ECOSYSTEM, MARINE + ECOSYSTEM, MODEL + MOLLUSC + ECOSYSTEM, ESTUARINE

077006
ISOTOPE STUDIES ON THE PHYSIOLOGY OF DOMESTIC ANIMALS (HPIS/133)
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB-309 +. 419 PAGES, FIGURES, SEPTEMBER 1972

ANIMAL PRODUCTION UNDER DIFFERENT ENVIRONMENTAL CONDITIONS SUCH AS TEMPERATURE IS OF GROWING CONCERN FOR DEVELOPING COUNTRIES WHERE TRACER WORK ON ENVIRONMENTAL PHYSIOLOGY, DIGESTIVE METABOLISM, ETC., IS STILL IN INITIAL STAGES OF DEVELOPMENT. PRESENT SYMPOSIUM CONSISTS OF ORIGINAL AND REVIEW ARTICLES GROUPED AS FOLLOWS - (1) BODY COMPOSITION, (2) ENVIRONMENTAL PHYSIOLOGY, (3) ENDOCRINOLOGY, (4) DIGESTIVE PHYSIOLOGY AND METABOLISM. SEE E.G. HPIS/134 FOR DIETARY INTAKE, WHOLE-BODY RETENTION CURVE IN COW FROM 1 TO 30 DAYS FOR NA-22, OR HPIS/135 FOR ORAL VS I.V. FECAL EXCRETION OF MN-54 BY PIG, COW, SHEEP + MATERNAL AND FETAL TISSUE DISTRIBUTIONS, OR IN-VIVO NUCLEAR TECHNIQUES FOR DETERMINING BODY COMPOSITION OF PIG, COW, SHEEP (HPIS/137).

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

CALCIUM + INGESTION + IODINE + SODIUM + TRACER, RADIOACTIVE + *AGRICULTURE + CHROMIUM + MANGANESE + PHOSPHORUS + SULFUR + ANALYTICAL TECHNIQUE + ENVIRONMENT + BROMINE + *UNITED NATIONS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *PHYSIOLOGY/METABOLISM + CONCENTRATION + EXCRETION + DISTRIBUTION + TEMPERATURE + PRODUCTION, RATE + MAMMAL, LARGE + FETUS + GI TRACT + RETENTION + BENEFICIAL USE, AGRICULTURE + MAMMAL, COW + MAMMAL, PIG + *FOOD

077191
MOGHISSI AA + CARTER MW
TRITIUM
807 PAGES, PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

'TRITIUM' IS BASED ON A SYMPOSIUM HELD FROM AUGUST 30 THROUGH SEPTEMBER 2, 1971, IN LAS VEGAS, NEVADA, AND COSPONSORED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA, LAS VEGAS. THE ORGANIZERS ATTEMPTED TO COVER THE ENTIRE SUBJECT, ALTHOUGH PRIMARY EMPHASIS WAS PLACED ON THE ENVIRONMENTAL ASPECTS OF TRITIUM. THE BOOK IS DIVIDED INTO TEN CHAPTERS COVERING THE HISTORY, PRODUCTION, MEASUREMENT, BIOLOGICAL EFFECTS AND KINETICS, ENVIRONMENTAL ASPECTS, APPLICATION AND HEALTH PHYSICS OF TRITIUM.

CONTAINMENT + EFFLUENT + MEASUREMENT + *PLOWSHARE + HAZARD, RELATIVE + *WASTE TREATMENT + *TEST, WEAPONS + *REACTOR, POWER + MONITOR, ENVIRONMENTAL + *NUCLEAR DETONATION + RADIOACTIVITY RELEASE + ENVIRONMENT + DATA COLLECTION + *PRODUCTION + RADIATION EFFECT + BIOLOGICAL CONTROL + *SOCIO/PHILOSOPHICAL CONSIDERATION + HPIS

077200
WESTON PE
KINETICS OF TRITIUM IN BIOLOGICAL SYSTEMS
BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK
92 PAGES, PP. 289-381 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

CHAPTER FIVE OF 'TRITIUM' DEALS WITH TOPICS SUCH AS KINETIC AND EQUILIBRIUM EFFECTS OF TRITIUM SUBSTITUTION, DISTRIBUTION OF TRITIUM BETWEEN THE HYDROSPHERE AND INVERTEBRATES, TRITIUM BIOKENETICS, TRITIUM TURNOVER RATES IN MAMMALS, EXCRETION IN MAN AND DESERT MAMMAL, FOOD CHAIN

077200 *CONTINUED*
CONTAMINATION, EXCRETION VIA COW'S MILK, BIOLOGICAL IMPLICATIONS OF TRITIATED LUMINOUS COMPOUNDS, TRITIATION OF AQUATIC ANIMALS, AND BEHAVIOR OF TRITIUM IN FISH.

ECOLOGY + *DOSE + *WATER + *AIR + MILK + POPULATION EXPOSURE + HAZARDS ANALYSIS + CHEMICAL KINETICS + CHEMICAL EQUILIBRIUM + *ANIMAL, INVERTEBRATE + ANIMAL, FISH + BIOACCUMULATION/TURNOVER + BIOLOGICAL HALF-LIFE + FOOD CHAIN + AQUATIC ORGANISM + EXCRETION + *DISTRIBUTION + LUMINARY + *MAN + BIOLOGICAL CONTROL + *METABOLIC KINETICS + HPIS

078468
PATZER RG + MOGHISSI AA + PLOTT WF, ET AL.
TRITIUM TRANSFER TO FOOD ITEMS FROM TRITIATED METHANE USED FOR DOMESTIC COOKING
ENVIRONMENTAL PROTECTION AGENCY, WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS
7 PAGES, 4 TABLES, 3 FIGURES, 4 REFERENCES, HEALTH PHYSICS, 23(4), PP. 501-507 (OCTOBER 1972)

VARIOUS FOODS WERE COOKED WITH TRITIATED METHANE AND ANALYZED FOR TRITIUM IN THE AQUEOUS AND DRY PORTIONS OF THE FOOD. THE AMOUNT OF TRITIUM FOUND IN THE FOOD WAS DIRECTLY RELATED TO EXPOSED SURFACE AREA, COOKING TIME, AND MOISTURE CONTENT OF THE FOOD. THE SPECIFIC ACTIVITY OF HYDROGEN WAS HIGHER IN SURFACE THAN IN INTERIOR PORTIONS OF COOKED FOOD, E.G., THE SPECIFIC ACTIVITY IN SURFACE AND CENTER PORTIONS OF MEAT LOAF WERE ABOUT 1 AND 0.3%, RESPECTIVELY, OF THE SPECIFIC ACTIVITY IN METHANE COOKING GAS. APPROXIMATELY 0.5% OF THE TRITIUM IN THE METHANE USED TO COOK A BEEF ROAST WAS FOUND IN THE ROAST. THE UPTAKE RATE OF TRITIUM INTO BEEF ROAST DURING COOKING CORRESPONDS TO AN UPTAKE RATE OF ABOUT 2 MICROGRAMS/(CM2-MIN) OF HYDROGEN FROM THE METHANE.

*CONTAMINATION + GAS + FUEL, FOSSIL + *RADIONUCLIDE TRANSFER + *FOOD + ENVIRONMENTAL PROTECTION AGENCY (EPA)

079184
BLAYLOCK, BG + ULRIKSON GU + PITT WW + ET. AL
APPLIED AQUATIC STUDIES
ORNL-4848 +. 7 PAGES, FIGURES, TABLES,
PP. 79-85, FEBRUARY 1973OAK RIDGE NATIONAL LABORATORY, TENNESSEE

STUDIES INCLUDE DEPTH DISTRIBUTION IN GAMMA ACTIVITY (62-86% CS137) IN THE SEDIMENT OF A HOLDING POND AS A RESULT OF DECREASED RADIOACTIVITY OF WASTE-WATER DISCHARGES, BIOLOGICAL HALF-LIVES FOR ELIMINATION OF TRITIUM FROM FISH KEPT IN THE POND FOR 36 DAYS, SEARCH (NEGATIVE) FOR CHROMOSOMAL POLYMORPHISM OF A NATURAL POPULATION OF INSECT LARVAE (C. TENTANS) OF THE POND DURING 1960-1973, SURVIVAL TIME AS A FUNCTION OF TEMPERATURE OF CATFISH THAT RECEIVED A 1500-RAD DOSE, EFFECT OF 1-10 PPM CD ON THE HATCHING TIME OF FISH EGGS, APPLICATION OF A CL-36 TRACER-GAS CHROMATOGRAPHIC METHOD TO DETECTION OF CHLORINATED ORGANICS PRODUCED DURING CHLORINATION PURIFICATION OF NATURAL WATERS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + *WASTE DISPOSAL, TERRESTRIAL + WASTE HANDLING + WASTE TREATMENT, LIQUID + WASTE DISPOSAL, RIVER + WATER, DRINKING + SOIL, NUCLIDE OCCURRENCE + CRITICAL NUCLIDE PATHWAY + WATER TREATMENT + CHLORINE + WATER QUALITY + SOIL PROPERTY, IN SITU + EFFECT + *RADIONUCLIDE UPTAKE + *ANIMAL, FISH + BIOLOGICAL HALF-LIFE + CHROMOSOMAL EFFECT + ECOSYSTEM, AQUATIC + SEDIMENT + LETHAL DOSE + TEMPERATURE + RADIATION EFFECT + CONCENTRATION FACTOR + EGG + WASTE, SEWAGE + LARVA

080624
TEMPLETON WL + VANDERHORST JR + ROBERTSON DE
MARINE SCIENCES
BATTELLE PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
BNWL-1759 (VOL. 1, PT. 2) +. 8 PAGES, 5 FIGURES, 10 REFERENCES, SECTION 3, MARCH 1973

EFFECTS FROM CANAL DISCHARGE OF POWERPLANT COOLING WATER WERE ASSESSED IN TWO TYPES OF EXPERIMENTS: (1) LETHAL TEMPERATURES (28-31 DEGREES) WERE DETERMINED FOR VARIOUS RATES OF HEATING OF MARINE FISH (0.2-2 DEGREES/MIN) COLLECTED NEAR SHORE AND ACCLIMATED TO 10 DEGREES, AND (2) LETHAL EXPOSURE TIMES (10-100 MIN) WERE DETERMINED AT 26-30 DEGREES. OYSTER EGGS WERE EXPOSED FOR 48 HR IN SEAWATER CONTAINING 0.01-1 MICROCURIE/ML OF TRITIUM (THE CALCULATED DOSE WAS 0.003R-0.54 RADS). THERE WAS NO EFFECT ON EGG DEVELOPMENT. BATTELLE-NORTHWEST PARTICIPATION IN THE GEOCHEMICAL OCEAN SECTIONS STUDY IS REVIEWED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BATTELLE NORTHWEST + BULGARIA + CANAL + *THERMAL POLLUTION + ANIMAL, FISH + MARINE ORGANISM + RADIATION EFFECT + MOLLUSC + *ECOSYSTEM, ESTUARINE + EGG + OCEAN, PACIFIC + DISCHARGE

081340
STRAND JA + BECKER CD + TEMPLETON WL
FRESHWATER ECOLOGY
BATTELLE PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
BNWL-1750 (VOL. 1, PT. 2) +. 26 PAGES, 10 TABLES, 10 FIGURES, 11 REFERENCES, SECTION 6, MARCH 1973

UPTAKE OF TRITIUM FROM 1 MICROCURIE/LITER OF TRITIATED WATER SOLUTION REACHED A MAXIMUM IN ABOUT 5 MONTHS IN TISSUES OF MOST AQUATIC ORGANISMS. ORGANICALLY BOUND TRITIUM WAS 7-21% OF THE TOTAL IN MUSSEL, CRAYFISH, CARP, AND FILAMENTOUS ALGAE; 4-12% IN EMERGENT VEGETATION. ONE MONTH AFTER TERMINATION OF THE EXPERIMENT, ONLY TRACE ACTIVITIES WERE MEASURED IN MOST TISSUES, BUT 30-40% OF THEIR LABEL WAS RETAINED BY FILAMENTOUS ALGAE AND EMERGENT VEGETATION; AFTER 8 MONTHS, 10% WAS

081340 *CONTINUED*
RETAINED BY VEGETATION. THE IMMUNE CAPACITY OF JUVENILE AND YEARLING RAINBOW TROUT AGAINST A NATURALLY OCCURRING BACTERIAL ANTIGEN WAS SUPPRESSED FOLLOWING TRITIUM IRRADIATION DURING EMBRYOGENESIS. COMBINED EFFECTS OF TEMPERATURE AND OTHER ENVIRONMENTAL STRESSES ON FISH AND INVERTEBRATES WERE STUDIED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*CRITICAL NUCLIDE PATHWAY + BATTELLE NORTHWEST + HANFORD SITE + THERMAL POLLUTION + RADIONUCLIDE UPTAKE + ANIMAL, INVERTEBRATE + ANIMAL, FISH + *ECOSYSTEM, AQUATIC + FOOD CHAIN + AQUATIC ORGANISM + *RADIATION EFFECT, ECOSYSTEM + RADIATION EFFECT + IMMUNOLOGY + DISEASE

081542
D'SOUZA TS + KIRCHMANN R + LEHR JJ
ANNUAL SCIENTIFIC REPORT 1971, CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE, MOL (BELGIUM)
CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE, MOL, BELGIUM
EURFNR-1063 +. 11 PAGES, 2 TABLES, PP. 55-58 (SECT. 3), 1-7 (SECT 4), 1972

AFTER CONTAMINATION OF PASTURES BY RU106 AS CHLORIDE, FIXATION ON ORGANIC AND FINE-MINERAL SOIL FRACTIONS AT 0-5 CM DEPTH WAS GREATER THAN BY SAND AT LOWER DEPTH. SOIL WATER COLLECTED IN LYSIMETERS DID NOT CHANGE IN RU106 ACTIVITY WITH DEPTH. UPTAKE OF SR85 BY PLANTS INCREASED WITH INCREASING ORGANIC MATTER IN SOILS, AND DECREASED WITH INCREASING CLAY. MILK FROM COWS FED WITH HAY FROM CONTAMINATED PASTURES WAS 10-20 TIMES HIGHER IN TRITIUM AS COMPARED WITH COWS GIVEN TRITIATED WATER. STUDIED THE UPTAKE OF TRITIUM BY MARINE ALGAE, ALSO THE UPTAKE OF MN54 AND CO60 BY FRESHWATER FISH, MOSS, AND SEDIMENT; THE UPTAKE OF VARIOUS RU SALTS BY FRESHWATER ORGANISMS WAS INVESTIGATED AS WELL. PILOT-PLANT-SCALE STUDIES WERE MADE OF NUCLEAR WASTE DECONTAMINATION BY ION EXCHANGE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COBALT + MONITOR, PERSONNEL + PLUTONIUM + RUTHENIUM + SOIL, RADIONUCLIDE MOVEMENT THROUGH + *STRONTIUM + ANIMAL FEED + *WASTE TREATMENT + BELGIUM + MANGANESE + MILK + *CRITICAL NUCLIDE PATHWAY + ION EXCHANGE + ECOSYSTEM, GRASSLAND + RADIONUCLIDE UPTAKE + ANIMAL, FISH + ECOSYSTEM, AQUATIC + FOOD CHAIN + AQUATIC ORGANISM + SEDIMENT + MARINE ORGANISM + ECOSYSTEM + PLANT, ALGAE/FUNGI + PLANT, MOSS/FERN

082345
HAKONSON TE + JOHNSON LJ + PURTYMUN WD
THE APPLICABILITY OF THE HONEYBEE AS AN INDICATOR OF ENVIRONMENTAL RADIOCONTAMINATION
LOS ALAMOS SCIENTIFIC LABORATORY
PAPER NO. 104 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973

HIVES OF BEES WERE PLACED NEAR THE OUTFALLS OF THREE LIQUID WASTE TREATMENT FACILITIES AT THE LABORATORY, WHERE THE BEES HAD ACCESS TO WATER AND VEGETATION WHICH WERE POTENTIALLY CONTAMINATED WITH VARIOUS RADIONUCLIDES. CESIUM-137 WAS UNMEASURABLE IN ANY OF THE 150 BEE AND HONEY SAMPLES EVEN THOUGH LEVELS OF THIS NUCLIDE IN EFFLUENT WATER WERE AS HIGH AS 1000 PCI/LITER. PLUTONIUM AND AMERICIUM LEVELS IN BEES, HONEY, AND EFFLUENT WATER WERE READILY DETECTABLE. LEVELS OF TRITIUM IN BEE SAMPLES ROSE FROM ABOUT 1 PCI/ML IN PRE-EXPERIMENT BEE SAMPLES TO A MAXIMUM OF 9600 PCI/ML, 250 PCI/ML, AND 560 PCI/ML IN THREE CANYONS. THE CORRESPONDING H-3 MAXIMUMS IN EFFLUENT WATER WERE 230 PCI/ML, AND 1.2 PCI/ML, RESPECTIVELY. THE TRITIUM LEVELS IN HONEY CLOSELY PARALLED THE DATA FOR THE BEES.

AVAILABILITY - WILLIAM D. PURTYMUN, LOS ALAMOS SCIENTIFIC LABORATORY, LOS ALAMOS, NEW MEXICO 87544

CESIUM + ECOLOGY + PLUTONIUM + *WATER + LASL + *CONTAMINATION + CONCENTRATION + *RADIATION EFFECT, SPECIES + *INSECT + *BIOLOGICAL CONTROL + *FOOD + HPIS

082373
CASARETT AP + MORGAN RA
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM ON PREIMPLANTATION MOUSE EMBRYOS
CORNELL UNIVERSITY
PAPER NO. 132 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (SEE - CONF-730603--1)

TWO CELL MOUSE EMBRYOS WERE GROWN IN VITRO IN CHEMICALLY DEFINED MEDIA CONTAINING TRITIUM OXIDE. ACTIVITY LEVELS RANGED FROM 10 TO 3000 MICROCURIES/ML. WITH DEVELOPMENT TO BLASTOCYST AS THE END POINT, THE LD50 WAS DETERMINED TO BE 450 MICROCURIES/ML, AN ACTIVITY CORRESPONDING TO A CALCULATED DOSE RATE OF 115 RADS PER DAY, OR A TOTAL EFFECTIVE DOSE FOR THE CULTURE PERIOD OF 288 RADS. SIMILAR EMBRYOS WERE EXPOSED IN VITRO TO CHRONIC GAMMA RADIATION FROM COBALT-60 DURING THE SAME PERIOD OF DEVELOPMENT. THE COMPARABLE LD-50 VALUES FOR DOSE RATE AND EFFECTIVE DOSE WERE 100 RADS PER DAY OR 250 RADS TOTAL DOSE. OTHER EMBRYOS DEVELOPED, IN VIVO, IN FEMALE MICE WHOSE BODY WATER CONTAINED TRITIUM OXIDE AT LEVELS OF 25 TO 500 MICROCURIES/ML. THE LD-50 WAS DETERMINED TO BE 900 MICROCURIES/ML, CORRESPONDING TO A DOSE RATE OF 250 RADS PER DAY OR A TOTAL EFFECTIVE DOSE OF 414 RADS. EXPOSURE OF EMBRYOS IN VIVO TO CHRONIC GAMMA RADIATION RESULTED IN AN EFFECTIVE LD-50 OF 396 RADS, AT A DOSE RATE OF 220 RADS PER DAY. IT IS CONCLUDED, THAT THE RBE OF TRITIUM FOR THESE EXPERIMENTAL CONDITIONS IS ONE.

AVAILABILITY - ALISON P. CASARETT, NEW YORK STATE VETERINARY COLLEGE, CORNELL UNIVERSITY, ITHACA, NEW YORK 14850

BIOMEDICAL + COBALT + DOSE + *OXIDE + *LETHAL DOSE + *RADIATION EXPOSURE + MAMMAL, MOUSE + EFFECT, DOSE RATE +

082373 *CONTINUED*
*EMBRYO + *EXPOSURE, CHRONIC + RBE + BIOLOGICAL CONTROL + *IN VITRO + HPIS

082903
HAKONSON TE + NYHAN JW + JOHNSON LJ
ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31, 1972
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5282-MS +. 47 PAGES, 17 TABLES, 17 FIGURES, 56 REFERENCES, MAY 1973

LIQUID-WASTE-DISPOSAL-AREA HISTORY IS SUMMARIZED, INCLUDING ACCUMULATIVE PU. MOST BIOTA HAD TRITIUM LESS THAN THE EFFLUENT WATER; HOWEVER HONEYBEES HAD AS MUCH AS TWO ORDERS OF MAGNITUDE HIGHER LEVELS, APPARENTLY FROM THE FORAGING OF THE BEES ON CLOVER GROWING NEAR DISPOSAL PITS. THERE WAS ALSO EVIDENCE OF UPTAKE OF CS-137 AND PU BY BIOTA IN AN AREA WITHIN ABOUT 2500 METERS OF THE WASTE OUTFALLS; HOWEVER MOST CS-137 REMAINED IN STREAM CHANNEL ALLUVIUM. THE ROLE OF EFFLUENT PH IN MEDIATING CS-137 AND PU TRANSPORT WILL BE STUDIED. RADIONUCLIDES ARE BEING DETERMINED IN SOILS AND BIOTA IN THE VICINITY OF THE 1945 TRINITY SHOT NEAR ALAMAGORDO, NEW MEXICO.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + EFFLUENT + PLUTONIUM + SURVEY, ENVIRONMENT + *WASTE DISPOSAL, TERRESTRIAL + NUCLEAR DETONATION + *LASL + CRITICAL NUCLIDE PATHWAY + *RADIONUCLIDE UPTAKE + VEGETATION + FIELD EXPERIMENT + INSECT + EFFECT, PH + MAMMAL, RODENT

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

ABSORBED FRACTION
064739 P 34 064740 P 34
ABSORPTION
040665 P 4 041886 P 11 043093 P 16 043104 P 16
043152 P 17 043246 P 18 047885 P 22 047898 P 22
049587 P 23 049607 P 24 051228 P 26 051628 P 27
061721 P 31 064727 P 32 064737 P 33 064748 P 36
064764 P 42 065935 P 47 067133 P 50 070396 P 52
074536 P 53
ACCUMULATION
041886 P 11 041888 P 11 043086 P 15
ACID
042770 P 14 043101 P 16 051975 P 27 054673 P 28
062623 P 31
ADRENAL
049588 P 23 056181 P 29 064738 P 34 067165 P 51
ADSORPTION
041888 P 11 043274 P 18
AGED
056179 P 29
AGENCY, AEC
064749 P 37
AGRICULTURE
043092 P 15 043359 P 19 045087 P 22 077006 P 55
AIR
067088 P 49 077200 P 55
AIRBORNE RELEASE
055111 P 29 065101 P 46
AMINO ACID
040664 P 3 040679 P 6 040682 P 7 040683 P 7
040779 P 8 040784 P 9 040785 P 9 041899 P 13
041901 P 13 067143 P 50
ANALYTICAL MODEL
069935 P 52
ANALYTICAL TECHNIQUE
040669 P 4 040791 P 10 040792 P 10 041890 P 12
042767 P 14 043592 P 20 055111 P 29 062253 P 31
064760 P 40 064761 P 41 064762 P 41 064763 P 41
064769 P 42 064779 P 45 067023 P 48 067143 P 50
077006 P 55
ANIMAL
016938 P 1 040669 P 4 040674 P 5 050527 P 25
051573 P 26 053130 P 28 061100 P 30 065935 P 47
069508 P 52 069935 P 52 075281 P 54
ANIMAL FEED
081542 P 57
ANIMAL, AMPHIBIAN
040674 P 5 040781 P 8 067798 P 51
ANIMAL, FISH
012939 P 1 026846 P 2 043180 P 18 045046 P 21
064743 P 35 065088 P 46 065955 P 48 066272 P 48
069507 P 52 075309 P 54 075321 P 55 077200 P 55
079184 P 56 080624 P 56 081340 P 56 081542 P 57
ANIMAL, INVERTEBRATE
018273 P 1 043105 P 17 077200 P 55 081340 P 56
ANIMAL, VERTEBRATE
040664 P 3 049533 P 23 049587 P 23 049600 P 23
049604 P 24 049607 P 24 049639 P 24 049684 P 24
049712 P 25 049713 P 25 049714 P 25 056179 P 29
056181 P 29 058835 P 30 062623 P 31 064726 P 32
064727 P 32 064728 P 32 064735 P 33 064737 P 33
064738 P 34 064739 P 34 064740 P 34 064741 P 35
064743 P 35 064744 P 35 064745 P 35 064746 P 36
064747 P 36 064748 P 36 064749 P 37 064750 P 37
064751 P 37 064752 P 38 064753 P 38 064754 P 38
064755 P 39 064756 P 39 064757 P 39 064758 P 40
064759 P 40 064760 P 40 064761 P 41 064762 P 41
064763 P 41 064764 P 42 064765 P 42 064766 P 42
064769 P 42 064770 P 43 064771 P 43 064772 P 43
064773 P 44 064777 P 44 064778 P 44 064779 P 45
064781 P 45 064783 P 45 067023 P 48 067088 P 49
067122 P 49 067123 P 49 067124 P 50 067133 P 50
067143 P 50 067165 P 51 077006 P 55
ANL
061100 P 30
AQUATIC ORGANISM
018273 P 1 043088 P 15 043180 P 18 045046 P 21
048349 P 22 061100 P 30 077200 P 55 081340 P 56
081542 P 57
ASSIMILATION
075281 P 54 075321 P 55
ATMOSPHERIC POLLUTION
043102 P 16 043106 P 17 069396 P 51
AUTORADIOGRAPHY
049714 P 25 051225 P 26 051965 P 27 054673 P 28
064726 P 32 064741 P 35 064744 P 35 064745 P 35
064747 P 36 064748 P 36 064750 P 37 064751 P 37
064752 P 38 064755 P 39 064758 P 40 064759 P 40
064761 P 41 064765 P 42
BACTERIA
040666 P 4 040679 P 6 040682 P 7 040779 P 8
040785 P 9 040787 P 9 040788 P 9 041889 P 11
041895 P 13 041901 P 13 053555 P 28
BATTELLE NORTHWEST
065087 P 46 075246 P 54 080624 P 56 081340 P 56
BEHAVIOR
026846 P 2 037402 P 3 052180 P 27
BELGIUM
064781 P 45 081542 P 57
BENEFICIAL USE, AGRICULTURE
077006 P 55
BENEFICIAL USE, AQUACULTURE
066269 P 48
BENEFIT VS RISK
067088 P 49
BETA EMITTER
040683 P 7 041574 P 10 043093 P 16 069396 P 51
BETA RAY
051314 P 26 051965 P 27 054897 P 28
BIBLIOGRAPHY
042769 P 14 057579 P 30 067088 P 49 068619 P 51
075246 P 54
BIOACCUMULATION/TURNOVER
018273 P 1 043092 P 15 043180 P 18 043182 P 18
045046 P 21 048349 P 22 057579 P 30 060607 P 30
061100 P 30 061130 P 31 062253 P 31 065088 P 46
065101 P 46 065955 P 48 066272 P 48 067798 P 51
068619 P 51 069508 P 52 069935 P 52 073994 P 53
075321 P 55 077200 P 55
BIOCHEMICAL
049600 P 23 051314 P 26 051402 P 26 052980 P 28
054673 P 28 054897 P 28 054914 P 28 064726 P 32
064736 P 33 064760 P 40 064761 P 41 064762 P 41
064763 P 41 064764 P 42 064765 P 42 064766 P 42
064769 P 42 064770 P 43 064778 P 44 067023 P 48
067133 P 50 067143 P 50
BIOLOGICAL CONTROL
042767 P 14 069396 P 51 075281 P 54 077191 P 55
077200 P 55 082345 P 57 082373 P 57
BIOLOGICAL HALF-LIFE
040665 P 4 043102 P 16 043182 P 18 043304 P 19
043358 P 19 043591 P 20 047885 P 22 047898 P 22
049222 P 22 049604 P 24 060933 P 31 062623 P 31
064727 P 32 064744 P 35 064747 P 36 064749 P 37
064756 P 39 064766 P 42 064777 P 44 064778 P 44
064779 P 45 064783 P 45 067123 P 49 071505 P 53
075319 P 54 077200 P 55 079184 P 56
BIOMEDICAL
016938 P 1 023154 P 2 049600 P 23 055111 P 29
064747 P 36 064749 P 37 064763 P 41 064771 P 43
064783 P 45 066272 P 48 067133 P 50 072215 P 53
075281 P 54 082373 P 57
BLOOD
040675 P 6 040681 P 6 041886 P 11 042766 P 14
042852 P 15 043103 P 16 043152 P 17 043358 P 19
043365 P 19 044225 P 20 049222 P 22 049587 P 23
049588 P 23 049639 P 24 049684 P 24 064727 P 32
064738 P 34 064752 P 38 064754 P 38 064759 P 40
064778 P 44 067165 P 51
BLOOD, PLASMA
056181 P 29 064726 P 32 064747 P 36 064763 P 41
064783 P 45 067023 P 48 067133 P 50
BLOOD, RBC
064754 P 38 067133 P 50
BLOOD, SERUM
041886 P 11 049684 P 24
BLOOD, VASCULAR SYSTEM
041886 P 11
BODY BURDEN
049713 P 25 065122 P 47

BODY FLUID
044225 P 20 049222 P 22 049684 P 24 049713 P 25
064727 P 32 064728 P 32 064747 P 36 064748 P 36
064766 P 42 064770 P 43 064783 P 45 065935 P 47
067088 P 49 067124 P 50 071505 P 53
BONE
048349 P 22 049639 P 24 051965 P 27 054728 P 28
064728 P 32 064778 P 44 067124 P 50
BONE, MARROW
041891 P 12 049587 P 23 049600 P 23 049684 P 24
049714 P 25 054728 P 28 056181 P 29 061130 P 31
062623 P 31 064747 P 36 064748 P 36 064754 P 38
064756 P 39 064759 P 40 067165 P 51
BRAIN
049533 P 23 049588 P 23 049600 P 23 049684 P 24
049713 P 25 056181 P 29 062623 P 31 064728 P 32
064735 P 33 064738 P 34 064743 P 35 064744 P 35
064762 P 41 064777 P 44 064778 P 44 067124 P 50
067165 P 51
BROMINE
077006 P 55
BULGARIA
080624 P 56
CALCIUM
077006 P 55
CALVERT CLIFFS 1 (PWR)
038641 P 3 044109 P 20
CALVERT CLIFFS 2 (PWR)
038641 P 3
CANAL
080624 P 56
CANCER
049600 P 23
CARBON
040671 P 5 040680 P 6 040781 P 8 043102 P 16
043106 P 17 051223 P 26 054625 P 28 064735 P 33
064746 P 36 064758 P 40 064761 P 41 064764 P 42
064769 P 42 067023 P 48 067133 P 50 075321 P 55
CARBON DIOXIDE
069507 P 52
CARCINOGEN
042852 P 15
CECUM
042765 P 14
CELL
040666 P 4 040667 P 4 040668 P 4 040679 P 6
040681 P 6 040782 P 8 041899 P 13 041901 P 13
043182 P 18 043359 P 19 052180 P 27 054728 P 28
064736 P 33 064737 P 33 064738 P 34 064739 P 34
064740 P 34 064741 P 35 064744 P 35 064745 P 35
064746 P 36 064750 P 37 064751 P 37 064752 P 38
064753 P 38 064754 P 38 064755 P 39 064759 P 40
064760 P 40 064765 P 42 065659 P 47
CELL, ENDOTHELIAL
064754 P 38
CELL, EPITHELIAL
064754 P 38
CELL, MEMBRANE
044225 P 20
CELL, NUCLEOLUS
040780 P 8 064741 P 35
CELL, NUCLEUS
040670 P 5 040780 P 8 040785 P 9 040786 P 9
040788 P 9 040790 P 10 040791 P 10 041888 P 11
041890 P 12 041893 P 12 049684 P 24 058835 P 30
064736 P 33 064737 P 33 064739 P 34 064740 P 34
064745 P 35 064746 P 36 064750 P 37 064751 P 37
064752 P 38 064753 P 38 064754 P 38 064755 P 39
064771 P 43 064772 P 43
CELL, STEM
041574 P 10 041900 P 13
CERIUM
061130 P 31
CESIUM
013818 P 1 061130 P 31 065087 P 46 075309 P 54
075321 P 55 079184 P 56 082345 P 57 082903 P 58
CHALK RIVER
066272 P 48
CHAMBER, ION
043105 P 17
CHELATE
065659 P 47
CHEMICAL EQUILIBRIUM
077200 P 55
CHEMICAL KINETICS
043092 P 15 077200 P 55
CHEMICAL REACTION
043592 P 20
CHLORIDE
043086 P 15 051309 P 26
CHLORINE
043246 P 18 079194 P 56
CHROMATOGRAPHY
043101 P 16 044763 P 21 064762 P 41 067143 P 50
CHROMIUM
077006 P 55
CHROMOSOMAL EFFECT
040666 P 4 040667 P 4 040673 P 5 040681 P 6
040790 P 10 041893 P 12 041900 P 13 043274 P 18
049714 P 25 053555 P 28 064759 P 40 064772 P 43
065659 P 47 079184 P 56
CIVIL DEFENSE
064737 P 33
CNS
056181 P 29 064752 P 38
COBALT
040783 P 8 075309 P 54 081542 P 57 082373 P 57
CODES AND STANDARDS
064739 P 34 064749 P 37
COMPARISON
041892 P 12 043093 P 16 043274 P 18 043359 P 19
047898 P 22 051573 P 26 051582 P 27 065163 P 47
065935 P 47
COMPARISON, THEORY AND EXPERIENCE
069935 P 52
COMPARTMENT
064750 P 37 064758 P 40
COMPUTER CONTROL
064760 P 40
COMPUTER PROGRAM
064783 P 45
COMPUTER, ANALOG
064745 P 35 064765 P 42
CONCENTRATION
016938 P 1 026846 P 2 028688 P 3 040781 P 8
040791 P 10 042769 P 14 042770 P 14 043086 P 15
043088 P 15 043093 P 16 043101 P 16 043102 P 16
043103 P 16 043106 P 17 043152 P 17 043190 P 18
043246 P 18 043304 P 19 043365 P 19 043593 P 20
047898 P 22 049222 P 22 049533 P 23 049639 P 24
049713 P 25 051402 P 26 051573 P 26 060933 P 31
062623 P 31 064726 P 32 064728 P 32 064735 P 33
064736 P 33 064737 P 33 064738 P 34 064743 P 35
064744 P 35 064748 P 36 064752 P 38 064756 P 39
064758 P 40 064761 P 41 064762 P 41 064771 P 43
064778 P 44 065122 P 47 065163 P 47 067122 P 49
067123 P 49 067124 P 50 067133 P 50 070396 P 52
074536 P 53 077006 P 55 082345 P 57
CONCENTRATION FACTOR
012939 P 1 045046 P 21 061100 P 30 065088 P 46
065101 P 46 067798 P 51 069935 P 52 079184 P 56
CONCENTRATION, MAXIMUM
075309 P 54
CONSUMER PRODUCT
064781 P 45
CONTAINMENT
077191 P 55
CONTAINMENT, FUEL REPROCESSING
065101 P 46
CONTAMINATION
065163 P 47 074536 P 53 078468 P 56 082345 P 57
CONTROL
043088 P 15
CORRELATION
045087 P 22 049588 P 23 064728 P 32 064735 P 33
064741 P 35 064743 P 35 064746 P 36 064749 P 37
064764 P 42 064772 P 43 064773 P 44 064777 P 44
067023 P 48
COUNTER
016938 P 1 040791 P 10 042767 P 14 042769 P 14
042770 P 14 043101 P 16 043105 P 17 043358 P 19
049222 P 22
CRITICAL MASS
062623 P 31 064748 P 36 067165 P 51
CRITICAL NUCLIDE
070396 P 52
CRITICAL NUCLIDE PATHWAY
068619 P 51 069508 P 52 069935 P 52 070396 P 52
075281 P 54 075309 P 54 075319 P 54 075321 P 55
079184 P 56 081340 P 56 081542 P 57 082903 P 58
CRUSTACEAN
013818 P 1 023154 P 2 043102 P 16 045046 P 21
069935 P 52
CULTURE
040666 P 4 040667 P 4 040670 P 5 040671 P 5
040674 P 5 040785 P 9 040788 P 9 040790 P 10
041890 P 12 064746 P 36
DAMAGE
052834 P 27
DATA COLLECTION
043088 P 15 077191 P 55
DAY

049587 P 23 049588 P 23 064750 P 37
DECOMPOSITION
040784 P 9 053555 P 28
DECONTAMINATION
016938 P 1
DEPOSITION
027023 P 2 043104 P 16
DESTRUCTIVE WIND
045087 P 46
DEUTERIUM
041892 P 12 043591 P 20 043592 P 20 044225 P 20
051582 P 27 064769 P 42 075281 P 54
DIETARY HABIT
023154 P 2 064754 P 38 064770 P 43 068619 P 51
075309 P 54
DIFFUSION
043092 P 15 044225 P 20 051226 P 26 051313 P 26
DIFFUSION COEFFICIENT
043350 P 19
DILUTION
069508 P 52
DISCHARGE
080624 P 56
DISEASE
081340 P 56
DISTRIBUTION
041894 P 12 043093 P 16 045087 P 22 049587 P 23
049588 P 23 049600 P 23 049639 P 24 049684 P 24
049713 P 25 051223 P 26 051226 P 26 051228 P 26
051313 P 26 056181 P 29 058835 P 30 062623 P 31
064726 P 32 064728 P 32 064752 P 38 064756 P 39
064758 P 40 064761 P 41 064762 P 41 064771 P 43
064778 P 44 067124 P 50 067133 P 50 067165 P 51
075281 P 54 077006 P 55 077200 P 55
DISTRIBUTION, MICRO
058835 P 30 064739 P 34 064740 P 34 064745 P 35
064749 P 37 064751 P 37 064752 P 38 064753 P 38
064754 P 38 064765 P 42 067133 P 50
DIVERSITY, SPECIES
064743 P 35
DNA
040664 P 3 040667 P 4 040670 P 5 040671 P 5
040674 P 5 040679 P 6 040680 P 6 040682 P 7
040683 P 7 040779 P 8 040786 P 9 040787 P 9
040788 P 9 040789 P 10 041574 P 10 041888 P 11
041889 P 11 041890 P 12 041893 P 12 041895 P 13
041899 P 13 041901 P 13 044763 P 21 049714 P 25
058835 P 30 064726 P 32 064735 P 33 064736 P 33
064737 P 33 064738 P 34 064741 P 35 064743 P 35
064744 P 35 064745 P 35 064749 P 37 064753 P 38
064754 P 38 064755 P 39 064758 P 40 064760 P 40
064761 P 41 064762 P 41 064764 P 42 064765 P 42
064766 P 42 064770 P 43 064771 P 43 064772 P 43
065659 P 47 067088 P 49 067123 P 49
DOSE
042766 P 14 047898 P 22 052834 P 27 065122 P 47
070396 P 52 071505 P 53 077200 P 55 082373 P 57
DOSE CALCULATION, EXTERNAL
043093 P 16 064741 P 35 068619 P 51 069396 P 51
DOSE CALCULATION, INTERNAL
040675 P 6 040776 P 7 045046 P 21 049587 P 23
049588 P 23 049600 P 23 049639 P 24 049684 P 24
049714 P 25 058835 P 30 060933 P 31 061130 P 31
062623 P 31 064728 P 32 064739 P 34 064740 P 34
064741 P 35 064749 P 37 064753 P 38 064758 P 40
064759 P 40 064770 P 43 064771 P 43 064772 P 43
064778 P 44 064783 P 45 067088 P 49 067123 P 49
067124 P 50 067165 P 51 068619 P 51 069508 P 52
071505 P 53 075309 P 54 075321 P 55
DOSIMETRY
013818 P 1 040674 P 5 040776 P 7 062253 P 31
064739 P 34 064740 P 34 066272 P 48
DOSIMETRY, CLINICAL
043152 P 17 043246 P 18
DOSIMETRY, PHOTOGRAPHIC
040789 P 10
DOSIMETRY, THERMOLUMINESCENCE
066272 P 48
DRY
067165 P 51
DURATION, GENERATION
040666 P 4 064757 P 39 064770 P 43 067124 P 50
ECOLOGY
013818 P 1 016938 P 1 021312 P 2 023154 P 2
027023 P 2 028688 P 3 037402 P 3 038641 P 3
044471 P 21 053417 P 28 070396 P 52 077200 P 55
082345 P 57
ECOSYSTEM
056628 P 29 065087 P 46 065101 P 46 069508 P 52
081542 P 57
ECOSYSTEM, AQUATIC
045046 P 21 065087 P 46 065088 P 46 066272 P 48
067798 P 51 069508 P 52 079184 P 56 081340 P 56
081542 P 57
ECOSYSTEM, ARCTIC
065087 P 46
ECOSYSTEM, DESERT
065087 P 46 065101 P 46
ECOSYSTEM, ESTUARINE
075321 P 55 080624 P 56
ECOSYSTEM, FOREST
056628 P 29 065101 P 46 073994 P 53
ECOSYSTEM, GRASSLAND
064781 P 45 065087 P 46 065163 P 47 075319 P 54
081542 P 57
ECOSYSTEM, MARINE
069935 P 52 075321 P 55
ECOSYSTEM, MODEL
045046 P 21 068619 P 51 069935 P 52 075309 P 54
075321 P 55
ECOSYSTEM, TROPICAL
056628 P 29 069396 P 51
EFFECT
051314 P 26 051402 P 26 051589 P 27 052180 P 27
053130 P 28 053555 P 28 054625 P 28 079184 P 56
EFFECT, AGE
056179 P 29 064738 P 34 064751 P 37 064752 P 38
064755 P 39 071505 P 53
EFFECT, DOSE
026846 P 2 049533 P 23 049714 P 25 058835 P 30
064735 P 33 064738 P 34 064740 P 34 064741 P 35
064745 P 35 064746 P 36 064755 P 39 064757 P 39
064758 P 40 064765 P 42 064771 P 43 064772 P 43
065659 P 47 067143 P 50
EFFECT, DOSE RATE
082373 P 57
EFFECT, GENETIC
040673 P 5 040786 P 9 040787 P 9 040789 P 10
040790 P 10 042766 P 14 042852 P 15 043180 P 18
049717 P 25 049714 P 25 051968 P 27 064757 P 39
066272 P 48 067088 P 49
EFFECT, MASS
064745 P 35 064746 P 36 064752 P 38 064758 P 40
064765 P 42 064769 P 42 064783 P 45 067023 P 48
EFFECT, PH
082903 P 58
EFFECT, SEX
026846 P 2 064751 P 37 064757 P 39
EFFECT, SOMATIC
040667 P 4 040790 P 10 066272 P 48
EFFLUENT
044471 P 21 065122 P 47 066272 P 48 077191 P 55
082903 P 58
EGG
065955 P 48 067124 P 50 079184 P 56 080624 P 56
ELEMENTS AND ISOTOPES
051589 P 27
ELIMINATION
043154 P 17 043304 P 19 075281 P 54
EMBRYO
043364 P 19 064735 P 33 065088 P 46 065955 P 48
067124 P 50 069507 P 52 082373 P 57
ENERGY SPECTRUM
064739 P 34
ENVIRONMENT
037402 P 3 040781 P 8 043088 P 15 043105 P 17
043180 P 18 044378 P 21 049607 P 24 067088 P 49
069396 P 51 075246 P 54 077006 P 55 077191 P 55
ENVIRONMENTAL CONTROL MEASURE
044109 P 20 049713 P 25 069508 P 52
ENVIRONMENTAL PROTECTION AGENCY (EPA)
078468 P 56
ENZYME
040787 P 9 044763 P 21 065659 P 47
EQUILIBRIUM
043304 P 19 043358 P 19 043359 P 19 043365 P 19
067124 P 50
EQUIPMENT DESIGN
040792 P 10
ERROR ANALYSIS
049222 P 22
ESTUARY
066269 P 48
EURATOM
075309 P 54
EVAPORATION
027023 P 2 037402 P 3 043304 P 19 045087 P 22
051226 P 26
EXCAVATION, NUCLEAR
021312 P 2
EXCRETION
043104 P 16 043105 P 17 043154 P 17 047885 P 22

064764 P 42 077006 P 55 077200 P 55
EXCRETION, FECAL
047898 P 22
EXCRETION, URINE
043358 P 19 043365 P 19 047898 P 22 049222 P 22
056181 P 29 060933 P 31 064727 P 32 064747 P 36
064779 P 45 064783 P 45 065935 P 47
EXPERIMENT
043088 P 15 043103 P 16 043154 P 17 043592 P 20
065122 P 47
EXPONENTIAL FUNCTION
049588 P 23 049684 P 24 064727 P 32 064777 P 44
064778 P 44 064779 P 45 064783 P 45 067165 P 51
EXPOSURE, ACUTE
043274 P 18 067088 P 49 071505 P 53
EXPOSURE, BACKGROUND
049713 P 25 064770 P 43
EXPOSURE, CHRONIC
049533 P 23 049684 P 24 049713 P 25 064728 P 32
064757 P 39 064762 P 41 064766 P 42 064770 P 43
064777 P 44 064778 P 44 064781 P 45 067088 P 49
067165 P 51 082373 P 57
EXPOSURE, IM
067165 P 51
EXPOSURE, IP
040678 P 6 040775 P 7 043591 P 20 049587 P 23
049604 P 24 062623 P 31 064728 P 32 064735 P 33
064738 P 34 064741 P 35 064744 P 35 064745 P 35
064750 P 37 064751 P 37 064752 P 38 064755 P 39
064756 P 39 064758 P 40 064761 P 41 064762 P 41
064765 P 42 064778 P 44 067123 P 49
EXPOSURE, IV
043103 P 16 043152 P 17 043358 P 19 049600 P 23
049714 P 25 056181 P 29 062623 P 31 064726 P 32
064747 P 36 064753 P 38 064763 P 41 064783 P 45
067133 P 50
EXPOSURE, SC
058835 P 30 064735 P 33 064771 P 43
EXPOSURE, SKIN
049607 P 24
FALLOUT
056628 P 29 060607 P 30 061130 P 31 069508 P 52
FAT
043101 P 16 049588 P 23 049713 P 25 056181 P 29
062623 P 31 064727 P 32 064728 P 32 064761 P 41
064762 P 41 064766 P 42 064769 P 42 064777 P 44
064778 P 44 067124 P 50 067133 P 50
FEMALE
049533 P 23 049604 P 24 049639 P 24 056179 P 29
064737 P 33 064738 P 34 064745 P 35 064751 P 37
064752 P 38 064757 P 39 064761 P 41 064767 P 41
064765 P 42 064779 P 45 067122 P 49 067124 P 50
FETUS
040668 P 4 042766 P 14 043364 P 19 049533 P 23
049588 P 23 049639 P 24 064757 P 39 067124 P 50
077006 P 55
FIELD EXPERIMENT
075309 P 54 082903 P 58
FIRE
065087 P 46
FISSION PRODUCT RELEASE
013458 P 1 044109 P 20 044378 P 21
FLOW, MIXING
043365 P 19
FLUX DISTRIBUTION
043093 P 16 043304 P 19
FOOD
043359 P 19 060607 P 30 061100 P 30 064736 P 33
064743 P 35 064763 P 41 070396 P 52 077006 P 55
078468 P 56 087345 P 57
FOOD CHAIN
044109 P 20 044471 P 21 045046 P 21 051223 P 26
051228 P 26 051314 P 26 061100 P 30 061721 P 31
064736 P 33 064737 P 33 064743 P 35 064763 P 41
064764 P 42 064781 P 45 065087 P 46 065101 P 46
068619 P 51 069935 P 52 070396 P 52 074536 P 53
075309 P 54 075319 P 54 075321 P 55 077200 P 55
081340 P 56 081542 P 57
FOOD INTAKE
064737 P 33 064781 P 45 075319 P 54
FORECAST
069935 P 52
FUEL REPROCESSING
065122 P 47
FUEL, FOSSIL
078468 P 56
GAMMA
013818 P 1 066769 P 48
GAMMA EMITTER
040667 P 4 040679 P 4 040783 P 8
GAS
043101 P 16 051228 P 26 051402 P 26 064727 P 32
064728 P 32 078468 P 56
GI TRACT
040665 P 4 040670 P 5 044225 P 20 049587 P 23
049588 P 23 062623 P 31 064727 P 32 064728 P 32
064735 P 33 064744 P 35 064748 P 36 064762 P 41
065935 P 47 067122 P 49 067124 P 50 067133 P 50
075281 P 54 077006 P 55
GLAND
049588 P 23 064735 P 33
GROUND WATER, NUCLIDE OCCURRENCE
069508 P 52
GROWTH/DEVELOPMENT
018273 P 1 040679 P 6 041891 P 12 048349 P 22
052180 P 27 054625 P 28 065955 P 48 066269 P 48
HAIR
042253 P 31 064750 P 37 067143 P 50
HALF-LIFE, EFFECTIVE
071505 P 53
HANFORD SITE
065955 P 48 081340 P 56
HAZARD, RELATIVE
049712 P 25 057579 P 30 058835 P 30 064735 P 33
064740 P 34 064741 P 35 064746 P 36 064749 P 37
064753 P 38 064772 P 43 064778 P 44 067088 P 49
067165 P 51 068619 P 51 069396 P 51 077191 P 55
HAZARDS ANALYSIS
064757 P 39 064766 P 42 064770 P 43 064781 P 45
077200 P 55
HEALTH PHYSICS TRAINING
016938 P 1
HEART
049533 P 23 049588 P 23 049600 P 23 049713 P 25
062623 P 31 064728 P 32 064735 P 33 064738 P 34
064744 P 35 064762 P 41 064778 P 44 067124 P 50
HEAVY WATER
043086 P 15 043092 P 15 043101 P 16 043103 P 16
043105 P 17 043152 P 17 043154 P 17 043180 P 18
043182 P 18 043274 P 18 043304 P 19 043358 P 19
043359 P 19 043593 P 20
HIGH
051402 P 26 052834 P 27
HISTOPATHOLOGY
049714 P 25 064755 P 39
HOUR
064727 P 32 064745 P 35 064747 P 36 064748 P 36
064751 P 37 064752 P 38 064761 P 41 064765 P 42
064783 P 45 067023 P 48 067133 P 50
HPIS
077191 P 55 077200 P 55 082345 P 57 082373 P 57
HYDROGEN
023154 P 2 043592 P 20 044225 P 20 064769 P 42
067088 P 49 067123 P 49 067133 P 50 075281 P 54
HYDROLOGY
037402 P 3
IAEA
064759 P 40
IC GROSSLY NORMAL
064763 P 41 064779 P 45 064783 P 45
IC PATHOLOGICAL
049600 P 23 064747 P 36 064763 P 41
ICRP
049684 P 24 049712 P 25 062623 P 31 064727 P 32
064749 P 37 064773 P 44 067088 P 49
IMMATURE
040782 P 8 040783 P 8 056179 P 29 064751 P 37
067124 P 50
IMMUNOLOGY
041891 P 12 081340 P 56
IN VITRO
044763 P 21 049712 P 25 049714 P 25 064726 P 32
064746 P 36 064760 P 40 064769 P 42 064772 P 43
082373 P 57
INCIDENT, EXPOSURE
060933 P 31
INCIDENT, FATALITY
060933 P 31
INCINERATION
043101 P 16
INDUSTRY, UTILITY
067143 P 50
INFANT
056179 P 29
INGESTION
043104 P 16 043358 P 19 049533 P 23 049587 P 23
058835 P 30 064727 P 32 064728 P 32 064748 P 36
064757 P 39 064766 P 42 064781 P 45 065163 P 47
067088 P 49 067123 P 49 067124 P 50 067133 P 50
068619 P 51 070396 P 52 077006 P 55
INHALATION
051402 P 26 060933 P 31 061721 P 31 064727 P 32

064728 P 32 067088 P 49 070396 P 52
INSECT
040680 P 6 040780 P 8 040783 P 8 040789 P 10
049714 P 25 061100 P 30 082345 P 57 082903 P 58
INTAKE
064727 P 32 064757 P 39
INTESTINE, LARGE
049600 P 23 064738 P 34 064754 P 38 064756 P 39
INTESTINE, SMALL
041886 P 11 049600 P 23 049684 P 24 058835 P 30
064726 P 32 064738 P 34 064745 P 35 064748 P 36
064754 P 38 064756 P 39 064771 P 43
IODINE
072215 P 53 077006 P 55
ION EXCHANGE
075281 P 54 081542 P 57
IRON
054914 P 28 075309 P 54
ISOTOPIC FRACTIONATION
043592 P 20 064769 P 42 065101 P 46
ITALY
075309 P 54
KIDNEY
049533 P 23 049588 P 23 049600 P 23 049713 P 25
056181 P 29 058835 P 30 062623 P 31 064728 P 32
064735 P 33 064738 P 34 064744 P 35 064748 P 36
064752 P 38 064758 P 40 064761 P 41 064762 P 41
064778 P 44 067124 P 50 067165 P 51
KRYPTON
043102 P 16 044471 P 21
LABORATORY EXPERIMENT
061100 P 30 069507 P 52 069935 P 52
LAKE
012939 P 1 057579 P 30 066272 P 48
LAKE NORMAN
040674 P 5
LARVA
066269 P 48 079184 P 56
LASL
082345 P 57 082903 P 58
LETHAL DOSE
040665 P 4 040683 P 7 041889 P 11 043274 P 18
079184 P 56 082373 P 57
LEUKEMIA
040675 P 6 040778 P 7
LINEAR ENERGY TRANSFER
064740 P 34
LIQUID
040791 P 10 040792 P 10 064727 P 32 064728 P 32
LIVER
040664 P 3 042852 P 15 049533 P 23 049587 P 23
049588 P 23 049600 P 23 049639 P 24 049684 P 24
049713 P 25 056181 P 29 058835 P 30 062623 P 31
064726 P 32 064728 P 32 064735 P 33 064738 P 34
064743 P 35 064744 P 35 064748 P 36 064752 P 38
064755 P 39 064758 P 40 064761 P 41 064762 P 41
064770 P 43 064771 P 43 064778 P 44 067122 P 49
067123 P 49 067124 P 50 067133 P 50 067165 P 51
LIVESTOCK
043103 P 16 043104 P 16 043182 P 18 043364 P 19
043365 P 19 061721 P 31
LUMINARY
047885 P 22 047898 P 22 064779 P 45 065935 P 47
077200 P 55
LUNG
044225 P 20 049587 P 23 049588 P 23 049600 P 23
056181 P 29 062623 P 31 064735 P 33 064738 P 34
064754 P 38 064756 P 39 064778 P 44 067124 P 50
075281 P 54
LYMPH NODE
049588 P 23 056181 P 29 062623 P 31 064754 P 38
LYMPHATIC SYSTEM
040681 P 6 041891 P 12
MALE
049587 P 23 049604 P 24 056179 P 29 056181 P 29
058835 P 30 064726 P 32 064727 P 32 064737 P 33
064738 P 34 064741 P 35 064747 P 36 064748 P 36
064750 P 37 064751 P 37 064752 P 38 064756 P 39
064758 P 40 064763 P 41 064771 P 43 064783 P 45
067122 P 49 067165 P 51
MAMMAL
040788 P 9 041574 P 10 041899 P 13 049222 P 22
052180 P 27
MAMMAL, COW
064781 P 45 065163 P 47 077006 P 55
MAMMAL, DOG
064743 P 35 064754 P 38 064773 P 44
MAMMAL, LARGE
041887 P 11 043358 P 19 043593 P 20 049713 P 25
064773 P 44 064777 P 44 064778 P 44 067143 P 50
077006 P 55
MAMMAL, MOUSE
040775 P 7 040778 P 7 049604 P 24 051402 P 26
051748 P 27 051968 P 27 054897 P 28 058835 P 30
064726 P 32 064728 P 32 064735 P 33 064738 P 34
064741 P 35 064744 P 35 064745 P 35 064748 P 36
064750 P 37 064752 P 38 064754 P 38 064757 P 39
064758 P 40 064759 P 40 064762 P 41 064766 P 42
064765 P 42 064773 P 44 067122 P 49 067123 P 49
082373 P 57
MAMMAL, PIG
077006 P 55
MAMMAL, PRIMATE
040681 P 6 056181 P 29
MAMMAL, RAT
040664 P 3 040665 P 4 040668 P 4 040678 P 6
043152 P 17 047885 P 22 047898 P 22 049533 P 23
049587 P 23 049598 P 23 049607 P 24 049639 P 24
049684 P 24 049714 P 25 051582 P 27 051628 P 27
051975 P 27 052834 P 27 054728 P 28 054914 P 28
060607 P 30 062623 P 31 064728 P 32 064737 P 33
064743 P 35 064748 P 36 064751 P 37 064753 P 38
064754 P 38 064755 P 39 064756 P 39 064760 P 40
064761 P 41 064763 P 41 064764 P 42 064766 P 42
064769 P 42 064770 P 43 064771 P 43 064773 P 44
064777 P 44 064778 P 44 065122 P 47 067023 P 48
067123 P 49 067124 P 50 067133 P 50
MAMMAL, RODENT
043104 P 16 049714 P 25 082903 P 58
MAMMAL, SMALL
041886 P 11 041894 P 12 042765 P 14 042766 P 14
042852 P 15 043103 P 16 043182 P 18 043365 P 19
043591 P 20 043593 P 20 047898 P 22 062253 P 31
064743 P 35 064748 P 36 064754 P 38 064772 P 43
064773 P 44 064777 P 44 067165 P 51
MAN
041900 P 13 049600 P 23 049712 P 25 049714 P 25
051573 P 26 051967 P 27 052980 P 28 056179 P 29
061721 P 31 062253 P 31 064727 P 32 064737 P 33
064740 P 34 064746 P 36 064747 P 36 064749 P 37
064754 P 38 064764 P 42 064766 P 42 064773 P 44
064777 P 44 064778 P 44 064779 P 45 064783 P 45
066272 P 48 067088 P 49 068619 P 51 071505 P 53
075246 P 54 075281 P 54 077200 P 55
MANGANESE
075309 P 54 077006 P 55 081542 P 57
MARINE ORGANISM
065088 P 46 075321 P 55 080624 P 56 081542 P 57
MASS
049533 P 23 056181 P 29 064737 P 33 064743 P 35
064756 P 39 064758 P 40 064773 P 44 064777 P 44
067165 P 51
MATHEMATICAL TREATMENT
043092 P 15 043093 P 16 064745 P 35 064765 P 42
064783 P 45
MATURE
049588 P 23 049604 P 24 056179 P 29 058835 P 30
062623 P 31 064726 P 32 064727 P 32 064735 P 33
064737 P 33 064738 P 34 064741 P 35 064744 P 35
064745 P 35 064747 P 36 064748 P 36 064750 P 37
064751 P 37 064752 P 38 064756 P 39 064757 P 39
064758 P 40 064761 P 41 064763 P 41 064765 P 42
064770 P 43 064771 P 43 064779 P 45 064783 P 45
067088 P 49 067122 P 49 067123 P 49 067124 P 50
067133 P 50 067165 P 51
MEASUREMENT
042769 P 14 043101 P 16 043102 P 16 043105 P 17
043106 P 17 065122 P 47 075281 P 54 077191 P 55
METABOLIC KINETICS
044225 P 20 064727 P 32 064750 P 37 064763 P 41
064765 P 42 064783 P 45 075281 P 54 077200 P 55
MILK
043358 P 19 061721 P 31 064781 P 45 065163 P 47
070396 P 52 075309 P 54 075319 P 54 077200 P 55
081542 P 57
MITOCHONDRIA
051975 P 27
MITOSIS
040667 P 4 040668 P 4 040670 P 5 040679 P 6
040681 P 6 040782 P 8 041889 P 11 064740 P 34
064741 P 35 064744 P 35 064754 P 38 064755 P 39
064758 P 40 064759 P 40 064771 P 43
MODEL
041889 P 11 070396 P 52 071505 P 53
MODEL TESTING
043092 P 15 043093 P 16 064765 P 42
MODEL, BIOLOGICAL
064736 P 33 064737 P 33 064738 P 34 064739 P 34
064740 P 34 064743 P 35 064745 P 35 064748 P 36
064750 P 37 064753 P 38 064759 P 40 064760 P 40
064765 P 42 064766 P 42 064773 P 44 064783 P 45
067088 P 49 067798 P 51

MODEL, PHYSICAL
067143 P 50
MOLECULAR EFFECT
042765 P 14 067023 P 48
MOLLUSC
045046 P 21 066269 P 48 067798 P 51 075321 P 55
080624 P 56
MONITOR, AIR
055111 P 29
MONITOR, BACKGROUND
043088 P 15
MONITOR, ENVIRONMENTAL
064781 P 45 073994 P 53 077191 P 55
MONITOR, LIQUID
055111 P 29
MONITOR, NUCLEAR DETONATION
064770 P 43
MONITOR, PERSONNEL
064779 P 45 081542 P 57
MONITORING PROGRAM, ENVIRONMENTAL
066272 P 48
MONITORING SYSTEM, RADIATION
055111 P 29
MONTH
049600 P 23 049604 P 24 049684 P 24 056181 P 29
058835 P 30 062623 P 31 064728 P 32 064744 P 35
064756 P 39 064757 P 39 064758 P 40 064777 P 44
064778 P 44 067165 P 51
MORPHOLOGY
056181 P 29 064741 P 35
MORTALITY
040778 P 7 040783 P 8 040788 P 9 041899 P 13
MOUTH
064754 P 38
MPBB
064773 P 44 067088 P 49
MPC
049684 P 24 051573 P 26 064727 P 32 064773 P 44
067088 P 49
MUSCLE
049588 P 23 049600 P 23 049639 P 24 049684 P 24
049713 P 25 058835 P 30 062623 P 31 064728 P 32
064744 P 35 064748 P 36 064752 P 38 064758 P 40
064762 P 41 064778 P 44 067124 P 50 067143 P 50
067165 P 51
MUTATION
040667 P 4 040679 P 6 040680 P 6 040682 P 7
040683 P 7 040776 P 7 040779 P 8 040780 P 8
040786 P 9 040787 P 9 044763 P 21 065659 P 47
N-POWER, SAFETY OF
044109 P 20 044378 P 21
NCRP
067088 P 49
NETHERLANDS
075319 P 54
NEUTRON
013818 P 1
NEVADA TEST SITE
045087 P 22 064770 P 43
NEWBORN
042766 P 14 056179 P 29 064735 P 33 064757 P 39
067124 P 50
NRC QUESTION
038641 P 3
NUCLEAR DETONATION
023154 P 2 040664 P 3 040781 P 8 045087 P 22
077191 P 55 082903 P 58
NUCLEOTIDE
064750 P 37 064752 P 38 064760 P 40 064761 P 41
064771 P 43
OBSERVED RATIO
064726 P 32 064769 P 42 067023 P 48
OCEAN AND SEA
048349 P 22 057479 P 30 075321 P 55
OCEAN, PACIFIC
080624 P 56
OPPONENT
044378 P 21
ORGAN
049607 P 24 050527 P 25 056181 P 29 060933 P 31
064737 P 33 064743 P 35 064756 P 39 064758 P 40
067165 P 51
ORGAN, OTHER
064738 P 34 064778 P 44
ORGANIC
049533 P 23 049600 P 23 049714 P 25 056181 P 29
058835 P 30 062623 P 31 064726 P 32 064752 P 38
064763 P 41 064766 P 42 064769 P 42 064772 P 43
064777 P 44 064778 P 44 064781 P 45 065163 P 47
067023 P 48 067123 P 49 067133 P 50 069508 P 52
075319 P 54
ORNL
012939 P 1
OVARY
049588 P 23 064738 P 34 064757 P 39
OXIDATION
067143 P 50
OXIDE
042766 P 14 043364 P 19 043365 P 19 049533 P 23
049604 P 24 049607 P 24 049639 P 24 049684 P 24
049712 P 25 051228 P 26 051628 P 27 051748 P 27
056179 P 29 062623 P 31 064727 P 32 064728 P 32
064735 P 33 064749 P 37 064753 P 38 064766 P 42
064769 P 42 064772 P 43 064773 P 44 064777 P 44
064778 P 44 064783 P 45 067088 P 49 067122 P 49
067123 P 49 067124 P 50 067143 P 50 067165 P 51
075281 P 54 082373 P 57
OXYGEN
042770 P 14 067143 P 50 069507 P 52
PANCREAS
049588 P 23 056181 P 29 062623 P 31 064726 P 32
064738 P 34 064743 P 35
PARASITISM
041887 P 11
PARTICLE
043093 P 16
PATHOLOGY
049600 P 23 064735 P 33 064752 P 38 064753 P 38
064757 P 39
PERSONNEL EXPOSURE, RADIATION
064727 P 32 064749 P 37 064779 P 45 067088 P 49
PHOSPHATE
064760 P 40
PHOSPHORUS
041889 P 11 051223 P 26 077006 P 55
PHYSICOCHEMICAL FORM
049600 P 23 064726 P 32 064761 P 41 064763 P 41
067133 P 50
PHYSIOLOGY/METABOLISM
040775 P 7 042767 P 14 042769 P 14 043101 P 16
043359 P 19 043591 P 20 043592 P 20 045046 P 21
049533 P 23 049587 P 23 049588 P 23 049600 P 23
049604 P 24 049607 P 24 049639 P 24 049684 P 24
049712 P 25 049713 P 25 049714 P 25 056179 P 29
056181 P 29 058835 P 30 061100 P 30 062623 P 31
064726 P 32 064727 P 32 064728 P 32 064735 P 33
064736 P 33 064737 P 33 064738 P 34 064739 P 34
064740 P 34 064741 P 35 064743 P 35 064744 P 35
064745 P 35 064746 P 36 064747 P 36 064748 P 36
064749 P 37 064750 P 37 064751 P 37 064752 P 38
064753 P 38 064754 P 38 064755 P 39 064756 P 39
064757 P 39 064758 P 40 064759 P 40 064760 P 40
064761 P 41 064762 P 41 064763 P 41 064764 P 42
064765 P 42 064766 P 42 064769 P 42 064770 P 43
064771 P 43 064772 P 43 064773 P 44 064777 P 44
064778 P 44 064779 P 45 064781 P 45 064783 P 45
065955 P 48 066272 P 48 067023 P 48 067088 P 49
067122 P 49 067123 P 49 067124 P 50 067133 P 50
067143 P 50 067165 P 51 067798 P 51 071505 P 53
077006 P 55
PHYTOPLANKTON
045046 P 21 075321 P 55
PITUITARY
064751 P 37
PLACENTA
043364 P 19 049588 P 23 049639 P 24
PLACENTAL TRANSFER
065163 P 47
PLANT
040791 P 10 043154 P 17 045087 P 22 051223 P 26
051225 P 26 064736 P 33 064737 P 33 064739 P 34
PLANT, ALGAE/FUNGI
042770 P 14 043086 P 15 043092 P 15 045046 P 21
061100 P 30 081542 P 57
PLANT, MOSS/FERN
081542 P 57
PLANT, SEEDLING
065087 P 46
PLANT, SPERMATOPHYTE
040782 P 8 041888 P 11 043092 P 15 043102 P 16
043106 P 17 043304 P 19 045046 P 21 073994 P 53
PLASTICS
043104 P 16 066272 P 48
PLOWSHARE
021312 P 2 064781 P 45 077191 P 55
PLUTONIUM
075309 P 54 075321 P 55 081542 P 57 082345 P 57
082903 P 58
POLYMERIC
044763 P 21
POPULATION
064738 P 34

POPULATION EXPOSURE
038641 P 3 061130 P 31 064759 P 40 064781 P 45
066272 P 48 067088 P 49 074536 P 53 077200 P 55
POWER FUNCTION
064773 P 44
PRECIPITATION
037402 P 3 043102 P 16 045087 P 22
PREGNANT
049533 P 23 049639 P 24 064757 P 39 067124 P 50
PRODUCTION
077191 P 55
PRODUCTION, RATE
064781 P 45 077006 P 55
PROPERTY, PHYSICAL
075281 P 54
PROPONENT
044109 P 20 044378 P 21
PROTEIN
040664 P 3 040671 P 5 040682 P 7 040683 P 7
040775 P 7 040779 P 8 040784 P 9 040785 P 9
040786 P 9 040787 P 9 040792 P 10 041901 P 13
049604 P 24 064726 P 32 064761 P 41 064762 P 41
064766 P 42 064781 P 45 067143 P 50
PUBLIC HEARING
044378 P 21
PUBLIC RELATIONS
044378 P 21
RADIATION DAMAGE
013818 P 1 067143 P 50
RADIATION EFFECT
013818 P 1 016938 P 1 040665 P 4 040675 P 6
040680 P 6 040776 P 7 040778 P 7 040779 P 8
040787 P 9 040790 P 10 041895 P 13 041900 P 13
041901 P 13 042765 P 14 042766 P 14 042852 P 15
043092 P 15 043103 P 16 043180 P 18 054625 P 29
064770 P 43 065087 P 46 065122 P 47 065659 P 47
065955 P 48 069507 P 52 075246 P 54 077191 P 55
079184 P 56 080624 P 56 081340 P 56
RADIATION EFFECT, AGRICULTURAL
067143 P 50
RADIATION EFFECT, ECOSYSTEM
075321 P 55 081340 P 56
RADIATION EFFECT, SPECIES
026846 P 2 040673 P 5 040678 P 6 040789 P 10
082345 P 57
RADIATION EXPOSURE
052834 P 27 053130 P 28 054728 P 28 075246 P 54
082373 P 57
RADIATION EXPOSURE, ACUTE
043246 P 18 070396 P 52
RADIATION EXPOSURE, CHRONIC
012939 P 1 026846 P 2 040664 P 3 065122 P 47
066272 P 48 067124 P 50 070396 P 52
RADIATION IN PERSPECTIVE
044109 P 20 057579 P 30 068619 P 51
RADIATION INJURY TREATMENT
044763 P 21
RADIATION MODEL
028688 P 3 064739 P 34 064740 P 34
RADIATION MONITORS
016938 P 1 066272 P 48
RADIATION PROFILE
043154 P 17 045087 P 22
RADIATION PROTECTION, CHEMICAL
013818 P 1
RADIATION SAFETY AND CONTROL
013818 P 1 069396 P 51
RADIATION SOURCE, INTERNAL
040776 P 7 040778 P 7 040779 P 8 040780 P 8
040787 P 8 040788 P 8 040789 P 10 040790 P 10
060607 P 30
RADIATION UNIT
064739 P 34
RADIOACTIVITY RELEASE
037402 P 3 044109 P 20 065101 P 46 068619 P 51
069396 P 51 074536 P 53 077191 P 55
RADIOBIOLOGY
040776 P 7 043101 P 16 043103 P 16 044225 P 20
049712 P 25 049714 P 25 067143 P 50 072215 P 53
RADIOCHEMICAL ANALYSIS
040784 P 9
RADIOGRAPHY
040667 P 4 040668 P 4 040669 P 4 040670 P 5
040675 P 6 041890 P 12 041893 P 12
RADIOISOTOPE
043086 P 15 050527 P 25 051573 P 26 068619 P 51
RADIOLESION
040674 P 5
RADIONUCLIDE TRANSFER
043246 P 18 051573 P 26 052980 P 28 064763 P 41
065163 P 47 067023 P 48 069508 P 52 074536 P 53
078468 P 56
RADIONUCLIDE UPTAKE
012939 P 1 018273 P 1 040669 P 4 040791 P 10
042770 P 14 043086 P 15 043092 P 15 043106 P 17
043154 P 17 043274 P 18 043304 P 19 043359 P 19
043593 P 20 044471 P 21 045046 P 21 045087 P 22
048349 P 22 049533 P 23 049587 P 23 049588 P 23
049600 P 23 049604 P 24 049607 P 24 049639 P 24
049684 P 24 049712 P 25 049713 P 25 049714 P 25
051309 P 26 051967 P 27 054914 P 28 056179 P 29
056181 P 29 057579 P 30 058835 P 30 060607 P 30
061100 P 30 061130 P 31 061721 P 31 062253 P 31
062623 P 31 064726 P 32 064727 P 32 064728 P 32
064735 P 33 064736 P 33 064737 P 33 064738 P 34
064739 P 34 064740 P 34 064741 P 35 064743 P 35
064744 P 35 064745 P 35 064746 P 36 064747 P 36
064748 P 36 064749 P 37 064750 P 37 064751 P 37
064752 P 38 064753 P 38 064754 P 38 064755 P 39
064756 P 39 064757 P 39 064758 P 40 064759 P 40
064760 P 40 064761 P 41 064762 P 41 064763 P 41
064764 P 42 064765 P 42 064766 P 42 064769 P 42
064770 P 43 064771 P 43 064772 P 43 064773 P 44
064777 P 44 064778 P 44 064779 P 45 064781 P 45
064783 P 45 065087 P 46 065088 P 46 065101 P 46
065955 P 48 066269 P 48 066272 P 48 067023 P 48
067088 P 49 067122 P 49 067123 P 49 067124 P 50
067133 P 50 067143 P 50 067165 P 51 067798 P 51
068619 P 51 069507 P 52 069508 P 52 069935 P 52
073994 P 53 074536 P 53 075309 P 54 075319 P 54
075321 P 55 077006 P 55 079184 P 56 081340 P 56
081542 P 57 082903 P 58
RADIONUCLIDE, INDUCED
028688 P 3 040780 P 8
RADIOPHARMACEUTICAL
049588 P 23 049600 P 23 062623 P 31
RADIOSENSITIVITY
040788 P 9 054673 P 28 072215 P 53
RAINOUT
043106 P 17 061721 P 31 073994 P 53
RATE
051589 P 27
RBF
040776 P 7 049712 P 25 049714 P 25 064727 P 32
064740 P 34 064746 P 36 067165 P 51 082373 P 57
REACTOR
044471 P 21
REACTOR POWER
044109 P 20
REACTOR, LWR
064781 P 45
REACTOR, POWER
044378 P 21 065101 P 46 065122 P 47 077191 P 55
REACTOR, PWR
038641 P 3
RECOVERY
040665 P 4 052834 P 27
RELEASE RATE
065101 P 46
REPORT, ENVIRONMENTAL
075246 P 54
RESEARCH CONTRACT
044763 P 21
RESEARCH, GOVERNMENT
065087 P 46
RESEARCH, INDUSTRY
067143 P 50
RESPIRATION
042769 P 14 043154 P 17 064727 P 32 064783 P 45
RETENTION
040780 P 8 043593 P 20 051748 P 27 064764 P 42
065101 P 46 071505 P 53 075319 P 54 077006 P 55
RETENTION FUNCTION
045046 P 21 049587 P 23 049588 P 23 049600 P 23
049604 P 24 049684 P 24 056181 P 29 058835 P 30
062623 P 31 064747 P 36 064756 P 39 064758 P 40
064773 P 44 064777 P 44 064778 P 44 064783 P 45
067023 P 48 067124 P 50 067165 P 51
REVIEW
042769 P 14 049712 P 25 049714 P 25 053417 P 28
064740 P 34 064753 P 38 064754 P 38 064759 P 40
064760 P 40 064764 P 42 064765 P 42 064766 P 42
064777 P 44 064778 P 44 067088 P 49 068619 P 51
069508 P 52
RIVER
057579 P 30
RIVER, COLUMBIA
065087 P 46
RNA
040664 P 3 040671 P 5 040679 P 6 040779 P 8
040787 P 9 041574 P 10 041895 P 13 041899 P 13
064737 P 33 064743 P 35 064758 P 40 064762 P 41

RUTHENIUM
075309 P 54 081542 P 57
SAMPLING
043102 P 16 043358 P 19
SAVANNAH RIVER PLANT
049713 P 25 073994 P 53
SEDIMENT
079184 P 56 081542 P 57
SENSITIVITY ANALYSIS
069507 P 52
SIMULATION
069935 P 52
SITING
066269 P 48
SKIN
041892 P 12 044225 P 20 049639 P 24 051628 P 27
061721 P 31 062623 P 31 064727 P 32 064728 P 32
064750 P 37 064754 P 38 064758 P 40 064762 P 41
064778 P 44 065935 P 47 075281 P 54
SOCIO/PHILOSOPHICAL CONSIDERATION
077191 P 55
SODIUM
043246 P 18 077006 P 55
SOIL
027023 P 2 040781 P 8 043154 P 17 069396 P 51
SOIL PROPERTY, IN SITU
065087 P 46 079184 P 56
SOIL, NUCLIDE OCCURRENCE
045087 P 22 069508 P 52 079184 P 56
SOIL, RADIONUCLIDE MOVEMENT THROUGH
028688 P 3 081542 P 57
SOLID
040669 P 4
SOLVENT EXTRACTION PROCESS
064762 P 41
SOURCE, POINT
064739 P 34
SOUTH AFRICA
061130 P 31
SPECIFIC ACTIVITY
012939 P 1 040671 P 5 040780 P 8 040784 P 9
045046 P 21 064738 P 34 064745 P 35 064746 P 36
064752 P 38 064763 P 41 064765 P 42 064777 P 44
064781 P 45 067123 P 49 067124 P 50 069935 P 52
SPECTROMETRY, BETA
040792 P 10
SPECTROMETRY, GAMMA
013818 P 1
SPERM
064741 P 35 067143 P 50
SPLEEN
049533 P 23 049587 P 23 049588 P 23 049600 P 23
049713 P 25 056181 P 29 058835 P 30 062623 P 31
064726 P 32 064728 P 32 064735 P 33 064738 P 34
064744 P 35 064748 P 36 064756 P 39 064758 P 40
064761 P 41 064762 P 41 064771 P 43 067133 P 50
SPOKESMAN, UTILITY
044109 P 20
STABILITY
064726 P 32
STEROID
049588 P 23 064751 P 37
STOMACH
043104 P 16 064738 P 34 064748 P 36 064754 P 38
064756 P 39 064778 P 44 067124 P 50
STRATOSPHERE
043106 P 17
STRONTIUM
048349 P 22 061130 P 31 066272 P 48 075309 P 54
075321 P 55 081542 P 57
SULFIDE
043104 P 16
SULFUR
077006 P 55
SURFACE CONTAMINATION
045087 P 22
SURFACE WATER, DISPOSAL MEDIA
069508 P 52
SURVEY, ENVIRONMENT
082903 P 58
SURVEY, USPHS
064779 P 45
SYSTEM ANALYSIS
075319 P 54
TEMPERATURE
043182 P 18 043359 P 19 049607 P 24 065659 P 47
077006 P 55 079194 P 56
TEST, WEAPONS
077191 P 55
TESTING
045087 P 22 051314 P 26
TESTIS
040789 P 10 041894 P 12 042766 P 14 049533 P 23
049587 P 23 049588 P 23 049600 P 23 049684 P 24
056181 P 29 058835 P 30 061130 P 31 062623 P 31
064735 P 33 064741 P 35 064744 P 35 064754 P 38
064756 P 39 064757 P 39 064758 P 40 064778 P 44
067122 P 49
THEORETICAL INVESTIGATION
044225 P 20
THERAPY
043152 P 17
THERMAL CONSIDERATION
049607 P 24 064727 P 32
THERMAL POLLUTION
044378 P 21 044471 P 21 065087 P 46 066269 P 48
080624 P 56 081340 P 56
THYMIDINE
049587 P 23 049714 P 25 051967 P 27 051968 P 27
051975 P 27 052180 P 27 052834 P 27 054673 P 28
054728 P 28 058835 P 30 064726 P 32 064735 P 33
064736 P 33 064737 P 33 064738 P 34 064739 P 34
064740 P 34 064741 P 35 064743 P 35 064744 P 35
064745 P 35 064746 P 36 064747 P 36 064748 P 36
064749 P 37 064750 P 37 064751 P 37 064753 P 38
064754 P 38 064755 P 39 064756 P 39 064757 P 39
064758 P 40 064759 P 40 064760 P 40 064761 P 41
064762 P 41 064764 P 42 064765 P 42 064771 P 43
064772 P 43
THYMUS
049533 P 23 049587 P 23 049588 P 23 054897 P 28
062623 P 31 064728 P 32 064743 P 35 064744 P 35
064756 P 39 064761 P 41
THYROID
049600 P 23 064738 P 34 064778 P 44
TOXICITY
040675 P 6 040678 P 6 040785 P 9 040786 P 9
040788 P 9 043180 P 18 049639 P 24 049714 P 25
058835 P 30 062623 P 31 064728 P 32 064740 P 34
064741 P 35 064746 P 36 064752 P 38 064753 P 38
064755 P 39 064757 P 39 064758 P 40 064759 P 40
064770 P 43 064771 P 43 064772 P 43 064777 P 44
072215 P 53
TRACE ELEMENT
066272 P 48
TRACER
051582 P 27 052980 P 28 067023 P 48
TRACER, RADIOACTIVE
016938 P 1 043103 P 16 043591 P 20 044225 P 20
069396 P 51 077006 P 55
TRACHEA
064754 P 38
TRANSFER FUNCTION
041894 P 12
TRANSPIRATION
037402 P 3 069396 P 51
TRANSPORT
041892 P 12 042769 P 14 042770 P 14 043304 P 19
051309 P 26 069396 P 51
TRANSPORT THEORY
043086 P 15
TROPHIC LEVEL
042770 P 14
TUMOR
040668 P 4 040778 P 7 049714 P 25 051967 P 27
054673 P 28 064735 P 33 064746 P 36
TURNOVER RATE
042767 P 14 043101 P 16 043103 P 16 043180 P 18
043182 P 18 043591 P 20 043593 P 20 049222 P 22
051582 P 27 064754 P 38 064756 P 39 064763 P 41
064765 P 42 064777 P 44 064781 P 45
ULTRAVIOLET
040682 P 7 067143 P 50
UNITED KINGDOM
075321 P 55
UNITED NATIONS
077006 P 55
UTERUS
041894 P 12 043364 P 19 049639 P 24 064738 P 34
064757 P 39
VAPOR EXCHANGE
037402 P 3 074536 P 53
VARIABILITY
064745 P 35 064751 P 37 064779 P 45 064783 P 45
VEGETATION
028688 P 3 042769 P 14 043154 P 17 045087 P 22
051226 P 26 051228 P 26 051309 P 26 051313 P 26
051314 P 26 069396 P 51 069508 P 52 082903 P 58
VIRUS
040683 P 7
WASTE DISPOSAL
065087 P 46

WASTE DISPOSAL, ATMOSPHERIC
061721 P 31
WASTE DISPOSAL, LIQUID
069508 P 52
WASTE DISPOSAL, OCEAN
075321 P 55
WASTE DISPOSAL, RIVER
075309 P 54 079184 P 56
WASTE DISPOSAL, TERRESTRIAL
079184 P 56 082903 P 58
WASTE HANDLING
079184 P 56
WASTE TREATMENT
066272 P 48 077191 P 55 081542 P 57
WASTE TREATMENT, LIQUID
079184 P 56
WASTE, SEWAGE
079184 P 56
WATER
037402 P 3 041892 P 12 042765 P 14 042767 P 14
042769 P 14 042770 P 14 042852 P 15 043103 P 16
043180 P 18 043182 P 18 043246 P 18 043358 P 19
043364 P 19 043591 P 20 043593 P 20 044225 P 20
049604 P 24 051226 P 26 051309 P 26 051313 P 26
051573 P 26 056179 P 29 061100 P 30 062623 P 31
064727 P 32 064747 P 36 064749 P 37 064766 P 42
064770 P 43 064777 P 44 064778 P 44 064781 P 45
065122 P 47 065163 P 47 067088 P 49 067123 P 49
067124 P 50 067165 P 51 069396 P 51 071505 P 53
077200 P 55 082345 P 57
WATER QUALITY
079184 P 56
WATER TREATMENT
079184 P 56
WATER VAPOR
037402 P 3 070396 P 52
WATER, DRINKING
041887 P 11 049684 P 24 061721 P 31 064757 P 39
064779 P 45 065122 P 47 067088 P 49 075309 P 54
079184 P 56
WATER, IRRIGATION
075309 P 54
WEEK
064726 P 32 064747 P 36 064762 P 41
WHOLE BODY
043103 P 16 043180 P 18 043182 P 18 043358 P 19
043364 P 19 043591 P 20 043593 P 20 049604 P 24
056179 P 29 062623 P 31 064766 P 42 064773 P 44
064777 P 44 064779 P 45 068619 P 51
WINDSCALE
075321 P 55
X-RAY
013818 P 1 043155 P 18
XENON
042765 P 14 066272 P 48 068619 P 51
YEAR
064735 P 33 064779 P 45 067124 P 50
YOUNG
056179 P 29
YTTRIUM
048349 P 22
ZINC
018273 P 1 043104 P 16 051573 P 26 064773 P 44
065087 P 46 066269 P 48 075309 P 54
ZOOPLANKTON
075321 P 55

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

AEBERHARDT A
043104 P 16
ANAND RS
041887 P 11
ANSPAUGH LR
037402 P 3 070396 P 52
ANTONELLI A
075309 P 54
APPLETON TC
040669 P 4
ARGUELLO M
040670 P 5
ASCHBACHER PW
043358 P 19
ASSCHE J
042769 P 14
AVTANDILOV GG
043365 P 19
BAKER NF
041887 P 11
BALLOU JE
067124 P 50
BARREIRA F
051965 P 27
BARTON CJ
055111 P 29
BASERGA R
051967 P 27 064735 P 33 064738 P 34
BASSHAM JA
042770 P 14
BASSON JK
061130 P 31
BATEMAN AJ
051968 P 27
BECKER CD
081340 P 56
BEHKI RM
051975 P 27
BENNETT BG
071505 P 53
BERENDES HD
041893 P 12
BERGER EY
042765 P 14
BEROCHE M
042767 P 14
BERRY RJ
064746 P 36
BIANCHI PA
064760 P 40
BIDDULPH O
051223 P 26
BIERI JG
067133 P 50
BIGHAMI R
040667 P 4
BILKIEWICZ J
062253 P 31
BISHOP CC
041895 P 13
BITTEL, R
057579 P 30
BLACK AL
041887 P 11
BLAYLOCK, BG
079184 P 56
BLUM MK
041888 P 11
BOCKRATH RC
040779 P 8
BOELUEKBASI EK
040783 P 8
BOMBACE MA
075309 P 54
BOND VP
040776 P 7 049714 P 25
BOYD JB
041893 P 12
BREWEN JG
040681 P 6 040790 P 10
BRYAND BJ
040775 P 7
BRYANT BJ
064726 P 32
BUGRYSHEV PF
040678 P 6
BURTON RM
056181 P 29
BUTLER MM
055111 P 29
CAHILL DF
049533 P 23 065122 P 47
CARLOUGH M
064745 P 35
CARROLL TE
075246 P 54
CARTER MW
064779 P 45 077191 P 55
CASARETT AP
082373 P 57
CHANANA AD
040675 P 6
CHIPPERFIELD B
049600 P 23
CHIRKOVA EN
043365 P 19 067165 P 51
CHORNEY W
054625 P 28
CHRETIEN J
040670 P 5
CIGNA AA
075309 P 54
CIGNA R
075309 P 54
CLARKE DA
049588 P 23
CLEAVER JE
041574 P 10 064764 P 42 064765 P 42
CLEGG B
069396 P 51
CLIFTON RJ
049587 P 23 067623 P 31
CLINE JF
051228 P 26
COLVIN MC
047885 P 22 047898 P 22 065935 P 47
COMAR CL
068619 P 51
CORFY JC
027023 P 2
COSTES C
042767 P 14 042769 P 14
COTTIER H
064762 P 41
CRAGLE RG
043358 P 19
CRANE WA
064751 P 37
CRATHORN AR
064760 P 40
CRIPPA M
040667 P 4
CRONKITE EP
040675 P 6 064741 P 35 064747 P 36 064748 P 3
064759 P 40 064762 P 41
CROWN CW
041890 P 12
CUMMING RB
055111 P 29
D'SOUZA TS
081542 P 57
DAVIDSON RS
075246 P 54
DELONG CW
051628 P 27
DEROCHE M
042769 P 14
DEVIK F
064758 P 40
DEVLIN PG
041888 P 11
DEWEY WC
064772 P 43
DOUXFILS N
040670 P 5
DREW PM
052180 P 27
DUNN A
067023 P 48
ELWOOD JW

012939 P 1
ERICKSON RC
026846 P 2
ET. AL
079184 P 56
EVANS AG
049713 P 25
EVERS J
043103 P 16
FEINENDEGEN LE
040776 P 7 040784 P 9 040785 P 9 040786 P
040787 P 9 040788 P 9 049714 P 25
FERBEL B
064745 P 35
FERRON F
042767 P 14 042769 P 14
FISK PA
041887 P 11
FLIEDNER TM
064747 P 36 064759 P 40
FOY JM
043187 P 18
FOY, JM
049722 P 22
FRIEDMAN I
043592 P 20
FUNK FD
040683 P 7
FURCHNER J
054914 P 28
FURCHNER JE
064773 P 44
GAGE RS
051225 P 26
GALAND P
040670 P 5
GARDER KH
064758 P 40
GARNER RJ
068619 P 51
GILL JE
041895 P 13
GOLDFEDER A
054673 P 28
GREENBERG ML
040675 P 6
GREENHAM LW
041890 P 12
GREENWAY GG
040664 P 3 064770 P 43
GREULICH RC
064757 P 39
GRIEDER A
064767 P 41
GUILD WR
064749 P 37
HADLEY G
069396 P 51
HAKONSON TE
082345 P 57 082903 P 58
HANAWALT PC
044763 P 21
HARRISON FL
045046 P 21 069935 P 52
HATCH FT
040664 P 3 041895 P 13 060607 P 30 064770 P
067122 P 49 067123 P 49
HEDDLE HA
040673 P 5
HETENYI G
064763 P 41
HILL TJ
041890 P 12
HINRICHS HR
064738 P 34
HODGES TK
043086 P 15 051309 P 26
HOFER KG
072215 P 53
HOFFMAN J
064755 P 39
HOLLWEG S
040668 P 4
HOLT LA
067143 P 50
HOUSE CR
043092 P 15
HUGHES WL
064739 P 34 072215 P 53
HUMPHREY RM
064772 P 43
ISTOMINA AG
040678 P 6 043364 P 19 049639 P 24
JARVIS P
043092 P 15
JAWOROWSKI Z
062253 P 31
JOHNSON BC
050527 P 25
JOHNSON HA
064741 P 35 064753 P 38
JOHNSON LJ
082345 P 57 082903 P 58
JONES RA
064772 P 43
JORDAN CF
028688 P 3
JORDAN, CF
056628 P 29
JUNGAS RL
064769 P 42
KAMAL TH
043358 P 19
KANZAKI G
042765 P 14
KAPLAN WD
040789 P 10
KAUFMAN SL
065935 P 47
KELLER S
064748 P 36
KHOROBRYKH VV
049607 P 24
KIGOSHI K
043102 P 16 043106 P 17
KILLMANN SA
064759 P 40
KING FJ
064743 P 35
KING V
041892 P 12
KIRCHMANN R
064781 P 45 065163 P 47 074536 P 53 075319 P 5
081542 P 57
KISIELESKI WE
064735 P 33
KLINE JR
028688 P 3 067798 P 51
KLINE, JR
056628 P 29
KLOFT W
043105 P 17
KOCH AL
041889 P 11
KORANDA J
069396 P 51
KORANDA JJ
023154 P 2 037402 P 3 040664 P 3 040781 P
045046 P 21 060607 P 30 064770 P 43 069508 P 5
069935 P 52 070396 P 52
KORANDA, JJ
054628 P 29
KOZOLL OD
056179 P 29
KRAUSE MO
040671 P 5
KRICHEVSKY MI
043592 P 20
LAFONTAINE A
064781 P 45 065163 P 47
LAJTHA LG
064740 P 34
LAMBERT BF
049587 P 23 062623 P 31
LAMERTON LF
064756 P 39
LANFRI U
075309 P 54
LANGHAM WH
043593 P 20 064727 P 32 064728 P 32 064773 P 4
LAPSON CE
044471 P 21
LE GRAND J
061771 P 31
LEAVITT VD
045087 P 22
LERLOND CP
064754 P 38
LEROUTON AV
040792 P 10

LEE WR
040680 P 6
LEHR JJ
081542 P 57
LEMBECK F
043152 P 17
LENNARTZ KJ
040668 P 4
LIEBERMAN R
065935 P 47
LISCO H
064735 P 33
LONG C
064743 P 35
LOOMFS RS
064751 P 37
LORD BI
054728 P 28
LYAGINSKAYA AM
042766 P 14 043364 P 19 049639 P 24
MAINGUET P
040670 P 5
MAK D
064763 P 41
MAKSYMOWYCH R
041888 P 11
MARIN G
041899 P 13
MARTIN JR
037402 P 3 060607 P 30 069508 P 52 070396 P
MARTIN R
065659 P 47
MARTIN, JR
056628 P 29
MASON BJ
045087 P 22
MAURER W
040668 P 4
MAZRIMAS JA
040664 P 3 041895 P 13 060607 P 30 064770 P
067122 P 49 067123 P 49
MCCARTHY C
041901 P 13
MCGREGOR DD
041891 P 12
MCLEISH J
064736 P 33
MCMANUS WP
042852 P 15
MCMILLAN RC
065935 P 47
MEEK ES
041890 P 12
MEUNUER J
043104 P 16
MEWISSEN DJ
040778 P 7
MEYER KA
056179 P 29
MIGHISSI AA
064779 P 45
MILLIGAN B
067143 P 50
MINDER W
060933 P 31
MOFFAT GH
064750 P 37
MOGHISSI AA
047885 P 22 047898 P 22 065935 P 47 077191 P
078468 P 56
MONESI V
040667 P 4
MOORE JL
040664 P 3 064770 P 43
MOORE R
064783 P 45
MORGAN RA
082373 P 57
MOSER MH
043246 P 18
MOSKALEV YI
075281 P 54
MYERS DK
064761 P 41
NELSON VA
066269 P 48
NELSON, V
018273 P 1
NESTER EW
041901 P 13
NEWELL HF
043592 P 20
NIFSAR KH
043101 P 16
NYMAN JW
082903 P 58
OCKEY CH
041900 P 13
ODARTCHENKO N
064762 P 41
ODUM HT
021312 P 2
OFTEDAL P
040789 P 10
OLIVER R
064740 P 34 064746 P 36
OLIVIERI A
040780 P 8
OLIVIERI G
040780 P 8 040790 P 10
ONEAL D
043154 P 17
ORDIN L
051313 P 26
OSBORNE RV
067088 P 49
PACHLER PF
040666 P 4
PATZER RG
049684 P 24 078468 P 56
PEACOCK DB
041890 P 12
PEACOCK WJ
040681 P 6
PEAKE LR
067133 P 50
PECKIKYAN FR
042765 P 14
PELC SR
040669 P 4 043093 P 16 064744 P 35 064750 P 3
PERROTTA CA
064745 P 35
PERSON S
040779 P 8
PETERSEN RD
064738 P 34
PETRUCHENIA MV
042852 P 15
PHILLIPS SL
040682 P 7
PILGRIM C
040668 P 4
PINSON EA
044225 P 20 064727 P 32 064728 P 32
PITT WW
079184 P 56
PLAMONDON JF
042770 P 14
PLANFT J
061721 P 31
PLOTT WF, ET AL.
078468 P 56
POST J
064755 P 39 064771 P 43
PRICHARD RK
042852 P 15
PURTYMUN WD
082345 P 57
QUASTEL MR
052834 P 27
QUASTLER H
064745 P 35 064752 P 38
RACHMELER M
053555 P 28
RAKER C
042852 P 15
RAM S
064761 P 41
RANEY F
043304 P 19
RANEY FC
051226 P 26
REHNBERG BF
047885 P 22 047898 P 22 065935 P 47
REID BL
041894 P 12
REISKIN AB
064746 P 36
REMY J
043104 P 16

RICHMOND CR
043593 P 20 051573 P 26 064773 P 44
ROBERTSON OE
080624 P 56
ROBERTSON JS
064739 P 34
ROBINSON DW
043246 P 18
ROBISON WL
070396 P 52
ROHWER PS
040645 P 4 055111 P 29
ROSENTHAL GM
061100 P 30 067798 P 51
RUBINI JR
064748 P 36 064759 P 40
RUDOLPH AW
075246 P 54
RUNINI JR
064747 P 36
SAMIS HV
064752 P 38
SAWYER B
064737 P 33
SCHEUERMANN W
040791 P 10
SCHIFFER LM
040675 P 6
SCHINDLER P
064762 P 41
SCHLOERG PP
043246 P 18
SCHNIEDEN, H
049227 P 22
SCHULZE FF
043105 P 17
SEREBRYAKOV NG
067165 P 51
SEWING KF
043152 P 17
SEYMOUR AH
048349 P 22
SHAW FI
058835 P 30
SHERMAN FG
064752 P 38
SHOOTER KV
064760 P 40
SIRI W
043103 P 16
SISLER FD
043592 P 20
SKAUEN DM
043088 P 15 043180 P 18 053417 P 28
SKOUGAARD MR
064745 P 35
SLATER TF
064737 P 33
SMITH TF
064766 P 42
SOLOMON AK
052980 P 28
SOOD MA
056181 P 29
SPALDING JF
051314 P 26
SPERRY WM
064743 P 35
STANDEVEN RM
049588 P 23
STEEL GG
064756 P 39
STEIN OL
040782 P 8
STEWART GL
073994 P 53
STEWART ML
061100 P 30 067798 P 51
STEWART PA
064745 P 35
STRAHS S
067033 P 48
STRAND JA
065088 P 46 065955 P 48 081340 P 56
STRAULI U
064737 P 33
STRYCKMANS PA
040675 P 6
SUNDERLAND N
064736 P 33
TAEGDER K
040791 P 10
TANGEN EG
065088 P 46 065955 P 48
TAYLOR RT
064766 P 42
TEMPLETON WL
065088 P 46 065955 P 48 080624 P 56 081340 P 5
THOMPSON RC
043591 P 20 049604 P 24 051582 P 27 051748 P 2
064777 P 44 064778 P 44 067124 P 50
TOMIKURA Y
043106 P 17
TRUJILLO TT
043593 P 20 051402 P 26
TUCKER JS
069935 P 52
UDEKWU FAO
056179 P 29
ULRIKSON GU
079184 P 56
UZZAN G
061721 P 31
VAADIA Y
043086 P 15 043304 P 19
VAN ASSCHE J
042767 P 14
VAN DEN HOEK J
064781 P 45 074536 P 53 075319 P 54
VANAS D
061130 P 31
VANDENHOEK J
065163 P 47
VANDERHORST JR
080624 P 56
VANDERWESTHUSIZEN
061130 P 31
VAUBERT, B
057579 P 30
VAUGHAN BE
065087 P 46
VENNART J
049712 P 25
VLEGGAAR CM
061130 P 31
WADE L
058835 P 30
WALDEN SJ
069507 P 52
WALKER BE
064754 P 38
WEGENER KJ
040668 P 4
WELTON MGE
043093 P 16
WESTON RE
077200 P 55
WHEELER JK
047885 P 22 047898 P 22
WIMBER DE
053130 P 28
WINRER DP
064745 P 35
WINDMUELLI HG
067133 P 50
WINNE D
043152 P 17
WIPPER WJ
045087 P 22
WITTMER G
043274 P 18
WOCHOK ZS
041888 P 11
WOLFF S
040673 P 5
WOLFSBERG MF
064745 P 35
WOOD BJB
051589 P 27
WOOD L
064748 P 36
WOODHEAD DS
075321 P 55
WOODS FW
043154 P 17
WOOLLEY JT
043359 P 19
WORMAN FCV
054897 P 28
WULFF VJ

064752 P 38
YUILE CL
049533 P 23
ZAJDELA F
040674 P 5
ZHURAVLEV VF
040678 P 6 042766 P 14
ZYLICZ E
062253 P 31

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN THE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE. * INDICATES END OF TITLE.)

EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS* #CHROMATID
WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL
LABELED THYMIDINE* #THE KINETICS OF CHROMATID
IN THE ROOT SYSTEM OF HELIANTHUS ANNUUS IN THE PRESENCE AND
#RADIATION EFFECTS UPON WATER
BY BEAN PLANTS.* #
#PERCUTANEOUS
* #THE INFLUENCE OF 5-HYDROXYTRYPTAMINE ON THE
#PERCUTANEOUS
#EFFECT OF SEASON AND TEMPERATURE ON PERCUTANEOUS
OF #INFLUENCE OF DRUGS ON INTESTINAL CIRCULATION AND THE
OF ALPHA- AND GAMMA-TOCOPHEROLS #COMPARISON OF INTESTINAL
ESCHERICHIA COLI* #EVIDENCE FOR A MUTAGENIC LOCAL EFFECT
FISH AND RADIATION EFFECT* #
RABBIT ORGANISM AFTER PROLONGED #DYNAMICS OF THE
ON EMBRYOGENESIS OF FISH AND FIXATION AND LONG-TERM
DOSES RESULTING FROM ADMINISTRATION OF TRITIATED FOLIC
#INCORPORATION OF TRITIATED THYMIDINE INTO DEOXYRIBONUCLEIC
TRITIATED WATER* #GLYCOLIC
WATER (T7599)* #FATTY
OF THE CELL-CYCLE AND TIME OF SYNTHESIS OF DEOXYRIBONUCLEIC
CAUSED BY THE USE OF RADIOACTIVE PRECURSORS OF NUCLEIC
FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC
OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO
THE SKIN TO DEUTERATED #A STUDY OF THE MECHANISM OF WATER
#TRANSFER OF WATER AND ELECTROLYTES
STRUCTURE. THE EFFECT OF XENON ON TRITIATED WATER FLUX
MAMMALIAN CELLS.* #
OF TWO LOCI IN E. COLI WWU - A STUDY OF RADIATION
YOUNG AND OLD MICE (T2675)* #EFFECT OF SPECIFIC
#RADIATION DOSE DUE TO
#FATTY ACID SYNTHESIS IN
OF MICE (T2297)* #DELETERIOUS INFLUENCE OF ORALLY
#INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL
AS A PRECURSOR OF DNA UNDER CONDITIONS OF PROLONGED
TRITIATED WATER* #TRITIUM SECRETION INTO COW'S MILK AFTER
#ESTIMATION OF RADIATION DOSES TO TISSUES AFTER
IN THE RAT* #RADIATION DOSES RESULTING FROM
#TISSUE DOSES FROM CHRONIC
IN THE AQUEOUS PHASE OF THE RABBIT ORGANISM AFTER PROLONGED
THYMIDINE AND GAMMA IRRADIATION ON THE MORTALITY OF THE
IN THE 3H-INDEX AND THE MITOTIC INDEX IN CELL TYPES OF
FOR ITS INCORPORATION INTO A CYTOPLASMIC COMPONENT OF THE
CLIFFS NUCLEAR POWER PLANTS* #
#RADIOACTIVE FALLOUT OVER SOUTH
TRITIATED WATER* #TRITIUM SECRETION INTO COW'S MILK
RAT* #ESTIMATION OF RADIATION DOSES TO TISSUES
#INCORPORATION OF TRITIATED THYMIDINE INTO DNA
THYMIDINE IN CELLS AND ITS INCORP INTO DNA (T1858A)* #DELAY
HEAVY HYDROGEN IN THE AQUEOUS PHASE OF THE RABBIT ORGANISM
#RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS
CHROMOSOMES IN ESCHERICHIA COLI GROWING AT LOW #EVIDENCE
#SEMINAR ON THE PROTECTION
RAT PITUITARY (T4647)* #EFFECT OF
#TRITIATED THYMIDINE AS A CYTOCIDAL
OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS
#TRITIUM INCORPORATION IN
EFFECTS OF TRITIATED WATER (THO) ON ROOT-TIP MERISTEMS OF
LYMPH AND PLASMA TRANSPORT, AND TISSUE UPTAKE OF
ESCHERICHIA COLI GROWING AT LOW RATES*#EVIDENCE AGAINST THE
NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED
WITH TRITIATED WATER. II. CRITICAL STUDY OF TECHNIQUES FOR
OF RADIATION EFFECTS (T1252)* #FOUR-FACTOR MODEL
USING THO, P-32, AND C-14.* #AN
ON TRITIATED WATER FLUX ACROSS THE GUT* #
T7609)* #REVIEW OF LABORATORY
#USE OF RADIOISOTOPES IN RESEARCH IN
TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN
#ISOTOPE STUDIES ON THE PHYSIOLOGY OF DOMESTIC
AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND
RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO
#DISTRIBUTION OF TRITIATED THYMIDINE IN
#TRITIATION OF
#TRITIATION OF
#TRITIATION OF AQUATIC
#TRITIATION OF AQUATIC
#ESTIMATION OF WATER CONTENT BY TRITIUM DILUTION OF
OF TRITIATED WATER IN THE ROOT SYSTEM OF HELIANTHUS

ABERATIONS RESULTING FROM 3H-THYMIDINE INCORPORATION INTO 041900 P 13
ABERRATIONS (T7605)* OF TRITIATED THYMIDINE, TRITIATED 064772 P 43
ABERRATIONS INDUCED IN CHINESE HAMSTER CELLS BY TRITIUM- 040790 P 10
ABSENCE OF TRANSPORTATION* #MOVEMENT OF TRITIATED WATER 043304 P 19
ABSORPTION AND EXCRETION IN THE RAT* 040665 P 4
ABSORPTION AND METABOLISM OF TRITIUM OXIDE AND TRITIUM GAS 051228 P 26
ABSORPTION BY RATS OF TRITIUM FROM A LUMINOUS COMPOUND* 047885 P 22
ABSORPTION OF TRITIATED WATER FROM THE INTESTINE OF THE RAT 043152 P 17
ABSORPTION OF TRITIUM OXIDE.* 051628 P 27
ABSORPTION OF TRITIUM OXIDE* 049607 P 24
ABSORPTION OF TRITIUM-LABELED WATER IN THE SMALL INTESTINE 041886 P 11
ABSORPTION, LYMPH AND PLASMA TRANSPORT, AND TISSUE UPTAKE 067133 P 50
ACCOMPANYING THE DECAY OF INCORPORATED TRITIUM IN 040779 P 8
ACCUMULATION AND RETENTION OF TRITIUM IN EMBRYO AND LARVAL 065955 P 48
ACCUMULATION OF HEAVY HYDROGEN IN THE AQUEOUS PHASE OF THE 043365 P 19
ACCUMULATION OF TRITIUM IN AN EXPERIMENTAL AQUATIC 065088 P 46
ACID AND TRITIATED WATER IN THE RAT* #RADIATION 062623 P 31
ACID BY ISOLATED NUCLEI.* 051975 P 27
ACID LABELING DURING PHOTOSYNTHESIS WITH C(14)O2 AND 042770 P 14
ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED 064769 P 43
ACID USING TRITIATED THYMIDINE AND AUTORADIOGRAPHY.* 054673 P 28
ACID* #NUCLEAR RADIOLESIONS 040674 P 5
ACIDS (T2297)* #INCORPORATION OF TRITIUM 064766 P 42
ACIDS* #TOXICITY OF TRITIUM-LABELED NUCLEOSIDES 040785 P 9
ACROSS FROG SKIN BY A COMPARISON OF THE PERMEABILITY OF 041892 P 12
ACROSS GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS* 043246 P 18
ACROSS THE GUT* #ANESTHETIC GASES AND WATER 042765 P 14
ACTION OF TRITIATED THYMIDINE ON THE CLONAL GROWTH OF 052180 P 27
ACTION ON THE GENE* #THE CHARACTERIZATION OF REVERTANTS 040682 P 7
ACTIVITY OF H3-CYTIDINE ON ITS INCORP INTO TISSUES OF 064752 P 38
ACUTE INTAKE OF TRITIUM BY MAN* 071505 P 53
ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)* 064769 P 43
ADMINISTERED TRITIATED THYMIDINE ON REPRODUCTIVE CAPACITY 064757 P 39
ADMINISTRATION (T2243)* 064748 P 36
ADMINISTRATION (T7590)*#SPECIFICITY OF TRITIATED THYMIDINE 064762 P 41
ADMINISTRATION OF ORGANICALLY BOUND TRITIUM AND OF 075319 P 54
ADMINISTRATION OF TRITIATED CORTICOSTEROIDS TO THE RAT* 049588 P 23
ADMINISTRATION OF TRITIATED FOLIC ACID AND TRITIATED WATER 062623 P 31
ADMINISTRATION OF TRITIUM OXIDE TO RABBITS* 067165 P 51
ADMINISTRATION OF TRITIUM OXIDE* OF HEAVY HYDROGEN 043365 P 19
ADULT DROSOPHILA MELANOGASTER LARVAE (PART II)* TRITIATED 040783 P 8
ADULT MICE, RAT FETUSES, ASCITES TUMOR CELLS* FLUCTUATIONS 040668 P 4
ADULT TESTIS OF DROSOPHILA MELANOGASTER* AND EVIDENCE 040789 P 10
AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT 038641 P 3
AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 31
AFTER ADMINISTRATION OF ORGANICALLY BOUND TRITIUM AND OF 075319 P 54
AFTER ADMINISTRATION OF TRITIATED CORTICOSTEROIDS TO THE 049588 P 23
AFTER ORAL ADMINISTRATION (T2243)* 064748 P 36
AFTER PLUCKING OF HAIRS BETWEEN THE APPEARANCE OF H3- 064750 P 37
AFTER PROLONGED ADMINISTRATION OF TRITIUM OXIDE* OF 043365 P 19
AFTER TRITIUM OXIDE IGENSTION* 049684 P 24
AGAINST THE ALTERNATION OF SYNTHESIS OF IDENTICAL 040666 P 4
AGAINST THE DANGERS OF TRITIUM* 013458 P 1
AGE, SEX, HORMONAL STATE ON TRITIATED THYMIDINE UPTAKE BY 064751 P 37
AGENT IN HUMAN LEUKEMIA* 040675 P 6
ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31, 1972* 082903 P 58
ALGAE AND TRANSFER IN SIMPLE AQUATIC FOOD CHAINS* 061100 P 30
ALLIUM CEPA L* #CYTOLOGICAL 043274 P 18
ALPHA- AND GAMMA-TOCOPHEROLS IN RAT (T2788)* ABSORPTION, 067133 P 50
ALTERNATION OF SYNTHESIS OF IDENTICAL CHROMOSOMES IN 040666 P 4
AMINO ACIDS* #TOXICITY OF TRITIUM-LABELED 040785 P 9
ANALYSIS AND MEASUREMENT OF RADIOACTIVITY OF WATER AND 042767 P 14
ANALYSIS OF THYMIDINE INCORP INTO MOUSE DNA AND MECHANISM 064745 P 35
ANALYSIS OF TRANSLOCATION IN THE PHLOEM OF THE BEAN PLANT 051223 P 26
ANESTHETIC GASES AND WATER STRUCTURE. THE EFFECT OF XENON 042765 P 14
ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF TRITIUM (064777 P 44
ANIMAL METABOLISM.* 050527 P 25
ANIMAL RESEARCH* #LABORATORY 016938 P 1
ANIMALS (HPIS/133)* 077006 P 55
ANIMALS (T2297)* TOXICITY AND USE IN STUDY OF GROWTH RATES 064759 P 40
ANIMALS AND MAN* #TRANSFER OF 068619 P 51
ANIMALS AS SHOWN BY WATER-SOLUBLE AUTORADIOGRAPHY* 040669 P 4
ANIMALS FROM TRITIATED WATER (CONTD) (T7734)* 067123 P 49
ANIMALS FROM TRITIATED WATER (T7734)* 067122 P 49
ANIMALS IN AN EXPERIMENTAL FRESHWATER POOL* 045046 P 21
ANIMALS IN AN EXPERIMENTAL MARINE POOL* 069935 P 52
ANIMALS SUBJECTED TO RAPID LIVE-WEIGHT CHANGES* 042852 P 15
ANNUUS IN THE PRESENCE AND ABSENCE OF TRANSPORTATION* 043304 P 19

DNA (T1858A)* #DELAY AFTER PLUCKING OF HAIRS BETWEEN THE
OF A PACIFIC OYSTER* #COLUMBIA RIVER STUDIES 1969-1970,
ENVIRONMENTAL RADIOCONTAMINATION* #THE
#
#TRITIATION OF
#TRITIATION OF
AND LONG-TERM ACCUMULATION OF TRITIUM IN AN EXPERIMENTAL
#TRITIUM INCORPORATION IN ALGAE AND TRANSFER IN SIMPLE
1964* #THE EFFECTS OF TRITIUM OXIDE ON
#THE EFFECTS OF TRITIUM OXIDE ON
#APPLIED
#DYNAMICS OF THE ACCUMULATION OF HEAVY HYDROGEN IN THE
INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE
FROM SELECTED LOCATIONS IN THE UNITED STATES, INCLUDING
#RADIOAUTOGRAPHY OF TRITIATED PHOTOSYNTHATE
#TRITIATED THYMIDINE
#HAZARD OF TRITIUM
#SOME EFFECTS OF TRITIATED THYMIDINE
#EFFECTS OF H3-THYMIDINE
ADMINISTRATION (T7590)* #SPECIFICITY OF TRITIATED THYMIDINE
BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA)
#TRITIATED WATER
#STUDIES OF METABOLIC TURNOVER WITH TRITIUM
#STUDIES OF METABOLIC TURNOVER WITH TRITIUM
DEUTERIUM.* #STUDIES OF METABOLIC TURNOVER WITH TRITIUM
#THE APPLICABILITY OF THE HONEYBEE
#DIFFUSION OF TRITIATED WATER INTO ROOTS
INITIATION, #PROGRESS REPORT ON USE OF TRITIATED THYMIDINE
#THE STAGE OF CHROMOSOME DUPLICATION IN THE CELL CYCLE
#DISTRIBUTION OF TRITIATED THYMIDINE IN ANIMALS
#WATER EXCHANGE AND BARRIERS
#3H-2-GLUCOSE
CONSTITUENTS IN #STUDIES OF METABOLIC TURNOVER WITH TRITIUM
THE MITOTIC INDEX IN CELL TYPES OF ADULT MICE, RAT FETUSES,
#ECOLOGICAL
- DOSIMETRIC, RADIOLOGICAL AND RADIATION PROTECTION
- DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION
#HEALTH IMPLICATIONS OF
LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, #
THE 3H-INDEX AND THE MITOTIC INDEX IN CELL TYPES OF ADULT #
GASTROINTESTINAL TRACT OF MAN* #IN VITRO
#QUANTITATIVE EVALUATION OF TRITIUM IN
OF DEOXYRIBONUCLEIC ACID USING TRITIATED THYMIDINE AND
OF TRITIATED THYMIDINE IN ANIMALS AS SHOWN BY WATER-SOLUBLE
THE INFLUENCE OF DIETARY FAT ON THE INCORPORATION OF T2O IN

APPEARANCE OF H3-THYMIDINE IN CELLS AND ITS INCORP INTO 064750 P 37
APPENDIX, EFFECTS OF TEMPERATURE AND RADIATION UPON LARVAE 018273 P 1
APPLICABILITY OF THE HONEYBEE AS AN INDICATOR OF 082345 P 57
APPLIED AQUATIC STUDIES* 079184 P 56
AQUATIC ANIMALS IN AN EXPERIMENTAL FRESHWATER POOL* 045046 P 21
AQUATIC ANIMALS IN AN EXPERIMENTAL MARINE POOL* 069935 P 52
AQUATIC ENVIRONMENT* ON EMBRYOGENESIS OF FISH AND FIXATION 065088 P 46
AQUATIC FOOD CHAINS* 061100 P 30
AQUATIC ORGANISMS. FINAL REPORT, JUNE 1, 1962 - JULY 31, 043180 P 18
AQUATIC ORGANISMS* 043088 P 15
AQUATIC STUDIES* 079184 P 56
AQUEOUS PHASE OF THE RABBIT ORGANISM AFTER PROLONGED 043365 P 19
AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH 082903 P 58
AREAS NEAR NUCLEAR FACILITIES* #TRITIUM IN PINE TREES 073994 P 52
ARISING FROM HTO.* 051225 P 26
AS A CYTOCIDAL AGENT IN HUMAN LEUKEMIA* 040675 P 6
AS A DNA LABEL IN MAN (T1858)* 064740 P 34
AS A DNA LABEL IN RAT LIVER (T2297)* 064755 P 39
AS A DNA LABEL IN RAT LIVER (T2297)* 064771 P 43
AS A PRECURSOR OF DNA UNDER CONDITIONS OF PROLONGED 064762 P 41
AS A TEST SYSTEM.* BIOLOGICAL EFFECTIVENESS OF TRITIUM 051314 P 26
AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 17
AS A TRACER. GROSS STUDIES ON THE MOUSE* 043591 P 20
AS A TRACER. I. GROSS STUDIES ON THE MOUSE* 049604 P 24
AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND 051582 P 27
AS AN INDICATOR OF ENVIRONMENTAL RADIOCONTAMINATION* 082345 P 57
AS INFLUENCED BY WATER STATUS OF TISSUE.* 051313 P 26
AS INTERNAL SOURCE OF RADIATION IN STUDY OF LATERAL ROOT 040782 P 8
AS REVEALED BY X-RAY BREAKAGE AND 3H-THYMIDINE LABELING* 040667 P 4
AS SHOWN BY WATER-SOLUBLE AUTORADIOGRAPHY* 040669 P 4
AS STUDIED BY THE USE OF HYDROGEN ISOTOPES* 044225 P 21
AS TRACER IN TURNOVER STUDIES (T7591)* 064763 P 41
AS TRACER. 5. PREDOMINANTLY NON-DYNAMIC STATE OF BODY 067124 P 50
ASCITES TUMOR CELLS* FLUCTUATIONS IN THE 3H-INDEX AND 040668 P 4
ASPECTS OF TRITIUM BEHAVIOR IN THE ENVIRONMENT* 065101 P 46
ASPECTS* #INTRANUCLEAR 3H THYMIDINE 040776 P 7
ASPECTS* #INTRANUCLEAR H-3 THYMIDINE 049714 P 25
ATMOSPHERIC DISCHARGE OF TRITIATED WATER* 061721 P 31
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR 066272 P 48
AUTORADIOGRAPHIC INVESTIGATION OF DIURNAL FLUCTUATIONS IN 040668 P 4
AUTORADIOGRAPHIC STUDIES OF CELL PROLIFERATION IN THE 040670 P 5
AUTORADIOGRAPHY AND RADIOCHEMISTRY* 043093 P 16
AUTORADIOGRAPHY.* OF THE CELL-CYCLE AND TIME OF SYNTHESIS 054673 P 28
AUTORADIOGRAPHY* #DISTRIBUTION 040669 P 4
AVIAN TISSUES* # 043101 P 16

THE DIFFERENCE BETWEEN THE LETHAL EFFECTS OF H3 AND P32 IN
#LETHALITY AND MUTATIONS PRODUCED BY TRITIUM DECAY IN
#CALVERT CLIFFS,
#WATER EXCHANGE AND
#AN ANALYSIS OF TRANSLOCATION IN THE PHLOEM OF THE
AND METABOLISM OF TRITIUM OXIDE AND TRITIUM GAS BY
EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD
EFFECT OF TRANSMUTATION IN DROSOPHILA AND THE HONEY
#TRITIUM
#ECOLOGICAL ASPECTS OF TRITIUM
REPORT 1971, CENTRE D'ETUDE DE LENERGIE NUCLEAIRE, MOL (
#
MICE.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM
#THE QUALITY FACTOR FOR LOW-ENERGY
C-14 (T2333)* #REPRODUCTIVE DEATH OF MAMMALIAN CELLS DUE TO
TEST #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM
INCORP INTO DNA (T1858A)* #DELAY AFTER PLUCKING OF HAIRS
COMPOUND WITH THAT OF TRITIATED WATER IN RATS #COMPARISON
#ON THE DIFFERENCE
OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION -
1965* #
SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE
THE BROAD BEAN ROOT (VICIA FABA) AS A TEST #THE RELATIVE
UPTAKE IN RATS.* #THE RELATIVE
MOUSE EMBRYOS* #THE RELATIVE
TRITIUM GAS.* #
+ Y-90 ON THE LARVAE OF THE PACIFIC OYSTER, ESTIMATION OF
THAT OF TRITIATED WATER IN RATS AND #COMPARISON BETWEEN THE
GUINEA-PIG AND RABBIT UNDER TROPICAL CONDITIONS AND #THE
AND THE EFFECT OF CLIMATE AND SALINE DRINKING ON THE
IN THE RAT, CAT, RABBIT, GUINEA PIG, AND MAN, AND OF THE
#LONG-TERM EVALUATION OF THE
USE OF TRACERS.* #THE KINETICS OF
DETERMINATION OF THE CELL-CYCLE AND TIME OF SYNTHESIS OF #
#
#TRITIUM EXCHANGE IN
#KINETICS OF TRITIUM IN
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS
ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES,

BACTERIA* #ON 041889 P 11
BACTERIOPHAGES* 040683 P 7
BALTIMORE GAS AND ELECTRIC CO.* 044109 P 20
BARRIERS AS STUDIED BY THE USE OF HYDROGEN ISOTOPES* 044225 P 21
BEAN PLANT USING THO, P-32, AND C-14.* 051223 P 26
BEAN PLANTS.* #ABSORPTION 051228 P 26
BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.* BIOLOGICAL 051314 P 26
BEE* #A QUANTITATIVE STUDY OF THE MUTAGENIC 040680 P 6
BEHAVIOR IN FISH FROM A CHRONICALLY CONTAMINATED LAKE* 012939 P 1
BEHAVIOR IN THE ENVIRONMENT* 065101 P 46
BELGIUM)* #ANNUAL SCIENTIFIC 081542 P 57
BETA HISTORADIOGRAPHY WITH TRITIUM.* 051965 P 27
BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN 054897 P 28
BETA-EMITTERS* 049712 P 25
BETA-RADIATION FROM INCORPO THYMIDINE LABELED WITH H-3 OR 064746 P 36
BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A 051314 P 26
BETWEEN THE APPEARANCE OF H3-THYMIDINE IN CELLS AND ITS 064750 P 37
BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS 047898 P 22
BETWEEN THE LETHAL EFFECTS OF H3 AND P32 IN BACTERIA* 041889 P 11
BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF 042769 P 14
BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 013818 P 1
BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING 054897 P 28
BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH 051314 P 26
BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON 054914 P 28
BIOLOGICAL EFFECTIVENESS OF TRITRIUM ON PREIMPLANTATION 082373 P 57
BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF 051402 P 26
BIOLOGICAL HALF-LIFE FOR ZN IN OYSTER* Y-90, AND SR-90 048349 P 22
BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH 047898 P 22
BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE MOUSE, RAT, 043192 P 18
BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE RAT* 043182 P 18
BIOLOGICAL HALF-LIFE OF TRITIUM IN MAN* TRITIUM SPACE) 049222 P 22
BIOLOGICAL HALF-LIFE OF TRITIUM* 064779 P 45
BIOLOGICAL PROCESSES. SPECIAL PROBLEMS CONNECTED WITH THE 052980 P 28
BIOLOGICAL PROPERTIES AND RADIOSENSITIVITY OF TUMOURS. 054673 P 28
BIOLOGICAL STUDY OF A TRITIATED LUMINOUS PAINT* 043104 P 16
BIOLOGICAL SYSTEMS* 043103 P 16
BIOLOGICAL SYSTEMS* 077200 P 55
BIOLOGICAL UPTAKE* 061130 P 31
BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 066272 P 48

#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 53
#INDUCTION OF LEUKEMIA IN THE C57 BL MOUSE BY MEANS OF TRITIATED THYMIDINE* 040778 P 7
TRITIUM AS TRACER. 5. PREDOMINANTLY NON-DYNAMIC STATE OF BODY CONSTITUENTS IN RAT (T7735)* METABOLIC TURNOVER WITH 067124 P 50
EXPOSURE TO TRITIUM OXIDE* #EFFECT OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF 064778 P 44
RABBIT, GUINEA PIG, AND MAN, AND OF #ESTIMATION OF TOTAL BODY WATER (VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, 049222 P 22
WATER* #TOTAL BODY WATER ESTIMATIONS IN DAIRY CATTLE USING TRITIATED 043358 P 19
GASTROENTERITIS* # BODY WATER TURNOVER IN CATTLE WITH PARASITIC 041887 P 11
#DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE* 056179 P 29
PROLIFERATION IN NORMAL AND CONTINUOUSLY IRRADIATED RAT BONE MARROW STUDIED BY REPEATED LABELLING WITH TRITIATED 054728 P 28
INTO COW'S MILK AFTER ADMINISTRATION OF ORGANICALLY BOUND TRITIUM AND OF TRITIATED WATER* #TRITIUM SECRETION 075319 P 54
#CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (T1510)* 064743 P 35
DUPLICATION IN THE CELL CYCLE AS REVEALED BY X-RAY BREAKAGE AND 3H-THYMIDINE LABELING*THE STAGE OF CHROMOSOME 040667 P 4
BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.* RELATIVE 051314 P 26
PUERTO RICO, PERTINENT TO CONSIDERATION OF #HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, 021312 P 2
ACROSS GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS* #TRANSFER OF WATER AND ELECTROLYTES 043246 P 18

#GLYCOLIC ACID LABELING DURING PHOTOSYNTHESIS WITH C(14)O2 AND TRITIATED WATER* 042770 P 14
BETA-RADIATION FROM INCORPD THYMIDINE LABELED WITH H-3 OR C-14 (T2333)*#REPRODUCTIVE DEATH OF MAMMALIAN CELLS DUE TO 064746 P 36
IN THE PHLOEM OF THE BEAN PLANT USING THO, P-32, AND C-14.* #AN ANALYSIS OF TRANSLOCATION 051223 P 26
#LABELING OF DNA AND CELL DIVISION IN SO CALLED NON-DIVIDING TISSUES* 064744 P 35
#AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* 038641 P 3
CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 20
AND HEALTH PHYSICS DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY 066272 P 48
#TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4- 049600 P 23
OF ORALLY ADMINISTERED TRITIATED THYMIDINE ON REPRODUCTIVE CAPACITY OF MICE (T2297)* #DELETERIOUS INFLUENCE 064757 P 39
#INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* 064766 P 42
#RADIATION EFFECTS OF CARBON-14 AND TRITIUM ON GROWTH OF SOYBEANS.* 054625 P 28
#TRITIUM AND CARBON-14 IN THE TREE RINGS* 043106 P 17
#NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* 043102 P 16
OF TOTAL BODY WATER (VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, RABBIT, GUINEA PIG, AND MAN, AND OF THE BIOLOGICAL 049222 P 22
#THE TRITIUM RATE EFFECT IN TYROSINASE- CATALYZED HYDROXYLATION.* 051589 P 27
LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS* BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED 047898 P 22
#TOTAL BODY WATER ESTIMATIONS IN DAIRY CATTLE USING TRITIATED WATER* 043358 P 19
#BODY WATER TURNOVER IN CATTLE WITH PARASITIC GASTROENTERITIS* 041887 P 11
* #NUCLEAR RADIOLESIONS CAUSED BY THE USE OF RADIOACTIVE PRECURSORS OF NUCLEIC ACID 040674 P 5
LABELING* #THE STAGE OF CHROMOSOME DUPLICATION IN THE CELL CYCLE AS REVEALED BY X-RAY BREAKAGE AND 3H-THYMIDINE 040667 P 4
#LABELING OF DNA AND CELL DIVISION IN SO CALLED NON-DIVIDING TISSUES* 064744 P 35
#DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)* 064753 P 38
#RENEWAL OF CELL POPULATIONS (T2693)* 064754 P 38
#IN VITRO AUTORADIOGRAPHIC STUDIES OF CELL PROLIFERATION IN THE GASTROINTESTINAL TRACT OF MAN* 040670 P 5
FLUCTUATIONS IN THE 3H-INDEX AND THE MITOTIC INDEX IN CELL TYPES OF ADULT MICE, RAT FETUSES, ASCITES TUMOR CELLS* 040668 P 4
AND RADIOSENSITIVITY OF TUMOURS. DETERMINATION OF THE CELL-CYCLE AND TIME OF SYNTHESIS OF DEOXYRIBONUCLEIC ACID 054673 P 28
PLUCKING OF HAIRS BETWEEN THE APPEARANCE OF H3-THYMIDINE IN CELLS AND ITS INCORP INTO DNA (T1858A)* #DELAY AFTER 064750 P 37
OF CHROMATID ABERRATIONS INDUCED IN CHINESE HAMSTER CELLS BY TRITIUM-LABELED THYMIDINE* #THE KINETICS 040790 P 10
WITH H-3 OR C-14 (T2333)* #REPRODUCTIVE DEATH OF MAMMALIAN CELLS DUE TO BETA-RADIATION FROM INCORPD THYMIDINE LABELED 064746 P 36
#THYMIDINE METABOLISM AND H3 THYMIDINE SUICIDE IN MAMMALIAN CELLS* 041574 P 11
#3H THYMIDINE CORPORATION INTO NUCLEAR DNA OF LEAF CELLS* 041888 P 11
#LETHALITY FROM 3H-NUCLEOSIDES INCORPORATED IN MAMMALIAN CELLS* 041899 P 13
ON DAN, RNA, AND PROTEIN SYNTHETIC RATES IN SYNCHRONIZED L- CELLS* #TRITIATED THYMIDINE EFFECTS 040671 P 5
IN CELL TYPES OF ADULT MICE, RAT FETUSES, ASCITES TUMOR CELLS* FLUCTUATIONS IN THE 3H-INDEX AND THE MITOTIC INDEX 040668 P 4
OF TRITIATED THYMIDINE ON THE CLONAL GROWTH OF MAMMALIAN CELLS.* #ACTION 052180 P 27
IRRADIATED RAT BONE MARROW STUDIED BY REPEATED LABELLING # CELLULAR PROLIFERATION IN NORMAL AND CONTINUOUSLY 054728 P 28
#PHYSICS OF CELLULAR SYNTHESIS, GROWTH, AND DIVISION* 040679 P 6
#ANNUAL SCIENTIFIC REPORT 1971, CENTRE D'ETUDE DE LENERGIE NUCLEAIRE, MOL (BELGIUM)* 081542 P 57
OF TRITIATED WATER (THO) ON ROOT-TIP MERISTEMS OF ALLIUM CEPA L* #CYTOLOGICAL EFFECTS 043274 P 18
AND EXCRETION OF TRITIUM LABELED CEREBROSIDES (GALACTOSYL CERAMIDE) RADIOACTIVITY BY MONKEYS* #DISTRIBUTION 056181 P 29
* #DISTRIBUTION AND EXCRETION OF TRITIUM LABELED CEREBROSIDES (GALACTOSYL CERAMIDE) RADIOACTIVITY BY MONKEYS 056181 P 29
VAPOR* #DOSE TO MAN VIA FOOD- CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER 070396 P 52
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 53
INCORPORATION IN ALGAE AND TRANSFER IN SIMPLE AQUATIC FOOD CHAINS* #TRITIUM 061100 P 30
PHYSICS DIVISION, #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH 066272 P 48
TRITIUM DILUTION OF ANIMALS SUBJECTED TO RAPID LIVE-WEIGHT CHANGES* #ESTIMATION OF WATER CONTENT BY 042852 P 15
A STUDY OF RADIATION ACTION ON THE GENE* #THE CHARACTERIZATION OF REVERTANTS OF TWO LOCI IN E. COLI WWU - 040682 P 7
CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (T1510)* 064743 P 35
OF DNA IN HIGHER PLANTS BY FEULGEN PHOTOMETRY AND CHEMICAL METHODS (T1858)* #MEASUREMENTS 064736 P 33
#THE KINETICS OF CHROMATID ABERRATIONS INDUCED IN CHINESE HAMSTER CELLS BY TRITIUM-LABELED THYMIDINE* 040790 P 10
WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS.* TRANSPORT OF RADIOCHLORIDE AND TRITIATED 051309 P 26
WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS* TRANSPORT OF RADIONCHLORIDE AND TRITIATED 043086 P 15
INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN # CHROMATID ABERATIONS RESULTING FROM 3H-THYMIDINE 041900 P 13
TRITIUM-LABELED THYMIDINE* #THE KINETICS OF CHROMATID ABERRATIONS INDUCED IN CHINESE HAMSTER CELLS BY 040790 P 10
#EFFECT OF TRITIATED THYMIDINE ON SISTER- CHROMATID EXCHANGE IN A RING CHROMOSOME* 040681 P 6
H-3 -THYMIDINE OR X-RAYS* #THE FREQUENCY OF SISTER CHROMATID EXCHANGES FOLLOWING EXPOSURE TO VARYING DOSES OF 043155 P 18
TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (T7605)* OF TRITIATED THYMIDINE, 064772 P 43
RAY BREAKAGE AND 3H-THYMIDINE LABELING* #THE STAGE OF CHROMOSOME DUPLICATION IN THE CELL CYCLE AS REVEALED BY X- 040667 P 4
#SOME CHROMOSOME STUDIES WITH TRITIATED THYMIDINE* 040673 P 5
TRITIATED THYMIDINE ON SISTER-CHROMATID EXCHANGE IN A RING CHROMOSOME* #EFFECT OF 040681 P 6
#EVIDENCE AGAINST THE ALTERNATION OF SYNTHESIS OF IDENTICAL CHROMOSOMES IN ESCHERICHIA COLI GROWING AT LOW RATES* 040666 P 4
#TISSUE DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE TO RABBITS* 067165 P 51
RETICULATE, THE GUPPY* #THE EFFECTS OF CHRONIC IRRADIATION BY TRITIATED WATER ON POECILIA 026846 P 2
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 049713 P 25
#TRITIUM BEHAVIOR IN FISH FROM A CHRONICALLY CONTAMINATED LAKE* 012939 P 1
THE SMALL INTESTINE OF #INFLUENCE OF DRUGS ON INTESTINAL CIRCULATION AND THE ABSORPTION OF TRITIUM-LABELED WATER IN 041886 P 11
#AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* 038641 P 3
#CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 20
PIG AND RABBIT UNDER TROPICAL CONDITIONS AND THE EFFECT OF CLIMATE AND SALINE DRINKING ON THE BIOLOGICAL HALF-LIFE OF 043182 P 18

#ACTION OF TRITIATED THYMIDINE ON THE CLONAL GROWTH OF MAMMALIAN CELLS.* 052180 P 27
#CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 20
#COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (064772 P 43
OF SYNTHESIS OF IDENTICAL CHROMOSOMES IN ESCHERICHIA COLI GROWING AT LOW RATES*EVIDENCE AGAINST THE ALTERNATION 040666 P 4
#THE CHARACTERIZATION OF REVERTANTS OF TWO LOCI IN E. COLI WWU - A STUDY OF RADIATION ACTION ON THE GENE* 040682 P 7
THE DECAY OF INCORPORATED TRITIUM IN ESCHERICHIA COLI* #EVIDENCE FOR A MUTAGENIC LOCAL EFFECT ACCOMPANYING 040779 P 8
TEMPERATURE AND RADIATION UPON LARVAE OF A PACIFIC OYSTER* # COLUMBIA RIVER STUDIES 1969-1970, APPENDIX, EFFECTS OF 018273 P 1
CLIFFS NUCLEAR POWER PLANTS* #AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT 038641 P 3
OF RADIOACTIVITY IN THE MARINE ENVIRONMENT AND THE DOSE COMMITMENT TO MARINE ORGANISMS* #LEVELS 075321 P 55
COMPARATIVE METABOLISM OF TRITIATED WATER BY MAMMALS* 043593 P 20
OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.* #STUDIES 051582 P 27
LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND # COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED 047898 P 22
IN WATER (MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND 064773 P 44
IN WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 051573 P 26
RAT* # COMPARISON OF HTO IN PLASMA AND EXPIRED WATER VAPOR* 064783 P 45
TRANSPORT, AND TISSUE UPTAKE OF ALPHA- AND GAMMA- # COMPARISON OF H3- AND C14-GLUCOSE METABOLISM IN THE INTACT 067023 P 48
#A STUDY OF THE MECHANISM OF WATER ACROSS FROG SKIN BY A # COMPARISON OF INTESTINAL ABSORPTION, LYMPH AND PLASMA 067133 P 50
COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (COMPARISON OF THE PERMEABILITY OF THE SKIN TO DEUTERATED 041892 P 12
PERTINENT TO CONSIDERATION OF TRITIUM #HYDROGEN BUDGET AND COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND 064772 P 43
AND EVIDENCE FOR ITS INCORPORATION INTO A CYTOPLASMIC COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, 021312 P 2
#CHEMICAL COMPONENT OF THE ADULT TESTIS OF DROSOPHILA MELANOGASTER* 040789 P 10
BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOSITION OF BRAIN, LIVER, PANCREAS (T1510)* 064743 P 35
#PERCUTANEOUS ABSORPTION BY RATS OF TRITIUM FROM A LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS* 047898 P 22
#RADIATION DECOMPOSITION OF TRITIUM-LABELED COMPOUND* 047885 P 22
#INVESTIGATION OF TRITIATED LUMINOUS COMPOUNDS* 040784 P 9
#TRITIUM - DISCRIMINATION AND COMPOUNDS* 065935 P 47
RECENT YEARS* #NATURAL CONCENTRATION IN FRESH WATER MICROCOSMS* 067798 P 51
INTERSPECIES #ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN 043102 P 16
#BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM 051573 P 26
CORRELATIONS. I. COMPARISON OF ESTD #EST OF MAX PERMISSIBLE CONCENTRATIONS OF TRITIUM GAS.* 051402 P 26
IN THE MOUSE, RAT, GUINEA-PIG AND RABBIT UNDER TROPICAL CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM INTERSPECIES 064773 P 44
DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS AND THE EFFECT OF CLIMATE AND SALINE DRINKING 043182 P 18
OF TRITIATED THYMIDINE AS A PRECURSOR OF DNA UNDER CONDITIONS NATURELLES* #TRANSFER ET INCORP 064781 P 45
INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS OF PROLONGED ADMINISTRATION (T7590)*SPECIFICITY 064762 P 41
EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONDITIONS* #TRANSFER AND 065163 P 47
POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS OF THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL 044471 P 21
#THE KINETICS OF BIOLOGICAL PROCESSES. SPECIAL PROBLEMS CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC 044471 P 21
IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONNECTED WITH THE USE OF TRACERS.* 052980 P 28
NATURELLES* #TRANSFER ET INCORP DU TRITIUM DANS LES CONSIDERATION OF TRITIUM METABOLISM* AND COMPARTMENTS 021312 P 2
AS TRACER. 5. PREDOMINANTLY NON-DYNAMIC STATE OF BODY CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS 064781 P 45
#TRITIUM BEHAVIOR IN FISH FROM A CHRONICALLY CONSTITUENTS IN RAT (T7735)* TURNOVER WITH TRITIUM 067124 P 50
#INTERNAL CONTAMINATED LAKE* 012939 P 1
#THE HAZARD FROM TRITIUM CONTAMINATION WITH TRITIUM* 060933 P 31
#TRITIATION OF ANIMALS FROM TRITIATED WATER (CONTAMINATION* 057579 P 30
LIVE-WEIGHT CHANGES* #ESTIMATION OF WATER CONTO) (T7734)* 067123 P 49
#DNA AND RNA CONTENT BY TRITIUM DILUTION OF ANIMALS SUBJECTED TO RAPID 042852 P 15
#SOME EFFECTS ON MAMMALIAN DEVELOPMENT OF CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 33
STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE # CONTINUOUS IRRADIATION IN UTERO WITH TRITIATED WATER* 065122 P 47
#USE OF TRITIATED WATER (THO) FOR CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A 052834 P 28
REPEATED LABELLING #CELLULAR PROLIFERATION IN NORMAL AND CONTINUOUS REGISTRATION OF INSECT TRANSPIRATION* 043105 P 17
TO EVAPORATION AT THE SOIL SURFACE* # CONTINUOUSLY IRRADIATED RAT BONE MARROW STUDIED BY 054728 P 28
TO FOOD ITEMS FROM TRITIATED METHANE USED FOR DOMESTIC CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL 027023 P 2
#3H THYMIDINE COOKING* #TRITIUM TRANSFER 078468 P 56
MICROMETEOROLOGICAL VARIABLES* #A SYSTEM FOR CORPORATION INTO NUCLEAR DNA OF LEAF CELLS* 041888 P 11
CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM INTERSPECIES CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH 069396 P 51
OF RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES 064773 P 44
DOSES TO TISSUES AFTER ADMINISTRATION OF TRITIATED CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED 051573 P 26
THYMYDINE* #RADIOAUTOGRAPHIC PROCESSING SEQUENCE FOR CORTICOSTEROIDS TO THE RAT* #ESTIMATION OF RADIATION 049588 P 23
TRITIUM AND OF TRITIATED WATER* #TRITIUM SECRETION INTO COVERSLIP MONOLAYER TISSUE CULTURES LABELED WITH TRITIATED 041890 P 12
AND TEMPERATURE ON THE LARVAE OF THE PACIFIC OYSTER, COW*S MILK AFTER ADMINISTRATION OF ORGANICALLY BOUND 075319 P 54
#RESIDUAL TRITIUM AT SEDAN CRASSOSTREA GIGAS* #EFFECTS OF IONIZING RADIATION 066269 P 48
ON LIVER DNA IN TRITIATED KANGAROO RAT LIVING AT SEDAN CRATER* 023154 P 2
ON LIVER DNA IN TRITIATED KANGAROO RATS LIVING AT SEDAN CRATER* #STUDIES 040664 P 3
TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. II. CRATER* #STUDIES 064770 P 43
PROCESSING SEQUENCE FOR COVERSLIP MONOLAYER TISSUE CRITICAL STUDY OF TECHNIQUES FOR ANALYSIS AND MEASUREMENT 042767 P 14
AND RADIOSENSITIVITY OF TUMOURS. DETERMINATION OF THE CELL- CULTURES LABELED WITH TRITIATED THYMYDINE*RADIOAUTOGRAPHIC 041890 P 12
LABELING* #THE STAGE OF CHROMOSOME DUPLICATION IN THE CELL CYCLE AND TIME OF SYNTHESIS OF DEOXYRIBONUCLEIC ACID USING 054672 P 28
T26751* #EFFECT OF SPECIFIC ACTIVITY OF H3- CYCLE AS REVEALED BY X-RAY BREAKAGE AND 3H-THYMIDINE 040667 P 4
#TRITIATED THYMIDINE AS A CYTIDINE ON ITS INCORP INTO TISSUES OF YOUNG AND OLD MICE (064752 P 38
MERISTEMS OF ALLIUM CEPA L* # CYTOCIDAL AGENT IN HUMAN LEUKEMIA* 040675 P 6
THYMIDINE AND EVIDENCE FOR ITS INCORPORATION INTO A CYTOLOGICAL EFFECTS OF TRITIATED WATER (THO) ON ROOT-TIP 043274 P 18
#COMPARISON OF H3- AND CYTOPLASMIC COMPONENT OF THE ADULT TESTIS OF DROSOPHILA 040789 P 10
#INDUCTION OF LEUKEMIA IN THE C14-GLUCOSE METABOLISM IN THE INTACT RAT* 067023 P 48
C57 BL MOUSE BY MEANS OF TRITIATED THYMIDINE* 040778 P 7

#ANNUAL SCIENTIFIC REPORT 1971, CENTRE D*ETUDE DE LENERGIE NUCLEAIRE, MOL (BELGIUM)* 081542 P 57
#TOTAL BODY WATER ESTIMATIONS IN DAIRY CATTLE USING TRITIATED WATER* 043358 P 19
OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED 052834 P 28
#PROGRESS REPORT ON REAPAIR OF DAMAGED DNA IN VIVO* 044763 P 21
CELLS* #TRITIATED THYMIDINE EFFECTS ON DAN, RNA, AND PROTEIN SYNTHETIC RATES IN SYNCHRONIZED L- 040671 P 5
#SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM* 013458 P 1
NATURELLES* #TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS 064781 P 45
#RADIATION EFFECTS POLY- DAT FROM INTRAMOLECULAR TRITIUM* 041895 P 13
#TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES* 064781 P 45
#ANNUAL SCIENTIFIC REPORT 1971, CENTRE D*ETUDE DE LENERGIE NUCLEAIRE, MOL (BELGIUM)* 081542 P 57

INCORPD THYMIDINE LABELED WITH H-3 OR C-14 (#REPRODUCTIVE
#LETHALITY AND MUTATIONS PRODUCED BY TRITIUM
#EVIDENCE FOR A MUTAGENIC LOCAL EFFECT ACCOMPANYING THE
31, 1966.* #THE EFFECTS OF TRITIUM
#EFFECTS OF TRITIUM
#RADIATION
#THYMIDINE METABOLISM - PATHWAYS OF INCORPORATION AND
THYMIDINE IN CELLS AND ITS INCORP INTO DNA (T1858A)* #
THYMIDINE ON REPRODUCTIVE CAPACITY OF MICE (T2297)* #
#INCORPORATION OF TRITIATED THYMIDINE INTO
DETERMINATION OF THE CELL-CYCLE AND TIME OF SYNTHESIS OF
#THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN
#CONTRIBUTION OF TRITIATED WATER AT VARIOUS
#BIOLOGICAL PROPERTIES AND RADIOSENSITIVITY OF TUMOURS.
#
SKIN BY A COMPARISON OF THE PERMEABILITY OF THE SKIN TO
FORMATION IN A MARINE PSEUDOMONAD* #
AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND
#THE INFLUENCE OF
BACTERIA* #ON THE
AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF
AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF
WATER STATUS OF TISSUE.* #
#ESTIMATION OF WATER CONTENT BY TRITIUM
PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL
SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY
#ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE
#HEALTH IMPLICATIONS OF ATMOSPHERIC
#TRITIUM -
#INACTIVATION OF TRANSFORMING DNA BY TRITIUM
TRITIUM OXIDE* #EFFECT OF BODY
(GALACTOSYL CERAMIDE) RADIOACTIVITY BY MONKEYS* #
WATER-SOLUBLE AUTORADIOGRAPHY* #
#MOVEMENT AND
INDEX IN CELL TYPES OF #AUTORADIOGRAPHIC INVESTIGATION OF
#LABELING OF DNA AND CELL DIVISION IN SO CALLED NON-
#BIOLOGICAL AND MEDICAL RESEARCH
#LABELING OF DNA AND CELL
#PHYSICS OF CELLULAR SYNTHESIS, GROWTH, AND
RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS
THE APPEARANCE OF H3-THYMIDINE IN CELLS AND ITS INCORP INTO
#INCORPORATION OF TRITIATED THYMIDINE INTO
#LABELING OF
#FOUR-FACTOR MODEL ANALYSIS OF THYMIDINE INCORP INTO MOUSE
T1858)* #
#INACTIVATION OF TRANSFORMING
METHODS (T1858)* #MEASUREMENTS OF
#STUDIES ON LIVER
#STUDIES ON LIVER
#PROGRESS REPORT ON REAPAIR OF DAMAGED
#HAZARD OF TRITIUM AS A
#SOME EFFECTS OF TRITIATED THYMIDINE AS A
#EFFECTS OF H3-THYMIDINE AS A
#3H THYMIDINE CORPORATION INTO NUCLEAR
#INCORPORATION OF THYMIDINE INTO
#STUDIES ON INCORP OF TRITIATED THYMIDINE IN
#SPECIFICITY OF TRITIATED THYMIDINE AS A PRECURSOR OF
#EFFECTS OF TRITIUM DECAY ON
USE OF TRITIUM-LABELED THYMIDINE IN STUDIES ON SYNTHESIS OF
#THE EFFECTS OF TRITIUM DECAY ON
#ISOTOPE STUDIES ON THE PHYSIOLOGY OF
TRANSFER TO FOOD ITEMS FROM TRITIATED METHANE USED FOR
#LEVELS OF RADIOACTIVITY IN THE MARINE ENVIRONMENT AND THE
#RADIATION
#NEW
OXIDE IGENSTION* #RADIATION
RADIORESISTANCE #CONTINUOUS IRRADIATION OF THE RAT AT HIGH
EXPOSURE TO TRITIATED WATER VAPOR* #
#
RABBITS* #TISSUE
1,4-NAPHTHAQUINOL #TRITIUM UPTAKE HALF-LIVES AND RADIATION
OF SISTER CHROMATID EXCHANGES FOLLOWING EXPOSURE TO VARYING
ACID AND TRITIATED WATER IN THE RAT* #RADIATION
BY THE RAT* #RADIATION
CORTICOSTEROIDS TO THE RAT* #ESTIMATION OF RADIATION
ASPECTS* #INTRANUCLEAR H-3 THYMIDINE -
#INTRANUCLEAR 3H THYMIDINE -
TROPICAL CONDITIONS AND THE EFFECT OF CLIMATE AND SALINE
STUDY OF THE MUTAGENIC EFFECT OF TRANSMUTATION IN
OF POLYTENE NUCLEI ISOLATED FROM SALIVARY GLANDS OF
AND GAMMA IRRADIATION ON THE MORTALITY OF THE ADULT
INTO A CYTOPLASMIC COMPONENT OF THE ADULT TESTIS OF
#THE MUTAGENIC EFFECT OF TRITIATED URIDINE IN
TRITIUM-LABELED WATER IN THE SMALL INTESTINE #INFLUENCE OF
ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET
CONDITIONS NATURELLES* #TRANSFER ET INCORP
#RADIATION DOSE
H-3 OR C-14 (T2333)* #REPRODUCTIVE DEATH OF MAMMALIAN CELLS

DEATH OF MAMMALIAN CELLS DUE TO BETA-RADIATION FROM 064746 P 36
DECAY IN BACTERIOPHAGES* 040683 P 7
DECAY OF INCORPORATED TRITIUM IN ESCHERICHIA COLI* 040779 P 8
DECAY ON DNA. PROGRESS REPORT, JUNE 1, 1966 TO DECEMBER 053555 P 28
DECAY ON DNA* 065659 P 47
DECOMPOSITION OF TRITIUM-LABELED COMPOUNDS* 040784 P 9
DEGRADATION* 064764 P 42
DELAY AFTER PLUCKING OF HAIRS BETWEEN THE APPEARANCE OF H3- 064750 P 37
DELETERIOUS INFLUENCE OF ORALLY ADMINISTERED TRITIATED 064757 P 39
DEOXYRIBONUCLEIC ACID BY ISOLATED NUCLEI.* 051975 P 27
DEOXYRIBONUCLEIC ACID USING TRITIATED THYMIDINE AND 054673 P 28
DEPRESSING IRON UPTAKE IN RATS.* 054914 P 28
DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE* 027023 P 2
DETERMINATION OF THE CELL-CYCLE AND TIME OF SYNTHESIS OF 054673 P 28
DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE* 056179 P 29
DEUTERATED AND TRITIATED WATER* OF WATER ACROSS FROG 041892 P 12
DEUTERIUM FRACTIONATION DURING MOLECULAR HYDROGEN 043592 P 20
DEUTERIUM.* #STUDIES OF METABOLIC TURNOVER WITH TRITIUM 051582 P 27
DIETARY FAT ON THE INCORPORATION OF T2O IN AVIAN TISSUES* 043101 P 16
DIFFERENCE BETWEEN THE LETHAL EFFECTS OF H3 AND P32 IN 041889 P 11
DIFFERENT CHLORIDE STATUS.* AND TRANSPORT OF RADIOCHLORIDE 051309 P 26
DIFFERENT CHLORIDE STATUS* AND TRANSPORT OF RADIONCHLORIDE 043086 P 15
DIFFUSION OF TRITIATED WATER INTO ROOTS AS INFLUENCED BY 051313 P 26
DILUTION OF ANIMALS SUBJECTED TO RAPID LIVE-WEIGHT CHANGES* 042852 P 15
DIPHOSPHATE* HALF-LIVES AND RADIATION DOSES OF CANCER 049600 P 23
DISC ELECTROPHORESIS* #LIQUID SCINTILLATION 040792 P 10
DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 082903 P 58
DISCHARGE OF TRITIATED WATER* 061721 P 31
DISCRIMINATION AND CONCENTRATION IN FRESH WATER MICROCOSMS* 067798 P 51
DISINTEGRATIONS IN VIVO* 041901 P 13
DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO 064778 P 44
DISTRIBUTION AND EXCRETION OF TRITIUM LABELED CEREBROSIDES 056181 P 29
DISTRIBUTION OF TRITIATED THYMIDINE IN ANIMALS AS SHOWN BY 040669 P 4
DISTRIBUTION OF TRITIATED WATER IN PLANTS.* 051226 P 26
DIURINAL FLUCTUATIONS IN THE 3H-INDEX AND THE MITOTIC 040668 P 4
DIVIDING TISSUES* 064744 P 35
DIVISION ANNUAL REPORT, 1965* 013818 P 1
DIVISION IN SO CALLED NON-DIVIDING TISSUES* 064744 P 35
DIVISION* 040679 P 6
DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*LIMITED, CHALK 066272 P 48
DNA (T1858A)* #DELAY AFTER PLUCKING OF HAIRS BETWEEN 064750 P 37
DNA AFTER ORAL ADMINISTRATION (T2243)* 064748 P 36
DNA AND CELL DIVISION IN SO CALLED NON-DIVIDING TISSUES* 064744 P 35
DNA AND MECHANISM OF RADIATION EFFECTS (T1252)* 064745 P 35
DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (064737 P 33
DNA BY TRITIUM DISINTEGRATIONS IN VIVO* 041901 P 13
DNA IN HIGHER PLANTS BY FEULGEN PHOTOMETRY AND CHEMICAL 064736 P 33
DNA IN TRITIATED KANGAROO RAT LIVING AT SEDAN CRATER* 040664 P 3
DNA IN TRITIATED KANGAROO RATS LIVING AT SEDAN CRATER* 066770 P 43
DNA IN VIVO* 044763 P 21
DNA LABEL IN MAN (T1858)* 064740 P 34
DNA LABEL IN RAT LIVER (T2297)* 064755 P 39
DNA LABEL IN RAT LIVER (T2297)* 064771 P 43
DNA OF LEAF CELLS* 041888 P 11
DNA OF MOUSE ORGANS (T0031)* 064738 P 34
DNA OF MOUSE TISSUES AND ON ITS RADIATION EFFECTS (T2297)* 064758 P 40
DNA UNDER CONDITIONS OF PROLONGED ADMINISTRATION (T7590)* 064762 P 41
DNA* 065659 P 47
DNA* # 064760 P 40
DNA. PROGRESS REPORT, JUNE 1, 1966 TO DECEMBER 31, 1966.* 053555 P 28
DOMESTIC ANIMALS (HPIS/133)* 077006 P 55
DOMESTIC COOKING* #TRITIUM 078468 P 56
DOSE COMMITMENT TO MARINE ORGANISMS* 075321 P 55
DOSE DUE TO ACUTE INTAKE OF TRITIUM BY MAN* 071505 P 53
DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 049713 P 25
DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM 049684 P 24
DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND 052834 P 28
DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM 070396 P 52
DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)* 064753 P 38
DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE TO 067165 P 51
DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL- 049600 P 23
DOSES OF H-3 -THYMIDINE OR X-RAYS* #THE FREQUENCY 043155 P 18
DOSES RESULTING FROM ADMINISTRATION OF TRITIATED FOLIC 062623 P 31
DOSES RESULTING FROM THE INGESTION OF TRITIATED THYMIDINE 049587 P 23
DOSES TO TISSUES AFTER ADMINISTRATION OF TRITIATED 049588 P 23
DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION 049714 P 25
DOSIMETRIC, RADIOLOGICAL AND RADIATION PROTECTION ASPECTS* 040776 P 7
DRINKING ON THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN 043182 P 18
DROSOPHILA AND THE HONEY BEE* #A QUANTITATIVE 040680 P 6
DROSOPHILA HYDEI* #STRUCTURAL AND FUNCTIONAL PROPERTIES 041893 P 12
DROSOPHILA MELANOGASTER LARVAE (PART II)* THYMIDINE 040783 P 8
DROSOPHILA MELANOGASTER*AND EVIDENCE FOR ITS INCORPORATION 040789 P 10
DROSOPHILA SPERMATOCYTES* 040780 P 8
DRUGS ON INTESTINAL CIRCULATION AND THE ABSORPTION OF 041886 P 11
DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER 064781 P 45
DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN 064781 P 45
DUE TO ACUTE INTAKE OF TRITIUM BY MAN* 071505 P 53
DUE TO BETA-RADIATION FROM INCORPD THYMIDINE LABELED WITH 064746 P 36

BREAKAGE AND 3H-THYMIDINE LABELING*#THE STAGE OF CHROMOSOME DUPLICATION IN THE CELL CYCLE AS REVEALED BY X-RAY 040667 P 4
* #DEUTERIUM FRACTIONATION DURING MOLECULAR HYDROGEN FORMATION IN A MARINE PSEUDOMONAD 043592 P 20
#GLYCOLIC ACID LABELING DURING PHOTOSYNTHESIS WITH C(14)O2 AND TRITIATED WATER* 042770 P 14
TURNOVER WITH TRITIUM AS TRACER. 5. PREDOMINANTLY NON- DYNAMIC STATE OF BODY CONSTITUENTS IN RAT (T7735)* 067124 P 50
AQUEOUS PHASE OF THE RABBIT ORGANISM AFTER PROLONGED # DYNAMICS OF THE ACCUMULATION OF HEAVY HYDROGEN IN THE 043365 P 19

#THE CHARACTERIZATION OF REVERTANTS OF TWO LOCI IN E. COLI WWU - A STUDY OF RADIATION ACTION ON THE GENE* 040682 P 7
ABERATIONS RESULTING FROM 3H-THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS* #CHROMATID 041900 P 13
#PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES* 065087 P 46
ECOLOGICAL ASPECTS OF TRITIUM BEHAVIOR IN THE ENVIRONMENT* 065101 P 46
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 17
DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 # ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE 082903 P 58
#MOVEMENT OF TRITIUM IN ECOLOGICAL SYSTEMS* 069508 P 52
A TRITIATED ENVIRONMENT* # ECOLOGY AND RADIATION EXPOSURE OF KANGAROO RATS LIVING IN 060607 P 30
#FRESHWATER ECOLOGY* 081340 P 56
#TRITIUM IN ECOLOGY. A REVIEW.* 053417 P 28
ESCHERICHIA COLI* #EVIDENCE FOR A MUTAGENIC LOCAL EFFECT ACCOMPANYING THE DECAY OF INCORPORATED TRITIUM IN 040779 P 8
#THE TRITIUM RATE EFFECT IN TYROSINASE-CATALYZED HYDROXYLATION.* 051589 P 27
UPTAKE BY RAT PITUITARY (T4647)* # EFFECT OF AGE, SEX, HORMONAL STATE ON TRITIATED THYMIDINE 064751 P 37
OF EXPOSURE TO TRITIUM OXIDE* # EFFECT OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD 064778 P 44
GUINEA-PIG AND RABBIT UNDER TROPICAL CONDITIONS AND THE EFFECT OF CLIMATE AND SALINE DRINKING ON THE BIOLOGICAL 043182 P 18
ABSORPTION OF TRITIUM OXIDE* # EFFECT OF SEASON AND TEMPERATURE ON PERCUTANEOUS 049607 P 24
INTO TISSUES OF YOUNG AND OLD MICE (T2675)* # EFFECT OF SPECIFIC ACTIVITY OF H3-CYTIDINE ON ITS INCORP 064752 P 38
#A QUANTITATIVE STUDY OF THE MUTAGENIC EFFECT OF TRANSMUTATION IN DROSOPHILA AND THE HONEY BEE* 040680 P 6
MORTALITY OF THE ADULT DROSOPHILA MELANOGASTER LARVAE (#THE EFFECT OF TRITIATED THYMIDINE AND GAMMA IRRADIATION ON THE 040783 P 8
T2297)* # EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (064741 P 35
IN A RING CHROMOSOME* # EFFECT OF TRITIATED THYMIDINE ON SISTER-CHROMATID EXCHANGE 040681 P 6
#THE MUTAGENIC EFFECT OF TRITIATED URIDINE IN DROSOPHILA SPERMATOCYTES* 040780 P 8
EFFECT OF TRITIUM OXIDE ON THE FERTILITY OF MALES* 042766 P 14
#ANESTHETIC GASES AND WATER STRUCTURE. THE EFFECT OF XENON ON TRITIATED WATER FLUX ACROSS THE GUT* 042765 P 14
#TRANSMUTATION EFFECT* 040787 P 9
OF TRITIUM IN EMBRYO AND LARVAL FISH AND RADIATION EFFECT* #ACCUMULATION AND RETENTION 065955 P 48
AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC 054897 P 28
BEAN ROOT (VICIA FABA) AS A TEST #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD 051314 P 26
* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN RATS. 054914 P 28
#THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM ON PREIMPLANTATION MOUSE EMBRYOS* 082373 P 57
THYMIDINE INCORP INTO MOUSE DNA AND MECHANISM OF RADIATION EFFECTS (T1252)* #FOUR-FACTOR MODEL ANALYSIS OF 064745 P 35
THYMIDINE IN DNA OF MOUSE TISSUES AND ON ITS RADIATION EFFECTS (T2297)* #STUDIES ON INCORP OF TRITIATED 064758 P 40
#TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY* 075246 P 54
#RADIATION EFFECTS OF CARBON-14 AND TRITIUM ON GROWTH OF SOYBEANS.* 054625 P 28
POECILIA RETICULATE, THE GUPPY* #THE EFFECTS OF CHRONIC IRRADIATION BY TRITIATED WATER ON 026846 P 2
#ON THE DIFFERENCE BETWEEN THE LETHAL EFFECTS OF H3 AND P32 IN BACTERIA* 041889 P 11
* # EFFECTS OF H3-THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297) 064771 P 43
GAS.* #BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF TRITIUM 051402 P 26
EFFECTS OF INTRACELLULAR IRRADIATION WITH TRITIUM.* 053130 P 28
LARVAE OF THE PACIFIC OYSTER, CRASSOSTREA GIGAS* # EFFECTS OF IONIZING RADIATION AND TEMPERATURE ON THE 066269 P 48
FIXATION AND LONG-TERM ACCUMULATION OF TRITIUM IN AN # EFFECTS OF IRRADIATION ON EMBRYOGENESIS OF FISH AND 065088 P 46
CONGRESS OF THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E 044471 P 21
PACIFIC OYSTER*#COLUMBIA RIVER STUDIES 1969-1970, APPENDIX, EFFECTS OF TEMPERATURE AND RADIATION UPON LARVAE OF A 018273 P 1
INCORPORATION INTO A CYTOPLASMIC COMPONENT OF THE #GENETIC EFFECTS OF TRITIATED THYMIDINE AND EVIDENCE FOR ITS 040789 P 10
(T2297)* #SOME EFFECTS OF TRITIATED THYMIDINE AS A DNA LABEL IN RAT LIVER 064755 P 39
ALLIUM CEPA L* #CYTOLOGICAL EFFECTS OF TRITIATED WATER (THO) ON ROOT-TIP MERISTEMS OF 043274 P 18
#SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL DEVELOPMENT* 049533 P 23
THE THREE-SPINE STICKLEBACK* # EFFECTS OF TRITIATED WATER ON THE EMBRYONIC DEVELOPMENT OF 069507 P 52
1966 TO DECEMBER 31, 1966.* #THE EFFECTS OF TRITIUM DECAY ON DNA. PROGRESS REPORT, JUNE 1, 053555 P 28
EFFECTS OF TRITIUM DECAY ON DNA* 065659 P 47
REPORT, JUNE 1, 1962 - JULY 31, 1964* #THE EFFECTS OF TRITIUM OXIDE ON AQUATIC ORGANISMS. FINAL 043180 P 18
#THE EFFECTS OF TRITIUM OXIDE ON AQUATIC ORGANISMS* 043088 P 15
THE PACIFIC OYSTER, ESTIMATION OF BIOLOGICAL HALF-LIFE FOR # EFFECTS OF TRITIUM Y-90, AND SR-90 + Y-90 ON THE LARVAE OF 048349 P 22
SYNCHRONIZED L-CELLS* #TRITIATED THYMIDINE EFFECTS ON DAN, RNA, AND PROTEIN SYNTHETIC RATES IN 040671 P 5
IN UTERO WITH TRITIATED WATER* #SOME EFFECTS ON MAMMALIAN DEVELOPMENT OF CONTINUOUS IRRADIATION 065122 P 47
#RADIATION EFFECTS POLY-DAT FROM INTRAMOLECULAR TRITIUM* 041895 P 13
#RADIATION EFFECTS UPON WATER ABSORPTION AND EXCRETION IN THE RAT* 040665 P 4
#HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF 021312 P 2
#CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 20
91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 044471 P 21
FOLLOWING BURNS* #TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN PATIENTS 043246 P 18
SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS* #LIQUID SCINTILLATION 040792 P 10
#ACCUMULATION AND RETENTION OF TRITIUM IN EMBRYO AND LARVAL FISH AND RADIATION EFFECT* 065955 P 48
ACCUMULATION OF TRITIUM IN AN #EFFECTS OF IRRADIATION ON EMBRYOGENESIS OF FISH AND FIXATION AND LONG-TERM 065088 P 46
#EFFECTS OF TRITIATED WATER ON THE EMBRYONIC DEVELOPMENT OF THE THREE-SPINE STICKLEBACK* 069507 P 52
EFFECTIVENESS OF TRITRIUM ON PREIMPLANTATION MOUSE EMBRYOS* #THE RELATIVE BIOLOGICAL 082373 P 57
#THE QUALITY FACTOR FOR LOW-ENERGY BETA- EMITTERS* 049712 P 25
DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER ET INCORP 064781 P 45
#THE QUALITY FACTOR FOR LOW- ENERGY BETA-EMITTERS* 049712 P 25
LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR 066272 P 48
#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 49
#TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY* 075246 P 54
#LEVELS OF RADIOACTIVITY IN THE MARINE ENVIRONMENT AND THE DOSE COMMITMENT TO MARINE ORGANISMS* 075321 P 55
#RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE EUREX NUCLEAR PLANT* 075309 P 54
#TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO ANIMALS AND MAN* 068619 P 51
#ECOLOGICAL ASPECTS OF TRITIUM BEHAVIOR IN THE ENVIRONMENT* 065101 P 46
#THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 3
RADIATION EXPOSURE OF KANGAROO RATS LIVING IN A TRITIATED ENVIRONMENT* #ECOLOGY AND 060607 P 30
TERM ACCUMULATION OF TRITIUM IN AN EXPERIMENTAL AQUATIC ENVIRONMENT*ON EMBRYOGENESIS OF FISH AND FIXATION AND LONG- 065088 P 46

HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS* #
#THE APPLICABILITY OF THE HONEYBEE AS AN INDICATOR OF
THE ALTERNATION OF SYNTHESIS OF IDENTICAL CHROMOSOMES IN
EFFECT ACCOMPANYING THE DECAY OF INCORPORATED TRITIUM IN
MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF #
(MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF
THYMIDINE* #PRELIMINARY
(MPC)*W* FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF
#NEW DOSE
Y-90, AND SR-90 + Y-90 ON THE LARVAE OF THE PACIFIC OYSTER,
RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES #
ADMINISTRATION OF TRITIATED CORTICOSTEROIDS TO THE RAT* #
THE RAT, CAT, RABBIT, GUINEA PIG, AND MAN, AND OF THE #
SUBJECTED TO RAPID LIVE-WEIGHT CHANGES* #
#TOTAL BODY WATER
ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE
DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER
#RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE
#LONG-TERM
* #QUANTITATIVE
OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO
CHROMOSOMES IN ESCHERICHIA COLI GROWING AT LOW RATES* #
DECAY OF INCORPORATED TRITIUM IN ESCHERICHIA COLI* #
COMPONENT OF #GENETIC EFFECTS OF TRITIATED THYMIDINE AND
ISOTOPES* #WATER
#EFFECT OF TRITIATED THYMIDINE ON SISTER-CHROMATID
#TRITIUM
#RADIAL
#RADIAL
#RADIATION DOSE FROM NON-
THYMIDINE OR X-RAYS* #THE FREQUENCY OF SISTER CHROMATID
#RADIATION EFFECTS UPON WATER ABSORPTION AND
CERAMIDE) RADIOACTIVITY BY MONKEYS* #DISTRIBUTION AND
AND FIXATION AND LONG-TERM ACCUMULATION OF TRITIUM IN AN
#TRITIATION OF AQUATIC ANIMALS IN AN
#TRITIATION OF AQUATIC ANIMALS IN AN
#REVIEW OF LABORATORY ANIMAL
#COMPARISON OF HTO IN PLASMA AND
* #ECOLOGY AND RADIATION
#DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM
OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF
#THE FREQUENCY OF SISTER CHROMATID EXCHANGES FOLLOWING
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM

ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - 044471 P 21
ENVIRONMENTAL RADIOCONTAMINATION* 082345 P 57
ESCHERICHIA COLI GROWING AT LOW RATES* #EVIDENCE AGAINST 040666 P 4
ESCHERICHIA COLI* #EVIDENCE FOR A MUTAGENIC LOCAL 040779 P 8
EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (064773 P 44
ESTD AND MEASURED VALUES FOR ZN-65 AND TRITIUM (T1643)* 064773 P 44
ESTIMATE OF THE HAZARD FROM INGESTION OF TRITIATED 058835 P 30
ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND TRITIUM.* 051573 P 26
ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 049713 P 25
ESTIMATION OF BIOLOGICAL HALF-LIFE FOR ZN IN OYSTER* 048349 P 22
ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF 051573 P 26
ESTIMATION OF RADIATION DOSES TO TISSUES AFTER 049588 P 23
ESTIMATION OF TOTAL BODY WATER (VIRTUAL TRITIUM SPACE) IN 049222 P 22
ESTIMATION OF WATER CONTENT BY TRITIUM DILUTION OF ANIMALS 042852 P 15
ESTIMATIONS IN DAIRY CATTLE USING TRITIATED WATER* 043358 P 19
ET DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER 064781 P 45
ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET 064781 P 45
EUREX NUCLEAR PLANT* 075309 P 54
EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM* 064779 P 45
EVALUATION OF TRITIUM IN AUTORADIOGRAPHY AND RADIOCHEMISTRY 043093 P 16
EVAPORATION AT THE SOIL SURFACE* #CONTRIBUTION 027023 P 2
EVIDENCE AGAINST THE ALTERNATION OF SYNTHESIS OF IDENTICAL 040666 P 4
EVIDENCE FOR A MUTAGENIC LOCAL EFFECT ACCOMPANYING THE 040779 P 8
EVIDENCE FOR ITS INCORPORATION INTO A CYTOPLASMIC 040789 P 10
EXCHANGE AND BARRIERS AS STUDIED BY THE USE OF HYDROGEN 044225 P 21
EXCHANGE IN A RING CHROMOSOME* 040681 P 6
EXCHANGE IN BIOLOGICAL SYSTEMS* 043103 P 16
EXCHANGE OF LABELED WATER IN INTACT MAIZE ROOTS* 043359 P 19
EXCHANGE OF LABELED WATER IN MAIZE ROOTS* 043092 P 15
EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE INGESTION* 049684 P 24
EXCHANGES FOLLOWING EXPOSURE TO VARYING DOSES OF H-3 - 043155 P 18
EXCRETION IN THE RAT* 040665 P 4
EXCRETION OF TRITIUM LABELED CEREBROSIDES (GALACTOSYL 056181 P 29
EXPERIMENTAL AQUATIC ENVIRONMENT* ON EMBRYOGENESIS OF FISH 065088 P 46
EXPERIMENTAL FRESHWATER POOL* 045046 P 21
EXPERIMENTAL MARINE POOL* 069935 P 52
EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF TRITIUM (T7609)* 064777 P 44
EXPIRED WATER VAPOR* 064783 P 45
EXPOSURE OF KANGAROO RATS LIVING IN A TRITIATED ENVIRONMENT 060607 P 30
EXPOSURE TO TRITIATED WATER VAPOR* 070396 P 52
EXPOSURE TO TRITIUM OXIDE* #EFFECT 064778 P 44
EXPOSURE TO VARYING DOSES OF H-3 -THYMIDINE OR X-RAYS* 043155 P 18
EXPOSURES* 049713 P 25

OF TRITATED THYMIDINE IN THE ROOT TIP MERISTEM OF VICIA
OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA
IN THE UNITED STATES, INCLUDING AREAS NEAR NUCLEAR
#THE QUALITY
AND MECHANISM OF RADIATION EFFECTS (T1252)* #FOUR-
#THYMIDINE METABOLISM - THE FOUR-
#RADIOACTIVE
#THE INFLUENCE OF DIETARY
POSTCOITUM* #THE
#METABOLISM AND
TRITIATED WATER (T7599)* #
#EFFECT OF TRITIUM OXIDE ON THE
#SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN
RATS IN THE #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO
RATS IN PERIODS #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO
AND THE MITOTIC INDEX IN CELL TYPES OF ADULT MICE, RAT
#MEASUREMENTS OF DNA IN HIGHER PLANTS BY
INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL
#THE EFFECTS OF TRITIUM OXIDE ON AQUATIC ORGANISMS.
AN EXPERIMENTAL #EFFECTS OF IRRADIATION ON EMBRYOGENESIS OF
#ACCUMULATION AND RETENTION OF TRITIUM IN EMBRYO AND LARVAL
#TRITIUM BEHAVIOR IN
#EFFECTS OF IRRADIATION ON EMBRYOGENESIS OF FISH AND
TYPES OF ADULT #AUTORADIOGRAPHIC INVESTIGATION OF DIURNAL
AND WATER STRUCTURE. THE EFFECT OF XENON ON TRITIATED WATER
#RADIATION DOSES RESULTING FROM ADMINISTRATION OF TRITIATED
#TRITIUM UPTAKE
AND ELECTROLYTES ACROSS GRANULATION TISSUE IN PATIENTS
RAYS* #THE FREQUENCY OF SISTER CHROMATID EXCHANGES
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE
INCORPORATION IN ALGAE AND TRANSFER IN SIMPLE AQUATIC
* #TRITIUM TRANSFER TO
WATER VAPOR* #DOSE TO MAN VIA
CONSIDERATION #HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN
#TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN
STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN
#DEUTERIUM FRACTIONATION DURING MOLECULAR HYDROGEN
DNA AND MECHANISM OF RADIATION EFFECTS (T1252)* #
* #THYMIDINE METABOLISM - THE
MARINE PSEUDOMONAD* #DEUTERIUM

FABA (L)* #UPTAKE 040791 P 10
FABA) AS A TEST SYSTEM.* RELATIVE BIOLOGICAL EFFECTIVENESS 051314 P 26
FACILITIES* #TRITIUM IN PINE TREES FROM SELECTED LOCATIONS 073994 P 53
FACTOR FOR LOW-ENERGY BETA-EMITTERS* 049712 P 25
FACTOR MODEL ANALYSIS OF THYMIDINE INCORP INTO MOUSE DNA 064745 P 35
FACTOR MODEL, POOL SIZES AND GROWTH INHIBITION (T7597)* 064765 P 42
FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 31
FAT ON THE INCORPORATION OF T2O IN AVIAN TISSUES* 043101 P 16
FATE OF ISOTOPE-LABELLED UTERINE SPERMATOZOA IN THE MOUSE 041894 P 13
FATE OF TRITIATED THYMIDINE IN MAN (T7585)* 064747 P 36
FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN 064769 P 43
FERTILITY OF MALES* 042766 P 14
FETAL DEVELOPMENT* 049533 P 23
FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF 043364 P 19
FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF 049639 P 24
FETUSES, ASCITES TUMOR CELLS* FLUCTUATIONS IN THE 3H-INDEX 040668 P 4
FEULGEN PHOTOMETRY AND CHEMICAL METHODS (T1858)* 064736 P 33
FIBROBLASTS* ABERATIONS RESULTING FROM 3H-THYMIDINE 041900 P 13
FIELD STUDIES* 043154 P 17
FINAL REPORT, JUNE 1, 1962 - JULY 31, 1964* 043180 P 18
FISH AND FIXATION AND LONG-TERM ACCUMULATION OF TRITIUM IN 065088 P 46
FISH AND RADIATION EFFECT* 065955 P 48
FISH FROM A CHRONICALLY CONTAMINATED LAKE* 012939 P 1
FIXATION AND LONG-TERM ACCUMULATION OF TRITIUM IN AN 065088 P 46
FLUCTUATIONS IN THE 3H-INDEX AND THE MITOTIC INDEX IN CELL 040668 P 4
FLUX ACROSS THE GUT* #ANESTHETIC GASES 042765 P 14
FOLIC ACID AND TRITIATED WATER IN THE RAT* 062623 P 31
FOLLOWING A THERMONUCLEAR TEST* 045087 P 22
FOLLOWING BURNS* #TRANSFER OF WATER 043246 P 18
FOLLOWING EXPOSURE TO VARYING DOSES OF H-3 -THYMIDINE OR X- 043155 P 18
FOOD CHAIN* 074536 P 53
FOOD CHAINS* #TRITIUM 061100 P 30
FOOD ITEMS FROM TRITIATED METHANE USED FOR DOMESTIC COOKING 078468 P 56
FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED 070396 P 52
FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO 021312 P 2
FOREST* 028688 P 3
FOREST* #RADIOECOLOGICAL 056628 P 29
FORMATION IN A MARINE PSEUDOMONAD* 043592 P 20
FOUR-FACTOR MODEL ANALYSIS OF THYMIDINE INCORP INTO MOUSE 064745 P 35
FOUR-FACTOR MODEL, POOL SIZES AND GROWTH INHIBITION (T7597) 064765 P 42
FRACTIONATION DURING MOLECULAR HYDROGEN FORMATION IN A 043592 P 20

TO VARYING DOSES OF H-3 -THYMIDINE OR X-RAYS* #THE FREQUENCY OF SISTER CHROMATID EXCHANGES FOLLOWING EXPOSURE 043155 P 18
#TRITIUM - DISCRIMINATION AND CONCENTRATION IN FRESH WATER MICROCOSMS* 067798 P 51
FRESHWATER ECOLOGY* 081340 P 56
#TRITIATION OF AQUATIC ANIMALS IN AN EXPERIMENTAL FRESHWATER POOL* 045046 P 21
TO DEUTERATED AND #A STUDY OF THE MECHANISM OF WATER ACROSS FROG SKIN BY A COMPARISON OF THE PERMEABILITY OF THE SKIN 041892 P 12
SALIVARY GLANDS OF DROSOPHILA HYDEI* #STRUCTURAL AND FUNCTIONAL PROPERTIES OF POLYTENE NUCLEI ISOLATED FROM 041893 P 12

DISTRIBUTION AND EXCRETION OF TRITIUM LABELED CEREBROSIDES (GALACTOSYL CERAMIDE) RADIOACTIVITY BY MONKEYS* # 056181 P 29
MELANOGASTER LARVAE (#THE EFFECT OF TRITIATED THYMIDINE AND GAMMA IRRADIATION ON THE MORTALITY OF THE ADULT DROSOPHILA 040783 P 8
OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (T7605)* 064772 P 43
LYMPH AND PLASMA TRANSPORT, AND TISSUE UPTAKE OF ALPHA- AND GAMMA-TOCOPHEROLS IN RAT (T2788)*OF INTESTINAL ABSORPTION, 067133 P 50
#CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 20
#ABSORPTION AND METABOLISM OF TRITIUM OXIDE AND TRITIUM GAS BY BEAN PLANTS.* 051228 P 26
EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS.* #BIOLOGICAL 051402 P 26
TRITIATED WATER FLUX ACROSS THE GUT* #ANESTHETIC GASES AND WATER STRUCTURE. THE EFFECT OF XENON ON 042765 P 14
#TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* 065163 P 47
#BODY WATER TURNOVER IN CATTLE WITH PARASITIC GASTROENTERITIS* 041887 P 11
VITRO AUTORADIOGRAPHIC STUDIES OF CELL PROLIFERATION IN THE GASTROINTESTINAL TRACT OF MAN* #IN 040670 P 5
LOCI IN E. COLI WWU - A STUDY OF RADIATION ACTION ON THE GENE* #THE CHARACTERIZATION OF REVERTANTS OF TWO 040682 P 7
ITS INCORPORATION INTO A CYTOPLASMIC COMPONENT OF THE # GENETIC EFFECTS OF TRITIATED THYMIDINE AND EVIDENCE FOR 040789 P 10
ON THE LARVAE OF THE PACIFIC OYSTER, CRASSOSTREA GIGAS* #EFFECTS OF IONIZING RADIATION AND TEMPERATURE 066269 P 48
PROPERTIES OF POLYTENE NUCLEI ISOLATED FROM SALIVARY GLANDS OF DROSOPHILA HYDEI* #STRUCTURAL AND FUNCTIONAL 041893 P 12
#3H-2- GLUCOSE AS TRACER IN TURNOVER STUDIES (T7591)* 064763 P 41
#COMPARISON OF H3- AND C14- GLUCOSE METABOLISM IN THE INTACT RAT* 067023 P 48
AND TRITIATED WATER* # GLYCOLIC ACID LABELING DURING PHOTOSYNTHESIS WITH C(14)O2 042770 P 14
#TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS* 043246 P 18
MOUSE.* #THE GROSS RETENTION AND METABOLISM OF TRITIUM OXIDE IN THE 051748 P 27
#STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. I. GROSS STUDIES ON THE MOUSE* 049604 P 24
#STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. GROSS STUDIES ON THE MOUSE* 043591 P 20
THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING GROUND* #PRELIMINARY STUDIES OF 040781 P 8
OF SYNTHESIS OF IDENTICAL CHROMOSOMES IN ESCHERICHIA COLI GROWING AT LOW RATES* #EVIDENCE AGAINST THE ALTERNATION 040666 P 4
METABOLISM - THE FOUR-FACTOR MODEL, POCL SIZES AND GROWTH INHIBITION (T7597)* #THYMIDINE 064765 P 42
#ACTION OF TRITIATED THYMIDINE ON THE CLONAL GROWTH OF MAMMALIAN CELLS.* 052180 P 27
#RADIATION EFFECTS OF CARBON-14 AND TRITIUM ON GROWTH OF SOYBEANS.* 054625 P 28
THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE 064759 P 40
#PHYSICS OF CELLULAR SYNTHESIS, GROWTH, AND DIVISION* 040679 P 6
BODY WATER (VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, RABBIT, GUINEA PIG, AND MAN, AND OF THE BIOLOGICAL HALF-LIFE OF 049222 P 22
BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE MOUSE, RAT, GUINEA-PIG AND RABBIT UNDER TROPICAL CONDITIONS AND THE 043182 P 18
IRRADIATION BY TRITIATED WATER ON POECILIA RETICULATE, THE GUPPY* #THE EFFECTS OF CHRONIC 026846 P 2
THE EFFECT OF XENON ON TRITIATED WATER FLUX ACROSS THE GUT* #ANESTHETIC GASES AND WATER STRUCTURE. 042765 P 14

CHROMATID EXCHANGES FOLLOWING EXPOSURE TO VARYING DOSES OF H-3 -THYMIDINE OR X-RAYS* #THE FREQUENCY OF SISTER 043155 P 18
DUE TO BETA-RADIATION FROM INCORPD THYMIDINE LABELED WITH H-3 OR C-14 (T2333)*#REPRODUCTIVE DEATH OF MAMMALIAN CELLS 064746 P 36
PROTECTION ASPECTS* #INTRANUCLEAR H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION 049714 P 25
#INCORPORATION OF TRITIUM IN HAIR* 062253 P 31
ITS INCORP INTO DNA (T1858A)* #DELAY AFTER PLUCKING OF HAIRS BETWEEN THE APPEARANCE OF H3-THYMIDINE IN CELLS AND 064750 P 37
THE LARVAE OF THE PACIFIC OYSTER, ESTIMATION OF BIOLOGICAL HALF-LIFE FOR ZN IN OYSTER* Y-90, AND SR-90 + Y-90 ON 048349 P 22
TRITIATED WATER IN RATS #COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF 047898 P 22
AND RABBIT UNDER TROPICAL CONDITIONS AND #THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE MOUSE, RAT, GUINEA-PIG 043182 P 18
THE EFFECT OF CLIMATE AND SALINE DRINKING ON THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE RAT* CONDITIONS AND 043182 P 18
CAT, RABBIT, GUINEA PIG, AND MAN, AND OF THE BIOLOGICAL HALF-LIFE OF TRITIUM IN MAN* TRITIUM SPACE) IN THE RAT, 049222 P 22
#LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM* 064779 P 45
WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL #TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED 049600 P 23
#THE KINETICS OF CHROMATID ABERRATIONS INDUCED IN CHINESE HAMSTER CELLS BY TRITIUM-LABELED THYMIDINE* 040790 P 10
#PRELIMINARY ESTIMATE OF THE HAZARD FROM INGESTION OF TRITIATED THYMIDINE* 058835 P 30
#THE HAZARD FROM TRITIUM CONTAMINATION* 057579 P 30
#EFFECT OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO TRITIUM OXIDE* 064778 P 44
HAZARD OF TRITIUM AS A DNA LABEL IN MAN (T1858)* 064740 P 34
HAZARDS FROM ISOTOPIC TRACERS (T2297)* 064749 P 37
WATER* # HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED 061721 P 31
LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31* 066272 P 48
#ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS* 064471 P 21
AFTER PROLONGED #DYNAMICS OF THE ACCUMULATION OF HEAVY HYDROGEN IN THE AQUEOUS PHASE OF THE RABBIT ORGANISM 043365 P 19
#MOVEMENT OF TRITIATED WATER IN THE ROOT SYSTEM OF HELIANTHUS ANNUUS IN THE PRESENCE AND ABSENCE OF 043304 P 19
#TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES* 064781 P 45
#BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS.* 051402 P 26
RADIORESISTANCE USING #CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND 052834 P 28
T1858)* #MEASUREMENTS OF DNA IN HIGHER PLANTS BY FEULGEN PHOTOMETRY AND CHEMICAL METHODS (064736 P 33
#BETA HISTORADIOGRAPHY WITH TRITIUM.* 051965 P 27
THE MUTAGENIC EFFECT OF TRANSMUTATION IN DROSOPHILA AND THE HONEY BEE* #A QUANTITATIVE STUDY OF 040680 P 6
RADIOCONTAMINATION* #THE APPLICABILITY OF THE HONEYBEE AS AN INDICATOR OF ENVIRONMENTAL 082345 P 57
PITUITARY (T4647)* #EFFECT OF AGE, SEX, HORMONAL STATE ON TRITIATED THYMIDINE UPTAKE BY RAT 064751 P 37
#ISOTOPE STUDIES ON THE PHYSIOLOGY OF DOMESTIC ANIMALS (HPIS/133)* 077006 P 55
#COMPARISON OF HTO IN PLASMA AND EXPIRED WATER VAPOR* 064783 P 45
#RADIOAUTOGRAPHY OF TRITIATED PHOTOSYNTHATE ARISING FROM HTO.* 051225 P 26
3H-THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS* #CHROMATID ABERATIONS RESULTING FROM 041900 P 13
#TRITIATED THYMIDINE AS A CYTOCIDAL AGENT IN HUMAN LEUKEMIA* 040675 P 6
#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 33
#UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.* 051967 P 27
POLYTENE NUCLEI ISOLATED FROM SALIVARY GLANDS OF DROSOPHILA HYDEI* #STRUCTURAL AND FUNCTIONAL PROPERTIES OF 041893 P 12
VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM # HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL 021312 P 2
#DEUTERIUM FRACTIONATION DURING MOLECULAR HYDROGEN FORMATION IN A MARINE PSEUDOMONAD* 043592 P 20

PROLONGED #DYNAMICS OF THE ACCUMULATION OF HEAVY
#WATER EXCHANGE AND BARRIERS AS STUDIED BY THE USE OF
#THE TRITIUM RATE EFFECT IN TYROSINASE-CATALYZED
FROM THE INTESTINE OF THE RAT* #THE INFLUENCE OF 5-
#ON THE DIFFERENCE BETWEEN THE LETHAL EFFECTS OF
#THYMIDINE METABOLISM AND
#COMPARISON OF
MICE (T2675)* #EFFECT OF SPECIFIC ACTIVITY OF
#EFFECTS OF
#DELAY AFTER PLUCKING OF HAIRS BETWEEN THE APPEARANCE OF

IN WATER (MPC)W FROM INTERSPECIES CORRELATIONS.
IN WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS.
#STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER.
THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER.
RATES* #EVIDENCE AGAINST THE ALTERNATION OF SYNTHESIS OF
FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE
THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER.
MORTALITY OF THE ADULT DROSOPHILA MELANOGASTER LARVAE (PART
#STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER.
#8 PAGES,
#HEALTH
DISINTEGRATIONS IN VIVO* #
IN PINE TREES FROM SELECTED LOCATIONS IN THE UNITED STATES,
LAIT, EN CONDITIONS NATURELLES* #TRANSFER ET
BETWEEN THE APPEARANCE OF H3-THYMIDINE IN CELLS AND ITS
T12521* #FOUR-FACTOR MODEL ANALYSIS OF THYMIDINE
#EFFECT OF SPECIFIC ACTIVITY OF H3-CYTIDINE ON ITS
ON ITS RADIATION EFFECTS (T2297)* #STUDIES ON
DEATH OF MAMMALIAN CELLS DUE TO BETA-RADIATION FROM
#LETHALITY FROM 3H-NUCLEOSIDES
FOR A MUTAGENIC LOCAL EFFECT ACCOMPANYING THE DECAY OF
#THYMIDINE METABOLISM - PATHWAYS OF
CHAINS* #TRITIUM
GENETIC EFFECTS OF TRITIATED THYMIDINE AND EVIDENCE FOR ITS
#CHROMATID ABERATIONS RESULTING FROM 3H-THYMIDINE
LIVER LIPIDS (T7596)* #
* #
ACID BY ISOLATED NUCLEI.* #
ADMINISTRATION (T2243)* #
THE MOUSE (T2297)* #
THE MOUSE* #
CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* #
#
CONDITIONS* #TRANSFER AND
#THE INFLUENCE OF DIETARY FAT ON THE
#FATTY ACID SYNTHESIS IN ADIPOSE TISSUE
INVESTIGATION OF DIURINAL FLUCTUATIONS IN THE 3H-
OF DIURINAL FLUCTUATIONS IN THE 3H-INDEX AND THE MITOTIC
#THE APPLICABILITY OF THE HONEYBEE AS AN
THYMIDINE* #THE KINETICS OF CHROMATID ABERRATIONS
#MUTATIONS
THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN
#TUMOR
TRITIATED THYMIDINE* #
AVIAN TISSUES* #THE
ABSORPTION OF TRITIUM-LABELED WATER IN THE SMALL INTESTINE #
REPRODUCTIVE CAPACITY OF MICE (T2297)* #DELETERIOUS
TRITIATED WATER FROM THE INTESTINE OF THE RAT* #THE
#DIFFUSION OF TRITIATED WATER INTO ROOTS AS
#RADIATION DOSES RESULTING FROM THE
#PRELIMINARY ESTIMATE OF THE HAZARD FROM
#BIOLOGICAL EFFECTS OF
METABOLISM - THE FOUR-FACTOR MODEL, POOL SIZES AND GROWTH
AS INTERNAL SOURCE OF RADIATION IN STUDY OF LATERAL ROOT
TRITIUM OXIDE IN MICE AND RATS SUBJECTED TO INTRAPERITONEAL
USE OF TRITIATED WATER (THO) FOR CONTINUOUS REGISTRATION OF
#RADIAL EXCHANGE OF LABELED WATER IN
#COMPARISON OF H3- AND C14-GLUCOSE METABOLISM IN THE
#RADIATION DOSE DUE TO ACUTE
#
#PROGRESS REPORT ON USE OF TRITIATED THYMIDINE AS
PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM
CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM
TISSUE UPTAKE OF ALPHA- AND GAMMA- #COMPARISON OF
LABELED WATER IN THE SMALL INTESTINE #INFLUENCE OF DRUGS ON
AND THE ABSORPTION OF TRITIUM-LABELED WATER IN THE SMALL
ON THE ABSORPTION OF TRITIATED WATER FROM THE
OF TRITIATED THYMIDINE AND EVIDENCE FOR ITS INCORPORATION
#INCORPORATION OF TRITIUM FROM TRITIATED WATER
TRITIUM AND OF TRITIATED WATER* #TRITIUM SECRETION
#INCORPORATION OF TRITIATED THYMIDINE
THE APPEARANCE OF H3-THYMIDINE IN CELLS AND ITS INCORP
#INCORPORATION OF TRITIATED THYMIDINE
#INCORPORATION OF THYMIDINE

HYDROGEN IN THE AQUEOUS PHASE OF THE RABBIT ORGANISM AFTER 043365 P 19
HYDROGEN ISOTOPES* 044225 P 21
HYDROXYLATION.* 051589 P 27
HYDROXYTRYPTAMINE ON THE ABSORPTION OF TRITIATED WATER 043152 P 17
H3 AND P32 IN BACTERIA* 041889 P 11
H3 THYMIDINE SUICIDE IN MAMMALIAN CELLS* 041574 P 11
H3- AND C14-GLUCOSE METABOLISM IN THE INTACT RAT* 067023 P 48
H3-CYTIDINE ON ITS INCORP INTO TISSUES OF YOUNG AND OLD 064752 P 38
H3-THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* 064771 P 43
H3-THYMIDINE IN CELLS AND ITS INCORP INTO DNA (T1858A)* 064750 P 37

I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND 064773 P 44
I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 051573 P 26
I. GROSS STUDIES ON THE MOUSE* 049604 P 24
I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS 042769 P 14
IDENTICAL CHROMOSOMES IN ESCHERICHIA COLI GROWING AT LOW 040666 P 4
IGENSTION* #RADIATION DOSE 049684 P 24
II. CRITICAL STUDY OF TECHNIQUES FOR ANALYSIS AND 042767 P 14
III)* OF TRITIATED THYMIDINE AND GAMMA IRRADIATION ON THE 040783 P 8
III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.* 051582 P 27
IMMUNOLOGY, VOL. 16, PAGES 83-90 (JANUARY 1969)* 041891 P 12
IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER* 061721 P 31
INACTIVATION OF TRANSFORMING DNA BY TRITIUM 041901 P 13
INCLUDING AREAS NEAR NUCLEAR FACILITIES* #TRITIUM 073994 P 53
INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU 064781 P 45
INCORP INTO DNA (T1858A)* #DELAY AFTER PLUCKING OF HAIRS 064750 P 37
INCORP INTO MOUSE DNA AND MECHANISM OF RADIATION EFFECTS (064745 P 35
INCORP INTO TISSUES OF YOUNG AND OLD MICE (T2675)* 064752 P 38
INCORP OF TRITIATED THYMIDINE IN DNA OF MOUSE TISSUES AND 064758 P 40
INCORPD THYMIDINE LABELED WITH H-3 OR C-14 (T2333)* 064746 P 36
INCORPORATED IN MAMMALIAN CELLS* 041899 P 13
INCORPORATED TRITIUM IN ESCHERICHIA COLI* #EVIDENCE 040779 P 8
INCORPORATION AND DEGRADATION* 064764 P 42
INCORPORATION IN ALGAE AND TRANSFER IN SIMPLE AQUATIC FOOD 061100 P 30
INCORPORATION INTO A CYTOPLASMIC COMPONENT OF THE ADULT 040789 P 10
INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN 041900 P 13
INCORPORATION OF RADIOACTIVE LABEL FROM PYRIMIDINES INTO 064761 P 41
INCORPORATION OF THYMIDINE INTO DNA OF MOUSE ORGANS (T0031) 064738 P 34
INCORPORATION OF TRITIATED THYMIDINE INTO DEOXYRIBONUCLEIC 051975 P 27
INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL 064748 P 36
INCORPORATION OF TRITIUM FROM THYMIDINE INTO PROTEINS OF 064726 P 32
INCORPORATION OF TRITIUM FROM THYMIDINE INTO PROTEINS OF 040775 P 7
INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO 064766 P 42
INCORPORATION OF TRITIUM IN HAIR* 062253 P 31
INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL 065163 P 47
INCORPORATION OF T2O IN AVIAN TISSUES* 043101 P 16
INCUBATED IN TRITIATED WATER (T7599)* 064769 P 43
INDEX AND THE MITOTIC INDEX IN CELL TYPES OF ADULT MICE, 040668 P 4
INDEX IN CELL TYPES OF ADULT MICE, RAT FETUSES, ASCITES 040668 P 4
INDICATOR OF ENVIRONMENTAL RADIOCONTAMINATION* 082345 P 57
INDUCED IN CHINESE HAMSTER CELLS BY TRITIUM-LABELED 040790 P 10
INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.* 051968 P 27
INDUCING CHROMOSOMAL ABERRATIONS (T7605)* OF TRITIATED 064772 P 43
INDUCTION IN MICE BY RADIOACTIVE THYMIDINE (T3356)* 064735 P 33
INDUCTION OF LEUKEMIA IN THE C57 BL MOUSE BY MEANS OF 040778 P 7
INFLUENCE OF DIETARY FAT ON THE INCORPORATION OF T2O IN 043101 P 16
INFLUENCE OF DRUGS ON INTESTINAL CIRCULATION AND THE 041886 P 11
INFLUENCE OF ORALLY ADMINISTERED TRITIATED THYMIDINE ON 064757 P 39
INFLUENCE OF 5-HYDROXYTRYPTAMINE ON THE ABSORPTION OF 043152 P 17
INFLUENCED BY WATER STATUS OF TISSUE.* 051313 P 26
INGESTION OF TRITIATED THYMIDINE BY THE RAT* 049587 P 23
INGESTION OF TRITIATED THYMIDINE* 058835 P 30
INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS.* 051402 P 26
INHIBITION (T7597)* #THYMIDINE 064765 P 42
INITIATION, 1965-1966*REPORT ON USE OF TRITIATED THYMIDINE 040782 P 8
INJECTION* #TOXICITY OF 040678 P 6
INSECT TRANSPIRATION* # 043105 P 17
INTACT MAIZE ROOTS* 043359 P 19
INTACT RAT* 067023 P 48
INTAKE OF TRITIUM BY MAN* 071505 P 53
INTERNAL CONTAMINATION WITH TRITIUM* 060933 P 31
INTERNAL SOURCE OF RADIATION IN STUDY OF LATERAL ROOT 040782 P 8
INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND 064773 P 44
INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTIMATED AND 051573 P 26
INTESTINAL ABSORPTION, LYMPH AND PLASMA TRANSPORT, AND 067133 P 50
INTESTINAL CIRCULATION AND THE ABSORPTION OF TRITIUM- 041886 P 11
INTESTINE OF RATS* OF DRUGS ON INTESTINAL CIRCULATION 041886 P 11
INTESTINE OF THE RAT*#THE INFLUENCE OF 5-HYDROXYTRYPTAMINE 043152 P 17
INTO A CYTOPLASMIC COMPONENT OF THE ADULT TESTIS OF 040789 P 10
INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* 064766 P 42
INTO COW'S MILK AFTER ADMINISTRATION OF ORGANICALLY BOUND 075319 P 54
INTO DEOXYRIBONUCLEIC ACID BY ISOLATED NUCLEI.* 051975 P 27
INTO DNA (T1858A)* #DELAY AFTER PLUCKING OF HAIRS BETWEEN 064750 P 37
INTO DNA AFTER ORAL ADMINISTRATION (T2243)* 064748 P 36
INTO DNA OF MOUSE ORGANS (T0031)* 064738 P 34

ABERATIONS RESULTING FROM 3H-THYMICINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS* 041900 P 13
#TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* 065163 P 47
#INCORPORATION OF RADIOACTIVE LABEL FROM PYRIMIDINES INTO LIVER LIPIDS (T7596)* 064761 P 41
#FOUR-FACTOR MODEL ANALYSIS OF THYMIDINE INCORP INTO MOUSE DNA AND MECHANISM OF RADIATION EFFECTS (T1252)* 064745 P 35
#3H THYMIDINE CORPORATION INTO NUCLEAR DNA OF LEAF CELLS* 041888 P 11
#INCORPORATION OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE (T2297)* 064726 P 32
#INCORPORATION OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE* 040775 P 7
#DIFFUSION OF TRITIATED WATER INTO ROOTS AS INFLUENCED BY WATER STATUS OF TISSUE.* 051313 P 26
#EFFECT OF SPECIFIC ACTIVITY OF H3-CYTIDINE ON ITS INCORP INTO TISSUES OF YOUNG AND OLD MICE (T2675)* 064752 P 38
#EFFECTS OF INTRACELLULAR IRRADIATION WITH TRITIUM.* 053130 P 28
#RADIATION EFFECTS POLY-DAT FROM INTRAMOLECULAR TRITIUM* 041895 P 13
AND RADIATION PROTECTION ASPECTS* # INTRANUCLEAR H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL 049714 P 25
T2241)* # INTRANUCLEAR IRRADIATICN WITH TRITIUM-LABELED THYMIDINE (064739 P 34
#RADIOTOXICITY OF INTRANUCLEAR TRITIUM, 125-IODINE AND 131-IODINE* 072215 P 53
RADIATION PROTECTION ASPECTS* # INTRANUCLEAR 3H THYMIDINE - DOSIMETRIC, RADIOLOGICAL AND 040776 P 7
#TOXICITY OF TRITIUM OXIDE IN MICE AND RATS SUBJECTED TO INTRAPERITONEAL INJECTION* 040678 P 6
TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED 042769 P 14
THE MITOTIC INDEX IN CELL TYPES OF ADULT #AUTORADIOGRAPHIC INVESTIGATION OF DIURINAL FLUCTUATIONS IN THE 3H-INDEX AND 040668 P 4
AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE 082903 P 58
INVESTIGATION OF TRITIATED LUMINOUS COMPOUNDS* 065935 P 47
#RADIOTOXICITY OF INTRANUCLEAR TRITIUM, 125- IODINE AND 131-IODINE* 072215 P 53
#RADIOTOXICITY OF INTRANUCLEAR TRITIUM, 125-IODINE AND 131- IODINE* 072215 P 53
PACIFIC OYSTER, CRASSOSTREA GIGAS* #EFFECTS OF IONIZING RADIATION AND TEMPERATURE ON THE LARVAE OF THE 066269 P 48
RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN RATS.* #THE 054914 P 28
WITH #CELLULAR PROLIFERATION IN NORMAL AND CONTINUOUSLY IRRADIATED RAT BONE MARROW STUDIED BY REPEATED LABELLING 054728 P 28
GUPPY* #THE EFFECTS OF CHRONIC IRRADIATION BY TRITIATED WATER ON POECILIA RETICULATE, THE 026846 P 2
#LABELING OF PROTEINS BY IRRADIATION IN TRITIATED WATER (T2617B)* 067143 P 50
#SOME EFFECTS ON MAMMALIAN DEVELOPMENT OF CONTINUOUS IRRADIATION IN UTERO WITH TRITIATED WATER* 065122 P 47
JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE #CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF 052834 P 28
TERM ACCUMULATICN OF TRITIUM IN AN EXPERIMENTAL #EFFECTS OF IRRADIATION ON EMBRYOGENESIS OF FISH AND FIXATION AND LONG- 065088 P 46
MELANOGASTER #THE EFFECT OF TRITIATED THYMIDINE AND GAMMA IRRADIATION ON THE MORTALITY OF THE ADULT DROSOPHILA 040783 P 9
#EFFECTS OF INTRACELLULAR IRRADIATION WITH TRITIUM.* 053130 P 28
#INTRANUCLEAR IRRADIATION WITH TRITIUM-LABELED THYMIDINE (T2241)* 064739 P 34
#STRUCTURAL AND FUNCTIONAL PROPERTIES OF POLYTENE NUCLEI ISOLATED FROM SALIVARY GLANDS OF DROSOPHILA HYDEI* 041893 P 12
OF TRITIATED THYMIDINE INTO DEOXYRIBONUCLEIC ACID BY ISOLATED NUCLEI.* #INCORPORATION 051975 P 27
HPIS/133)* # ISOTOPE STUDIES ON THE PHYSIOLOGY OF DOMESTIC ANIMALS (077006 P 55
POSTCOITUM* #THE FATE OF ISOTOPE-LABELLED UTERINE SPERMATOZOA IN THE MOUSE 041894 P 13
#LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH* 016938 P 1
EXCHANGE AND BARRIERS AS STUDIED BY THE USE OF HYDROGEN ISOTOPES* #WATER 044225 P 21
#HAZARDS FROM ISOTOPIC TRACERS (T2297)* 064749 P 37
#TRITIUM TRANSFER TO FOOD ITEMS FROM TRITIATED METHANE USED FOR DOMESTIC COOKING* 078468 P 56
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 31
SURVEY* #TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE 075246 P 54
HAIRS BETWEEN THE APPEARANCE OF H3-THYMIDINE IN CELLS AND ITS INCORP INTO DNA (T1858A)* #DELAY AFTER PLUCKING OF 064750 P 37
#EFFECT OF SPECIFIC ACTIVITY OF H3-CYTIDINE ON ITS INCORP INTO TISSUES OF YOUNG AND OLD MICE (T2675)* 064752 P 38
#GENETIC EFFECTS OF TRITIATED THYMIDINE AND EVIDENCE FOR ITS INCORPORATION INTO A CYTOPLASMIC COMPONENT OF THE 040789 P 10
OF TRITIATED THYMIDINE IN DNA OF MOUSE TISSUES AND ON ITS RADIATION EFFECTS (T2297)* #STUDIES ON INCORP 064758 P 40
POTENTIALS IN NORMAL AND #TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND 064759 P 40
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 53

EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS*ENVIRONMENTAL 044471 P 21
BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31* CHALK RIVER NUCLEAR LABORATORIES, 066272 P 48
IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING 052834 P 28

#STUDIES ON LIVER DNA IN TRITIATED KANGAROO RAT LIVING AT SEDAN CRATER* 040664 P 3
#STUDIES ON LIVER DNA IN TRITIATED KANGAROO RATS LIVING AT SEDAN CRATER* 064770 P 43
#ECOLOGY AND RADIATION EXPOSURE OF KANGAROO RATS LIVING IN A TRITIATED ENVIRONMENT* 060607 P 30
CONNECTED WITH THE USE OF TRACERS.* #THE KINETICS OF BIOLOGICAL PROCESSES. SPECIAL PROBLEMS 052980 P 28
HAMSTER CELLS BY TRITIUM-LABELED THYMIDINE* #THE KINETICS OF CHROMATID ABERRATIONS INDUCED IN CHINESE 040790 P 10
KINETICS OF TRITIUM IN BIOLOGICAL SYSTEMS* 077200 P 55
#NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* 043102 P 16

TRITATED THYMIDINE IN THE ROOT TIP MERISTEM OF VICIA FABA (L)* #UPTAKE OF 040791 P 10
ON DAN, RNA, AND PROTEIN SYNTHETIC RATES IN SYNCHRONIZED L-CELLS* #TRITIATED THYMIDINE EFFECTS 040671 P 5
#INCORPORATION OF RADIOACTIVE LABEL FROM PYRIMIDINES INTO LIVER LIPIDS (T7596)* 064761 P 41
#HAZARD OF TRITIUM AS A DNA LABEL IN MAN (T1858)* 064740 P 34
#SOME EFFECTS OF TRITIATED THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* 064755 P 39
#EFFECTS OF H3-THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* 064771 P 43
LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM- LABELED AMINO ACIDS* #TOXICITY OF TRITIUM- 040785 P 9
BY MONKEYS* #DISTRIBUTION AND EXCRETION OF TRITIUM LABELED CEREBROSIDES (GALACTOSYL CERAMIDE) RADIOACTIVITY 056181 P 29
#RADIATION DECOMPOSITION OF TRITIUM- LABELED COMPOUNDS* 040784 P 9
LABELED AMINO ACIDS* #TOXICITY OF TRITIUM- LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM- 040785 P 9
#LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM- LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS* 040792 P 10
#INTRANUCLEAR IRRADIATION WITH TRITIUM- LABELED THYMIDINE (T2241)* 064739 P 34
OF GROWTH RATES AND POTENTIALS IN NORMAL AND #TRITIUM- LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY 064759 P 40
#USE OF TRITIUM- LABELED THYMIDINE IN STUDIES ON SYNTHESIS OF DNA* 064760 P 40
#TOXICITY OF TRITIUM- LABELED THYMIDINE* 040786 P 9
ABERRATIONS INDUCED IN CHINESE HAMSTER CELLS BY TRITIUM- LABELED THYMIDINE* #THE KINETICS OF CHROMATID 040790 P 10
#RADIAL EXCHANGE OF LABELED WATER IN INTACT MAIZE ROOTS* 043359 P 19

#RADIAL EXCHANGE OF LABELED WATER IN MAIZE ROOTS* 043092 P 15
- BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. I. INTRODUCTION 042769 P 14
ON INTESTINAL CIRCULATION AND THE ABSORPTION OF TRITIUM- LABELED WATER IN THE SMALL INTESTINE OF RATS* OF DRUGS 041886 P 11
#TOXICITY OF TRITIUM- LABELED WATER* 040788 P 9
CELLS DUE TO BETA-RADIATION FROM INCORPD THYMIDINE LABELED WITH H-3 OR C-14 (T2333)* DEATH OF MAMMALIAN 064746 P 36
PROCESSING SEQUENCE FOR COVERSLIP MONOLAYER TISSUE CULTURES LABELED WITH TRITIATED THYMYDINE* #RADIOAUTOGRAPHIC 041890 P 12
WATER* #GLYCOLIC ACID LABELING DURING PHOTOSYNTHESIS WITH C(14)O2 AND TRITIATED 042770 P 14
DIVIDING TISSUES* # LABELING OF DNA AND CELL DIVISION IN SO CALLED NON- 064744 P 35
T2617B)* # LABELING OF PROTEINS BY IRRADIATION IN TRITIATED WATER (067143 P 50
CELL CYCLE AS REVEALED BY X-RAY BREAKAGE AND 3H-THYMIDINE LABELING* #THE STAGE OF CHROMOSOME DUPLICATION IN THE 040667 P 4
#THE FATE OF ISOTOPE- LABELLED UTERINE SPERMATOZOA IN THE MOUSE POSTCOITUM* 041894 P 13
CONTINUOUSLY IRRADIATED RAT BONE MARROW STUDIED BY REPEATED LABELLING WITH TRITIATED THYMIDINE.* IN NORMAL AND 054728 P 28
#ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, 066272 P 48
OF TRITIUM (T7609)* #REVIEW OF LABORATORY ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY 064777 P 44
#PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES* 065087 P 46
RADIATION IN ANIMAL RESEARCH* # LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND 016938 P 1
ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER 064781 P 45
#TRITIUM BEHAVIOR IN FISH FROM A CHRONICALLY CONTAMINATED LAKE* 012939 P 1
ON THE MORTALITY OF THE ADULT DROSOPHILA MELANOGASTER LARVAE (PART II)*TRITIATED THYMIDINE AND GAMMA IRRADIATION 040783 P 8
1970, APPENDIX, EFFECTS OF TEMPERATURE AND RADIATION UPON LARVAE OF A PACIFIC OYSTER* #COLUMBIA RIVER STUDIES 1969- 018273 P 1
#EFFECTS OF IONIZING RADIATION AND TEMPERATURE ON THE LARVAE OF THE PACIFIC OYSTER, CRASSOSTREA GIGAS* 066269 P 48
HALF-LIFE #EFFECTS OF TRITIUM Y-90, AND SR-90 + Y-90 ON THE LARVAE OF THE PACIFIC OYSTER, ESTIMATION OF BIOLOGICAL 048349 P 22
#ACCUMULATION AND RETENTION OF TRITIUM IN EMBRYO AND LARVAL FISH AND RADIATION EFFECT* 065955 P 48
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 29
RESULTING FROM 3H-THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS* #CHROMATID ABERATIONS 041900 P 13
THYMIDINE AS INTERNAL SOURCE OF RADIATION IN STUDY OF LATERAL ROOT INITIATION, 1965-1966* ON USE OF TRITIATED 040782 P 8
#3H THYMIDINE CORPORATION INTO NUCLEAR DNA OF LEAF CELLS* 041888 P 11
AND MEASUREMENT OF RADIOACTIVITY OF WATER AND TRITIATED LEAF METABOLITES.* STUDY OF TECHNIQUES FOR ANALYSIS 042767 P 14
BIBLIOGRAPHIC #STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - 042769 P 14
TECHNIQUES FOR #STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. II. CRITICAL STUDY OF 042767 P 14
#ANNUAL SCIENTIFIC REPORT 1971, CENTRE D'ETUDE DE LENERGIE NUCLEAIRE, MOL (BELGIUM)* 081542 P 57
NATURELLES* #TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS 064781 P 45
#ON THE DIFFERENCE BETWEEN THE LETHAL EFFECTS OF H3 AND P32 IN BACTERIA* 041889 P 11
BACTERIOPHAGES* # LETHALITY AND MUTATIONS PRODUCED BY TRITIUM DECAY IN 040683 P 7
CELLS* # LETHALITY FROM 3H-NUCLEOSIDES INCORPORATED IN MAMMALIAN 041899 P 13
THYMIDINE* #INDUCTION OF LEUKEMIA IN THE C57 BL MOUSE BY MEANS OF TRITIATED 040778 P 7
#TRITIATED THYMIDINE AS A CYTOCIDAL AGENT IN HUMAN LEUKEMIA* 040675 P 6
DOSE COMMITMENT TO MARINE ORGANISMS* # LEVELS OF RADIOACTIVITY IN THE MARINE ENVIRONMENT AND THE 075321 P 55
#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 49
LARVAE OF THE PACIFIC OYSTER, ESTIMATION OF BIOLOGICAL HALF- LIFE FOR ZN IN OYSTER* Y-90, AND SR-90 + Y-90 ON THE 048349 P 22
TRITIATED WATER IN #COMPARISON BETWEEN THE BIOLOGICAL HALF- LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF 047898 P 22
RABBIT UNDER TROPICAL CONDITIONS AND #THE BIOLOGICAL HALF- LIFE OF TRITIATED WATER IN THE MOUSE, RAT, GUINEA-PIG AND 043182 P 18
OF CLIMATE AND SALINE DRINKING ON THE BIOLOGICAL HALF- LIFE OF TRITIATED WATER IN THE RAT* AND THE EFFECT 043182 P 18
RABBIT, GUINEA PIG, AND MAN, AND OF THE BIOLOGICAL HALF- LIFE OF TRITIUM IN MAN* TRITIUM SPACE) IN THE RAT, CAT, 049222 P 22
#LONG-TERM EVALUATION OF THE BIOLOGICAL HALF- LIFE OF TRITIUM* 064779 P 45
OFFSPRING OF RATS IN THE PERIODS OF PRENATAL AND POSTNATAL LIFE* TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE 043364 P 19
THE OFFSPRING OF RATS IN PERIODS OF PRENATAL AND POSTNATAL LIFE* MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF 049639 P 24
HEALTH PHYSICS DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND 066272 P 48
OF RADIOACTIVE LABEL FROM PYRIMIDINES INTO LIVER LIPIDS (T7596)* #INCORPORATION 064761 P 41
OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* #INCORPORATION 064766 P 42
PROTEINS SEPARATED BY DISC ELECTROPHORESIS* # LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED 040792 P 10
#TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY* 075246 P 54
CONTENT BY TRITIUM DILUTION OF ANIMALS SUBJECTED TO RAPID LIVE-WEIGHT CHANGES* #ESTIMATION OF WATER 042852 P 15
#EFFECTS OF H3-THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* 064771 P 43
#SOME EFFECTS OF TRITIATED THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* 064755 P 39
* #STUDIES ON LIVER DNA IN TRITIATED KANGAROO RAT LIVING AT SEDAN CRATER* 040664 P 3
#STUDIES ON LIVER DNA IN TRITIATED KANGAROO RATS LIVING AT SEDAN CRATER 064770 P 43
#INCORPORATION OF RADIOACTIVE LABEL FROM PYRIMIDINES INTO LIVER LIPIDS (T7596)* 064761 P 41
#CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (T1510)* 064743 P 35
TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL #TRITIUM UPTAKE HALF- LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH 049600 P 23
#STUDIES ON LIVER DNA IN TRITIATED KANGAROO RAT LIVING AT SEDAN CRATER* 040664 P 3
#STUDIES ON LIVER DNA IN TRITIATED KANGAROO RATS LIVING AT SEDAN CRATER* 064770 P 43
#ECOLOGY AND RADIATION EXPOSURE OF KANGAROO RATS LIVING IN A TRITIATED ENVIRONMENT* 060607 P 30
TRITIUM IN ESCHERICHIA COLI* #EVIDENCE FOR A MUTAGENIC LOCAL EFFECT ACCOMPANYING THE DECAY OF INCORPORATED 040779 P 8
NUCLEAR FACILITIES* #TRITIUM IN PINE TREES FROM SELECTED LOCATIONS IN THE UNITED STATES, INCLUDING AREAS NEAR 073994 P 53
GENE* #THE CHARACTERIZATION OF REVERTANTS OF TWO LOCI IN E. COLI WWU - A STUDY OF RADIATION ACTION ON THE 040682 P 7
OF IRRADIATION ON EMBRYOGENESIS OF FISH AND FIXATION AND LONG-TERM ACCUMULATION OF TRITIUM IN AN EXPERIMENTAL 065088 P 46
* # LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM 064779 P 45
OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31, 082903 P 58
OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS 054897 P 28
OF IDENTICAL CHROMOSOMES IN ESCHERICHIA COLI GROWING AT LOW RATES* #EVIDENCE AGAINST THE ALTERNATION OF SYNTHESIS 040666 P 4
#THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS* 049712 P 25
#COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND 047898 P 22
#PERCUTANEOUS ABSORPTION BY RATS OF TRITIUM FROM A LUMINOUS COMPOUND* 047885 P 22
#INVESTIGATION OF TRITIATED LUMINOUS COMPOUNDS* 065935 P 47
#BIOLOGICAL STUDY OF A TRITIATED LUMINOUS PAINT* 043104 P 16
AND GAMMA-TOCOPHEROLS #COMPARISON OF INTESTINAL ABSORPTION, LYMPH AND PLASMA TRANSPORT, AND TISSUE UPTAKE OF ALPHA- 067133 P 50

#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (T0226)* 064727 P 32
#RADIAL EXCHANGE OF LABELED WATER IN MAIZE ROOTS* 043092 P 15
#RADIAL EXCHANGE OF LABELED WATER IN INTACT MAIZE ROOTS* 043359 P 19
#EFFECT OF TRITIUM OXIDE ON THE FERTILITY OF MALES* 042766 P 14
USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (T2297)* TOXICITY AND 064759 P 40
THYMIDINE LABELED WITH H-3 OR C-14 (#REPRODUCTIVE DEATH OF MAMMALIAN CELLS DUE TO BETA-RADIATION FROM INCORPD 064746 P 36
#ACTION OF TRITIATED THYMIDINE ON THE CLONAL GROWTH OF MAMMALIAN CELLS.* 052180 P 27

#THYMIDINE METABOLISM AND H3 THYMIDINE SUICIDE IN MAMMALIAN CELLS* 041574 P 11
#LETHALITY FROM 3H-NUCLEOSIDES INCORPORATED IN MAMMALIAN CELLS* 041899 P 13
WITH TRITIATED WATER* #SOME EFFECTS ON MAMMALIAN DEVELOPMENT OF CONTINUOUS IRRADIATION IN UTERO 065122 P 47
#SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL DEVELOPMENT* 049533 P 23
#COMPARATIVE METABOLISM OF TRITIATED WATER BY MAMMALS* 043593 P 20
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (T0226)* 064728 P 32
#HAZARD OF TRITIUM AS A DNA LABEL IN MAN (T1858)* 064740 P 34
#METABOLISM AND FATE OF TRITIATED THYMIDINE IN MAN (T7585)* 064747 P 36
RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (T2297)* AND USE IN STUDY OF GROWTH 064759 P 40
#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 49
TRITIATED WATER VAPOR* #DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO 070396 P 52
#RADIATION DOSE DUE TO ACUTE INTAKE OF TRITIUM BY MAN* 071505 P 53
MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO ANIMALS AND MAN* #TRANSFER OF RADIOACTIVE 068619 P 51
OF CELL PROLIFERATION IN THE GASTROINTESTINAL TRACT OF MAN* #IN VITRO AUTORADIOGRAPHIC STUDIES 040670 P 5
PIG, AND MAN, AND OF THE BIOLOGICAL HALF-LIFE OF TRITIUM IN MAN*VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, RABBIT, GUINEA 049222 P 22
TRITIUM SPACE) IN THE RAT, CAT, RABBIT, GUINEA PIG, AND MAN, AND OF THE BIOLOGICAL HALF-LIFE OF TRITIUM IN MAN* 049222 P 22
RESEARCH* #LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL 016938 P 1
AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY 066272 P 48
ORGANISMS* #LEVELS OF RADIOACTIVITY IN THE MARINE ENVIRONMENT AND THE DOSE COMMITMENT TO MARINE 075321 P 55
IN THE MARINE ENVIRONMENT AND THE DOSE COMMITMENT TO MARINE ORGANISMS* #LEVELS OF RADIOACTIVITY 075321 P 55
#TRITIATION OF AQUATIC ANIMALS IN AN EXPERIMENTAL MARINE POOL* 069935 P 52
FRACTIONATION DURING MOLECULAR HYDROGEN FORMATION IN A MARINE PSEUDOMONAD* #DEUTERIUM 043592 P 20
MARINE SCIENCES* 080624 P 56
IN NORMAL AND CONTINUOUSLY IRRADIATED RAT BONE MARROW STUDIED BY REPEATED LABELLING WITH TRITIATED 054728 P 28
MAN* #TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO ANIMALS AND 068619 P 51
PERIOD JULY 1, #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE 082903 P 58
FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF #EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W 064773 P 44
WATER (MPC)*W* FROM INTERSPECIES #ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN 051573 P 26
#INDUCTION OF LEUKEMIA IN THE C57 BL MOUSE BY MEANS OF TRITIATED THYMIDINE* 040778 P 7
INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND TRITIUM.* (MPC)*W* FROM 051573 P 26
FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND TRITIUM (T1643)*WATER (MPC)W 064773 P 44
WATER. II. CRITICAL STUDY OF TECHNIQUES FOR ANALYSIS AND MEASUREMENT OF RADIOACTIVITY OF WATER AND TRITIATED LEAF 042767 P 14
AND CHEMICAL METHODS (T1858)* # MEASUREMENTS OF DNA IN HIGHER PLANTS BY FEULGEN PHOTOMETRY 064736 P 33
MODEL ANALYSIS OF THYMIDINE INCORP INTO MOUSE DNA AND MECHANISM OF RADIATION EFFECTS (T1252)* #FOUR-FACTOR 064745 P 35
PERMEABILITY OF THE SKIN TO DEUTERATED AND #A STUDY OF THE MECHANISM OF WATER ACROSS FROG SKIN BY A COMPARISON OF THE 041892 P 12
#BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1965* 013818 P 1
#PROCEEDINGS FROM VERMONT MEETING* 044378 P 21
GAMMA IRRADIATION ON THE MORTALITY OF THE ADULT DROSOPHILA MELANOGASTER LARVAE (PART II)* OF TRITIATED THYMIDINE AND 040783 P 8
A CYTOPLASMIC COMPONENT OF THE ADULT TESTIS OF DROSOPHILA MELANOGASTER* AND EVIDENCE FOR ITS INCORPORATION INTO 040789 P 10
#UPTAKE OF TRITATED THYMIDINE IN THE ROOT TIP MERISTEM OF VICIA FABA (L)* 040791 P 10
#CYTOLOGICAL EFFECTS OF TRITIATED WATER (THO) ON ROOT-TIP MERISTEMS OF ALLIUM CEPA L* 043274 P 18
ON THE MOUSE* #STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. GROSS STUDIES 043591 P 20
STUDIES ON THE MOUSE* #STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. I. GROSS 049604 P 24
COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.*#STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. 051582 P 27
PREDOMINANTLY NON-DYNAMIC STATE OF BODY #STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS TRACER. 5. 067124 P 50
#THYMIDINE METABOLISM - PATHWAYS OF INCORPORATION AND DEGRADATION* 064764 P 42
INHIBITION (T7597)* #THYMIDINE METABOLISM - THE FOUR-FACTOR MODEL, POOL SIZES AND GROWTH 064765 P 42
METABOLISM AND FATE OF TRITIATED THYMIDINE IN MAN (T7585)* 064747 P 36
#THYMIDINE METABOLISM AND H3 THYMIDINE SUICIDE IN MAMMALIAN CELLS* 041574 P 11
#COMPARISON OF H3- AND C14-GLUCOSE METABOLISM IN THE INTACT RAT* 067023 P 48
#COMPARATIVE METABOLISM OF TRITIATED WATER BY MAMMALS* 043593 P 20
* #ABSORPTION AND METABOLISM OF TRITIUM OXIDE AND TRITIUM GAS BY BEAN PLANTS. 051228 P 26
#THE GROSS RETENTION AND METABOLISM OF TRITIUM OXIDE IN THE MOUSE.* 051748 P 27
#USE OF RADIOISOTOPES IN RESEARCH IN ANIMAL METABOLISM.* 050527 P 25
VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM METABOLISM* AND COMPARTMENTS IN THE RAIN FOREST AT EL 021312 P 2
MEASUREMENT OF RADIOACTIVITY OF WATER AND TRITIATED LEAF METABOLITES.*CRITICAL STUDY OF TECHNIQUES FOR ANALYSIS AND 042767 P 14
#TRITIUM TRANSFER TO FOOD ITEMS FROM TRITIATED METHANE USED FOR DOMESTIC COOKING* 078468 P 56
OF DNA IN HIGHER PLANTS BY FEULGEN PHOTOMETRY AND CHEMICAL METHODS (T1858)* #MEASUREMENTS 064736 P 33
RADIATION DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2- METHYL-1,4-NAPHTHAQUINCL DIPHOSPHATE*UPTAKE HALF-LIVES AND 049600 P 23
TRITIATED THYMIDINE ON REPRODUCTIVE CAPACITY OF MICE (T2297)*#DELETERICUS INFLUENCE OF ORALLY ADMINISTERED 064757 P 39
OF H3-CYTIDINE ON ITS INCORP INTO TISSUES OF YOUNG AND OLD MICE (T2675)* #EFFECT OF SPECIFIC ACTIVITY 064752 P 38
#TOXICITY OF TRITIUM OXIDE IN MICE AND RATS SUBJECTED TO INTRAPERITONEAL INJECTION* 040678 P 6
#TUMOR INDUCTION IN MICE BY RADIOACTIVE THYMIDINE (T3356)* 064735 P 33
BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM 054897 P 28
THE 3H-INDEX AND THE MITOTIC INDEX IN CELL TYPES OF ADULT MICE, RAT FETUSES, ASCITES TUMOR CELLS* FLUCTUATIONS IN 040668 P 4
#TRITIUM - DISCRIMINATION AND CONCENTRATION IN FRESH WATER MICROCOSMS* 067798 P 51
FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL VARIABLES* #A SYSTEM 069396 P 51
OF TRITIATED WATER* #TRITIUM SECRETION INTO COW'S MILK AFTER ADMINISTRATION OF ORGANICALLY BOUND TRITIUM AND 075319 P 54
#TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* 065163 P 47
OF DIURNAL FLUCTUATIONS IN THE 3H-INDEX AND THE MITOTIC INDEX IN CELL TYPES OF ADULT MICE, RAT FETUSES, 040668 P 4
MECHANISM OF RADIATION EFFECTS (T1252)* #FOUR-FACTOR MODEL ANALYSIS OF THYMIDINE INCORP INTO MOUSE DNA AND 064745 P 35
#THYMIDINE METABOLISM - THE FOUR-FACTOR MODEL, POOL SIZES AND GROWTH INHIBITION (T7597)* 064765 P 42
REPORT 1971, CENTRE D'ETUDE DE LENERGIE NUCLEAIRE, MOL (BELGIUM)* #ANNUAL SCIENTIFIC 081542 P 57
#DEUTERIUM FRACTIONATION DURING MOLECULAR HYDROGEN FORMATION IN A MARINE PSEUDOMONAD* 043592 P 20
LABELED CEREBROSIDES (GALACTOSYL CERAMIDE) RADIOACTIVITY BY MONKEYS* #DISTRIBUTION AND EXCRETION OF TRITIUM 056181 P 29
#RADIOAUTOGRAPHIC PROCESSING SEQUENCE FOR COVERSLIP MONOLAYER TISSUE CULTURES LABELED WITH TRITIATED THYMIDINE* 041890 P 12
EFFECT OF TRITIATED THYMIDINE AND GAMMA IRRADIATION ON THE MORTALITY OF THE ADULT DROSOPHILA MELANOGASTER LARVAE (040783 P 8
OFFSPRING OF RATS IN #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE 049639 P 24
OFFSPRING OF RATS IN THE #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE 043364 P 19
OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE (T2297)* #INCORPORATION 064726 P 32
#INDUCTION OF LEUKEMIA IN THE C57 BL MOUSE BY MEANS OF TRITIATED THYMIDINE* 040778 P 7
#FOUR-FACTOR MODEL ANALYSIS OF THYMIDINE INCORP INTO MOUSE DNA AND MECHANISM OF RADIATION EFFECTS (T1252)* 064745 P 35
BIOLOGICAL EFFECTIVENESS OF TRITRIUM ON PREIMPLANTATION MOUSE EMBRYOS* #THE RELATIVE 082373 P 57
#INCORPORATION OF THYMIDINE INTO DNA OF MOUSE ORGANS (T0031)* 064738 P 34
#THE FATE OF ISOTOPE-LABELLED UTERINE SPERMATOZOA IN THE MOUSE POSTCOITUM* 041894 P 13
#EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (T2297)* 064741 P 35
#STUDIES ON INCORP OF TRITIATED THYMIDINE IN DNA OF MOUSE TISSUES AND ON ITS RADIATION EFFECTS (T2297)* 064758 P 40
#MUTATIONS INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.* 051968 P 27

OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE* #INCORPORATION 040775 P 7
TURNOVER WITH TRITIUM AS A TRACER. GROSS STUDIES ON THE MOUSE* #STUDIES OF METABOLIC 043591 P 20
TURNOVER WITH TRITIUM AS A TRACER. I. GROSS STUDIES ON THE MOUSE* #STUDIES OF METABOLIC 049604 P 24
#THE GROSS RETENTION AND METABOLISM OF TRITIUM OXIDE IN THE MOUSE.* 051748 P 27
#THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE MOUSE, RAT, GUINEA-PIG AND RABBIT UNDER TROPICAL 043182 P 18
0 MOVEMENT AND DISTRIBUTION OF TRITIATED WATER IN PLANTS.* 051226 P 26
#RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST* 056628 P 29
#TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST* 028688 P 3
HELIANTHUS ANNUUS IN THE PRESENCE AND ABSENCE OF # MOVEMENT OF TRITIATED WATER IN THE ROOT SYSTEM OF 043304 P 19
MOVEMENT OF TRITIUM IN ECOLOGICAL SYSTEMS* 069508 P 52
PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF 051573 P 26
#EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF 064773 P 44
HONEY BEE* #A QUANTITATIVE STUDY OF THE MUTAGENIC EFFECT OF TRANSMUTATION IN DROSOPHILA AND THE 040680 P 6
SPERMATOCYTES* #THE MUTAGENIC EFFECT OF TRITIATED URIDINE IN DROSOPHILA 040780 P 8
INCORPORATED TRITIUM IN ESCHERICHIA COLI* #EVIDENCE FOR A MUTAGENIC LOCAL EFFECT ACCOMPANYING THE DECAY OF 040779 P 8
MUTATIONS INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.* 051968 P 27
#LETHALITY AND MUTATIONS PRODUCED BY TRITIUM DECAY IN BACTERIOPHAGES* 040683 P 7

OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4- NAPHTHAQUINOL DIPHOSPHATE* HALF-LIVES AND RADIATION DOSES 049600 P 23
TRITIUM IN RECENT YEARS* # NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND 043102 P 16
AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* #TRANSFER 065163 P 47
DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN CONDITIONS NATURELLES* #TRANSFER ET INCORP DU TRITIUM 064781 P 45
SELECTED LOCATIONS IN THE UNITED STATES, INCLUDING AREAS NEAR NUCLEAR FACILITIES* #TRITIUM IN PINE TREES FROM 073994 P 53
#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 33
NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 049713 P 25
#LABELING OF DNA AND CELL DIVISION IN SO CALLED NON-DIVIDING TISSUES* 064744 P 35
METABOLIC TURNOVER WITH TRITIUM AS TRACER. 5. PREDOMINANTLY NON-DYNAMIC STATE OF BODY CONSTITUENTS IN RAT (T7735)* OF 067124 P 50
IGENSTION* #RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE 049684 P 24
BY REPEATED LABELLING WITH #CELLULAR PROLIFERATION IN NORMAL AND CONTINUOUSLY IRRADIATED RAT BONE MARROW STUDIED 054728 P 28
TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (T2297)* 066759 P 40
SCIENCES* #PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC 065087 P 46
#ANNUAL SCIENTIFIC REPORT 1971, CENTRE D'ETUDE DE LENERGIE NUCLEAIRE, MOL (BELGIUM)* 081542 P 57
#3H THYMIDINE CORPORATION INTO NUCLEAR DNA OF LEAF CELLS* 041888 P 11
LOCATIONS IN THE UNITED STATES, INCLUDING AREAS NEAR NUCLEAR FACILITIES* #TRITIUM IN PINE TREES FROM SELECTED 073994 P 53
PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, 066272 P 48
#RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE EUREX NUCLEAR PLANT* 075309 P 54
ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* #AEC COMMENTS 038641 P 3
PRECURSORS OF NUCLEIC ACID* # NUCLEAR RADIOLESIONS CAUSED BY THE USE OF RADIOACTIVE 040674 P 5
#STRUCTURAL AND FUNCTIONAL PROPERTIES OF POLYTENE NUCLEI ISOLATED FROM SALIVARY GLANDS OF DROSOPHILA HYDEI* 041893 P 12
TRITIATED THYMIDINE INTO DEOXYRIBONUCLEIC ACID BY ISOLATED NUCLEI.* #INCORPORATION OF 051975 P 27
RADIOLESIONS CAUSED BY THE USE OF RADIOACTIVE PRECURSORS OF NUCLEIC ACID* #NUCLEAR 040674 P 5
TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* #INCORPORATION OF 064766 P 42
#LETHALITY FROM 3H- NUCLEOSIDES INCORPORATED IN MAMMALIAN CELLS* 041899 P 13
AMINO ACIDS* #TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED 040785 P 9
#DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)* 064753 P 38

#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 33
MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN PERIODS OF PRENATAL AND POSTNATAL LIFE 049639 P 24
MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN THE PERIODS OF PRENATAL AND POSTNATAL 043364 P 19
OF H3-CYTIDINE ON ITS INCORP INTO TISSUES OF YOUNG AND OLD MICE (T2675)* #EFFECT OF SPECIFIC ACTIVITY 064752 P 38
OF RADIOCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS.* AND TRANSPORT 051309 P 26
OF RADIONCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS* AND TRANSPORT 043086 P 15
#INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (T2243)* 064748 P 36
CAPACITY OF MICE (T2297)* #DELETERIOUS INFLUENCE OF ORALLY ADMINISTERED TRITIATED THYMIDINE ON REPRODUCTIVE 064757 P 39
#TRITIUM SECRETION INTO COW'S MILK AFTER ADMINISTRATION OF ORGANICALLY BOUND TRITIUM AND OF TRITIATED WATER* 075319 P 54
OF HEAVY HYDROGEN IN THE AQUEOUS PHASE OF THE RABBIT ORGANISM AFTER PROLONGED ADMINISTRATION OF TRITIUM OXIDE* 043365 P 19
#THE EFFECTS OF TRITIUM OXIDE ON AQUATIC ORGANISMS* 043088 P 15
IN THE MARINE ENVIRONMENT AND THE DOSE COMMITMENT TO MARINE ORGANISMS* #LEVELS OF RADIOACTIVITY 075321 P 55
#THE EFFECTS OF TRITIUM OXIDE ON AQUATIC ORGANISMS. FINAL REPORT, JUNE 1, 1962 - JULY 31, 1964* 043180 P 18
#INCORPORATION OF THYMIDINE INTO DNA OF MOUSE ORGANS (T0031)* 064738 P 34
#TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS* 040785 P 9
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 31
#ABSORPTION AND METABOLISM OF TRITIUM OXIDE AND TRITIUM GAS BY BEAN PLANTS.* 051228 P 26
DEVELOPMENT OF THE OFFSPRING OF RATS #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF 043364 P 19
DEVELOPMENT OF THE OFFSPRING OF RATS #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF 049639 P 24
DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE IGENSTION* #RADIATION 049684 P 24
INJECTION* #TOXICITY OF TRITIUM OXIDE IN MICE AND RATS SUBJECTED TO INTRAPERITONEAL 040678 P 6
#THE GROSS RETENTION AND METABOLISM OF TRITIUM OXIDE IN THE MOUSE.* 051748 P 27
JULY 31, 1964* #THE EFFECTS OF TRITIUM OXIDE ON AQUATIC ORGANISMS. FINAL REPORT, JUNE 1, 1962 - 043180 P 18
#THE EFFECTS OF TRITIUM OXIDE ON AQUATIC ORGANISMS* 043088 P 15
#EFFECT OF TRITIUM OXIDE ON THE FERTILITY OF MALES* 042766 P 14
#TISSUE DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE TO RABBITS* 067165 P 51
VARIABLES* #A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL 069396 P 51
#TRITIUM OXIDE* 075281 P 54
#DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE* 056179 P 29
AND TEMPERATURE ON PERCUTANEOUS ABSORPTION OF TRITIUM OXIDE* #EFFECT OF SEASON 049607 P 24
AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO TRITIUM OXIDE* #EFFECT OF BODY DISTRIB 064778 P 44
RABBIT ORGANISM AFTER PROLONGED ADMINISTRATION OF TRITIUM OXIDE* OF HEAVY HYDROGEN IN THE AQUEOUS PHASE OF THE 043365 P 19
#PERCUTANEOUS ABSORPTION OF TRITIUM OXIDE.* 051628 P 27
OF TEMPERATURE AND RADIATION UPON LARVAE OF A PACIFIC OYSTER*COLUMBIA RIVER STUDIES 1969-1970, APPENDIX, EFFECTS 018273 P 1
OYSTER, ESTIMATION OF BIOLOGICAL HALF-LIFE FOR ZN IN OYSTER*Y-90, AND SR-90 + Y-90 ON THE LARVAE OF THE PACIFIC 048349 P 22
RADIATION AND TEMPERATURE ON THE LARVAE OF THE PACIFIC OYSTER, CRASSOSTREA GIGAS* #EFFECTS OF IONIZING 066269 P 48

TRITIUM Y-90, AND SR-90 + Y-90 ON THE LARVAE OF THE PACIFIC OYSTER, ESTIMATION OF BIOLOGICAL HALF-LIFE FOR ZN IN OYSTER 048349 P 22

OF TRANSLOCATION IN THE PHLOEM OF THE BEAN PLANT USING THO, P-32, AND C-14.* #AN ANALYSIS 051223 P 26
ECOLOGIC SCIENCES* # PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, 065087 P 46
EFFECTS OF TEMPERATURE AND RADIATION UPON LARVAE OF A PACIFIC OYSTER*COLUMBIA RIVER STUDIES 1969-1970, APPENDIX, 018273 P 1
OF IONIZING RADIATION AND TEMPERATURE ON THE LARVAE OF THE PACIFIC OYSTER, CRASSOSTREA GIGAS* #EFFECTS 066269 P 48
OF TRITIUM Y-90, AND SR-90 + Y-90 ON THE LARVAE OF THE PACIFIC OYSTER, ESTIMATION OF BIOLOGICAL HALF-LIFE FOR ZN 048349 P 22
STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING GROUND* #PRELIMINARY 040781 P 8
#8 PAGES, IMMUNOLOGY, VOL. 16, PAGES 83-90 (JANUARY 1969)* 041891 P 12
#8 PAGES, IMMUNOLOGY, VOL. 16, PAGES 83-90 (JANUARY 1969)* 041891 P 12
#BIOLOGICAL STUDY OF A TRITIATED LUMINOUS PAINT* 043104 P 16
#CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (T1510)* 064743 P 35
#BODY WATER TURNOVER IN CATTLE WITH PARASITIC GASTROENTERITIS* 041887 P 11
THE MORTALITY OF THE ADULT DROSOPHILA MELANOGASTER LARVAE (PART II)* OF TRITIATED THYMIDINE AND GAMMA IRRADIATION ON 040783 P 8
#THYMIDINE METABOLISM - PATHWAYS OF INCORPORATION AND DEGRADATION* 064764 P 42
OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS* #TRANSFER 043246 P 18
#TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL 049600 P 23
PERIODS #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN 049639 P 24
THE #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN 043364 P 19
COMPOUND* # PERCUTANEOUS ABSORPTION BY RATS OF TRITIUM FROM A LUMINOUS 047885 P 22
PERCUTANEOUS ABSORPTION OF TRITIUM OXIDE.* 051628 P 27
#EFFECT OF SEASON AND TEMPERATURE ON PERCUTANEOUS ABSORPTION OF TRITIUM OXIDE* 049607 P 24
FROM 3H-THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS* ABERATIONS RESULTING 041900 P 13
OF DEVELOPMENT OF THE OFFSPRING OF RATS IN THE PERIODS OF PRENATAL AND POSTNATAL LIFE* AND PECULIARITIES 043364 P 19
PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN PERIODS OF PRENATAL AND POSTNATAL LIFE*MOTHER TO FETUS AND 049639 P 24
MECHANISM OF WATER ACROSS FROG SKIN BY A COMPARISON OF THE PERMEABILITY OF THE SKIN TO DEUTERATED AND TRITIATED WATER* 041892 P 12
MPC)*W* FROM INTERSPECIES #ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN WATER (051573 P 26
INTERSPECIES CORRELATIONS. I. COMPARISON OF #EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM 064773 P 44
T7721)* # PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (067088 P 49
GROUND* #PRELIMINARY STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING 040781 P 8
COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM METABOLISM* AND 021312 P 2
OF THE ACCUMULATION OF HEAVY HYDROGEN IN THE AQUEOUS PHASE OF THE RABBIT ORGANISM AFTER PROLONGED 043365 P 19
#AN ANALYSIS OF TRANSLOCATION IN THE PHLOEM OF THE BEAN PLANT USING THO, P-32, AND C-14.* 051223 P 26
#MEASUREMENTS OF DNA IN HIGHER PLANTS BY FEULGEN PHOTOMETRY AND CHEMICAL METHODS (T1858)* 064736 P 33
#RADIOAUTOGRAPHY OF TRITIATED PHOTOSYNTHATE ARISING FROM HTO.* 051225 P 26
#GLYCOLIC ACID LABELING DURING PHOTOSYNTHESIS WITH C(14)O2 AND TRITIATED WATER* 042770 P 14
CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31* 066272 P 48
PHYSICS OF CELLULAR SYNTHESIS, GROWTH, AND DIVISION* 040679 P 6
PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (T0226)* 064727 P 32
PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (T0226)* 064728 P 32
#ISOTOPE STUDIES ON THE PHYSIOLOGY OF DOMESTIC ANIMALS (HPIS/133)* 077006 P 55
OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY 042769 P 14
HALF-LIFE OF TRITIATED WATER IN THE MOUSE, RAT, GUINEA- PIG AND RABBIT UNDER TROPICAL CONDITIONS AND THE EFFECT OF 043182 P 18
(VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, RABBIT, GUINEA PIG, AND MAN, AND OF THE BIOLOGICAL HALF-LIFE OF TRITIUM 049222 P 22
INCLUDING AREAS NEAR NUCLEAR FACILITIES* #TRITIUM IN PINE TREES FROM SELECTED LOCATIONS IN THE UNITED STATES, 073994 P 53
SEX, HORMONAL STATE ON TRITIATED THYMIDINE UPTAKE BY RAT PITUITARY (T4647)* #EFFECT OF AGE, 064751 P 37
STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. I. INTRODUCTION - BIBLIOGRAPHIC 042769 P 14
#AN ANALYSIS OF TRANSLOCATION IN THE PHLOEM OF THE BEAN PLANT USING THO, P-32, AND C-14.* 051223 P 26
STUDIES OF THE ENVIRONMENT OF THE EUREX NUCLEAR PLANT* #RADIOECOLOGICAL 075309 P 54
#MEASUREMENTS OF DNA IN HIGHER PLANTS BY FEULGEN PHOTOMETRY AND CHEMICAL METHODS (T1858)* 064736 P 33
RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* #AEC COMMENTS ON TRITIUM 038641 P 3
#MOVEMENT AND DISTRIBUTION OF TRITIATED WATER IN PLANTS.* 051226 P 26
AND METABOLISM OF TRITIUM OXIDE AND TRITIUM GAS BY BEAN PLANTS.* #ABSORPTION 051228 P 26
#COMPARISON OF HTO IN PLASMA AND EXPIRED WATER VAPOR* 064783 P 45
TOCOPHEROLS #COMPARISON OF INTESTINAL ABSORPTION, LYMPH AND PLASMA TRANSPORT, AND TISSUE UPTAKE OF ALPHA- AND GAMMA- 067133 P 50
IN CELLS AND ITS INCORP INTO DNA (T1858A)* #DELAY AFTER PLUCKING OF HAIRS BETWEEN THE APPEARANCE OF H3-THYMIDINE 064750 P 37
#THE EFFECTS OF CHRONIC IRRADIATION BY TRITIATED WATER ON POECILIA RETICULATE, THE GUPPY* 026846 P 2
#RADIATION EFFECTS POLY-DAT FROM INTRAMOLECULAR TRITIUM* 041895 P 13
DROSOPHILA HYDEI* #STRUCTURAL AND FUNCTIONAL PROPERTIES OF POLYTENE NUCLEI ISOLATED FROM SALIVARY GLANDS OF 041893 P 12
#THYMIDINE METABOLISM - THE FOUR-FACTOR MODEL, POOL SIZES AND GROWTH INHIBITION (T7597)* 064765 P 42
#TRITIATION OF AQUATIC ANIMALS IN AN EXPERIMENTAL MARINE POOL* 069935 P 52
TRITIATION OF AQUATIC ANIMALS IN AN EXPERIMENTAL FRESHWATER POOL* # 045046 P 21
#RENEWAL OF CELL POPULATIONS (T2693)* 064754 P 38
I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. 042769 P 14
FATE OF ISOTOPE-LABELLED UTERINE SPERMATOZOA IN THE MOUSE POSTCOITUM* #THE 041894 P 13
OF THE OFFSPRING OF RATS IN PERIODS OF PRENATAL AND POSTNATAL LIFE* TO FETUS AND PECULIARITIES OF DEVELOPMENT 049639 P 24
OF THE OFFSPRING OF RATS IN THE PERIODS OF PRENATAL AND POSTNATAL LIFE* TO FETUS AND PECULIARITIES OF DEVELOPMENT 043364 P 19
- ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND 064759 P 40
CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST 044471 P 21
TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* #AEC COMMENTS ON 038641 P 3
ADMINISTRATION (#SPECIFICITY OF TRITIATED THYMIDINE AS A PRECURSOR OF DNA UNDER CONDITIONS OF PROLONGED 064762 P 41
#NUCLEAR RADIOLESIONS CAUSED BY THE USE OF RADIOACTIVE PRECURSORS OF NUCLEIC ACID* 040674 P 5
#STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS TRACER. 5. PREDOMINANTLY NON-DYNAMIC STATE OF BODY CONSTITUENTS IN 067124 P 50
#THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITRIUM ON PREIMPLANTATION MOUSE EMBRYOS* 082373 P 57
TRITIATED THYMIDINE* # PRELIMINARY ESTIMATE OF THE HAZARD FROM INGESTION OF 058835 P 30
IN THE PACIFIC PROVING GROUND* # PRELIMINARY STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C 040781 P 8
OF DEVELOPMENT OF THE OFFSPRING OF RATS IN THE PERIODS OF PRENATAL AND POSTNATAL LIFE* TO FETUS AND PECULIARITIES 043364 P 19
OF DEVELOPMENT OF THE OFFSPRING OF RATS IN PERIODS OF PRENATAL AND POSTNATAL LIFE* TO FETUS AND PECULIARITIES 049639 P 24
WATER IN THE ROOT SYSTEM OF HELIANTHUS ANNUUS IN THE PRESENCE AND ABSENCE OF TRANSPORTATION* OF TRITIATED 043304 P 19
#THE KINETICS OF BIOLOGICAL PROCESSES. SPECIAL PROBLEMS CONNECTED WITH THE USE OF TRACERS.* 052980 P 28
WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* 042769 P 14
PROCEEDINGS FROM VERMONT MEETING* 044378 P 21
TRACERS.* #THE KINETICS OF BIOLOGICAL PROCESSES. SPECIAL PROBLEMS CONNECTED WITH THE USE OF 052980 P 28
CULTURES LABELED WITH TRITIATED THYMYDINE*#RADIOAUTOGRAPHIC PROCESSING SEQUENCE FOR COVERSLIP MONOLAYER TISSUE 041890 P 12
#LETHALITY AND MUTATIONS PRODUCED BY TRITIUM DECAY IN BACTERIOPHAGES* 040683 P 7

THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF 044471 P 21
RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE 054897 P 28
BONE MARROW STUDIED BY REPEATED LABELLING WITH #CELLULAR PROLIFERATION IN NORMAL AND CONTINUOUSLY IRRADIATED RAT 054728 P 28
#IN VITRO AUTORADIOGRAPHIC STUDIES OF CELL PROLIFERATION IN THE GASTROINTESTINAL TRACT OF MAN* 040670 P 5
THYMIDINE AS A PRECURSOR OF DNA UNDER CONDITIONS OF PROLONGED ADMINISTRATION (T7590)*#SPECIFICITY OF TRITIATED 064762 P 41
HYDROGEN IN THE AQUEOUS PHASE OF THE RABBIT ORGANISM AFTER PROLONGED ADMINISTRATION OF TRITIUM OXIDE* OF HEAVY 043365 P 19
OF THE CELL-CYCLE AND TIME OF SYNTHESIS OF #BIOLOGICAL PROPERTIES AND RADIOSENSITIVITY OF TUMOURS. DETERMINATION 054673 P 28
GLANDS OF DROSOPHILA HYDEI* #STRUCTURAL AND FUNCTIONAL PROPERTIES OF POLYTENE NUCLEI ISOLATED FROM SALIVARY 041893 P 12
#AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* 038641 P 3
#SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM* 013458 P 1
3H THYMIDINE - DOSIMETRIC, RADIOLOGICAL AND RADIATION PROTECTION ASPECTS* #INTRANUCLEAR 040776 P 7
H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION ASPECTS* #INTRANUCLEAR 049714 P 25
#TRITIATED THYMIDINE EFFECTS ON DAN, RNA, AND PROTEIN SYNTHETIC RATES IN SYNCHRONIZED L-CELLS* 040671 P 5
#LABELING OF PROTEINS BY IRRADIATION IN TRITIATED WATER (T26178)* 067143 P 50
#INCORPORATION OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE (T2297)* 064726 P 32
#INCORPORATION OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE* 040775 P 7
#LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS* 040792 P 10
OF THE PERSISTENCE OF TRITIUM AND 14C IN THE PACIFIC PROVING GROUND* #PRELIMINARY STUDIES 040781 P 8
DURING MOLECULAR HYDROGEN FORMATION IN A MARINE PSEUDOMONAD* #DEUTERIUM FRACTIONATION 043592 P 20
BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM 021312 P 2
#INCORPORATION OF RADIOACTIVE LABEL FROM PYRIMIDINES INTO LIVER LIPIDS (T7596)* 064761 P 41
#ON THE DIFFERENCE BETWEEN THE LETHAL EFFECTS OF H3 AND P32 IN BACTERIA* 041889 P 11

#THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS* 049712 P 25
RADIOCHEMISTRY* # QUANTITATIVE EVALUATION OF TRITIUM IN AUTORADIOGRAPHY AND 043093 P 16
TRANSMUTATION IN DROSOPHILA AND THE HONEY BEE* #A QUANTITATIVE STUDY OF THE MUTAGENIC EFFECT OF 040680 P 6

ACCUMULATION OF HEAVY HYDROGEN IN THE AQUEOUS PHASE OF THE RABBIT ORGANISM AFTER PROLONGED ADMINISTRATION OF TRITIUM 043365 P 19
LIFE OF TRITIATED WATER IN THE MOUSE, RAT, GUINEA-PIG AND RABBIT UNDER TROPICAL CONDITIONS AND THE EFFECT OF CLIMATE 043182 P 18
TOTAL BODY WATER (VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, RABBIT, GUINEA PIG, AND MAN, AND OF THE BIOLOGICAL HALF- 049222 P 22
DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE TO RABBITS* #TISSUE 067165 P 51
RADIAL EXCHANGE OF LABELED WATER IN INTACT MAIZE ROOTS* 043359 P 19
RADIAL EXCHANGE OF LABELED WATER IN MAIZE ROOTS* 043092 P 15
OF REVERTANTS OF TWO LOCI IN E. COLI WWU - A STUDY OF RADIATION ACTION ON THE GENE* #THE CHARACTERIZATION 040682 P 7
OYSTER, CRASSOSTREA GIGAS* #EFFECTS OF IONIZING RADIATION AND TEMPERATURE ON THE LARVAE OF THE PACIFIC 066269 P 48
RADIATION DECOMPOSITION OF TRITIUM-LABELED COMPOUNDS* 040784 P 9
RADIATION DOSE DUE TO ACUTE INTAKE OF TRITIUM BY MAN* 071505 P 53
TRITIUM OXIDE IGENSTION* # RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER 049684 P 24
2-METHYL-1,4-NAPHTHAQUINOL #TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 049600 P 23
FOLIC ACID AND TRITIATED WATER IN THE RAT* # RADIATION DOSES RESULTING FROM ADMINISTRATION OF TRITIATED 062623 P 31
THYMIDINE BY THE RAT* # RADIATION DOSES RESULTING FROM THE INGESTION OF TRITIATED 049587 P 23
TRITIATED CORTICOSTEROIDS TO THE RAT* #ESTIMATION OF RADIATION DOSES TO TISSUES AFTER ADMINISTRATION OF 049588 P 23
AND RETENTION OF TRITIUM IN EMBRYO AND LARVAL FISH AND RADIATION EFFECT* #ACCUMULATION 065955 P 48
OF THYMIDINE INCORP INTO MOUSE DNA AND MECHANISM OF RADIATION EFFECTS (T1252)* #FOUR-FACTOR MODEL ANALYSIS 064745 P 35
OF TRITIATED THYMIDINE IN DNA OF MOUSE TISSUES AND ON ITS RADIATION EFFECTS (T2297)* #STUDIES ON INCORP 064758 P 40
SOYBEANS.* # RADIATION EFFECTS OF CARBON-14 AND TRITIUM ON GROWTH OF 054625 P 28
RADIATION EFFECTS POLY-DAT FROM INTRAMOLECULAR TRITIUM* 041895 P 13
THE RAT* # RADIATION EFFECTS UPON WATER ABSORPTION AND EXCRETION IN 040665 P 4
ENVIRONMENT* #ECOLOGY AND RADIATION EXPOSURE OF KANGAROO RATS LIVING IN A TRITIATED 060607 P 30
T2333)* #REPRODUCTIVE DEATH OF MAMMALIAN CELLS DUE TO BETA- RADIATION FROM INCORPD THYMIDINE LABELED WITH H-3 OR C-14 (064746 P 36
#LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH* 016938 P 1
REPORT ON USE OF TRITIATED THYMIDINE AS INTERNAL SOURCE OF RADIATION IN STUDY OF LATERAL ROOT INITIATION, 1965-1966* 040782 P 8
#INTRANUCLEAR 3H THYMIDINE - DOSIMETRIC, RADIOLOGICAL AND RADIATION PROTECTION ASPECTS* 040776 P 7
H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION ASPECTS* #INTRANUCLEAR 049714 P 25
STUDIES 1969-1970, APPENDIX, EFFECTS OF TEMPERATURE AND RADIATION UPON LARVAE OF A PACIFIC OYSTER* #COLUMBIA RIVER 018273 P 1
#THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA- RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST 051314 P 26
UPTAKE* # RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL 061130 P 31
T7596)* #INCORPORATION OF RADIOACTIVE LABEL FROM PYRIMIDINES INTO LIVER LIPIDS (064761 P 41
ANIMALS AND MAN* #TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO 068619 P 51
ALAMOS FOR THE PERIOD JULY 1, #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS 082903 P 58
#NUCLEAR RADIOLESIONS CAUSED BY THE USE OF RADIOACTIVE PRECURSORS OF NUCLEIC ACID* 040674 P 5
#TUMOR INDUCTION IN MICE BY RADIOACTIVE THYMIDINE (T3356)* 064735 P 33
OF TRITIUM LABELED CEREBROSIDES (GALACTOSYL CERAMIDE) RADIOACTIVITY BY MONKEYS* #DISTRIBUTION AND EXCRETION 056181 P 29
COMMITMENT TO MARINE ORGANISMS* #LEVELS OF RADIOACTIVITY IN THE MARINE ENVIRONMENT AND THE DOSE 075321 P 55
STUDY OF TECHNIQUES FOR ANALYSIS AND MEASUREMENT OF RADIOACTIVITY OF WATER AND TRITIATED LEAF METABOLITES.* 042767 P 14
MONOLAYER TISSUE CULTURES LABELED WITH TRITIATED THYMYDINE*# RADIOAUTOGRAPHIC PROCESSING SEQUENCE FOR COVERSLIP 041890 P 12
HTO.* # RADIOAUTOGRAPHY OF TRITIATED PHOTOSYNTHATE ARISING FROM 051225 P 26
#INTRANUCLEAR H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION ASPECTS* 049714 P 25
#REVIEW OF LABORATORY ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF TRITIUM (T7609)* 064777 P 44
#QUANTITATIVE EVALUATION OF TRITIUM IN AUTORADIOGRAPHY AND RADIOCHEMISTRY* 043093 P 16
ONION ROOTS OF DIFFERENT CHLORIDE #UPTAKE AND TRANSPORT OF RADIOCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF 051309 P 26
OF THE HONEYBEE AS AN INDICATOR OF ENVIRONMENTAL RADIOCONTAMINATION* #THE APPLICABILITY 082345 P 57
NUCLEAR PLANT* # RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE EUREX 075309 P 54
RAIN FOREST* # RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL 056628 P 29
#USE OF RADIOISOTOPES IN RESEARCH IN ANIMAL METABOLISM.* 050527 P 25
#ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES 051573 P 26
CORRELATIONS. I. #EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM INTERSPECIES 064773 P 44
OF NUCLEIC ACID* #NUCLEAR RADIOLESIONS CAUSED BY THE USE OF RADIOACTIVE PRECURSORS 040674 P 5
#INTRANUCLEAR 3H THYMIDINE - DOSIMETRIC, RADIOLOGICAL AND RADIATION PROTECTION ASPECTS* 040776 P 7
ONION ROOTS OF DIFFERENT CHLORIDE #UPTAKE AND TRANSPORT OF RADIONCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF 043086 P 15
HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED THYMIDINE.* OF THE RAT AT 052834 P 28
CYCLE AND TIME OF SYNTHESIS OF #BIOLOGICAL PROPERTIES AND RADIOSENSITIVITY OF TUMOURS. DETERMINATION OF THE CELL- 054673 P 28

IODINE* # RADIOTOXICITY OF INTRANUCLEAR TRITIUM, 125-IODINE AND 131- 072215 P 53
CONSIDERATION OF #HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO 021312 P 2
#TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST* 028688 P 3
#RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST* 056628 P 29
WATER CONTENT BY TRITIUM DILUTION OF ANIMALS SUBJECTED TO RAPID LIVE-WEIGHT CHANGES* #ESTIMATION OF 042852 P 15
#TURNOVER OF TRITIUM FROM THYMIDINE IN TISSUES OF RAT (T0073)* 064756 P 39
AND TISSUE UPTAKE OF ALPHA- AND GAMMA-TOCOPHEROLS IN RAT (T2788)* ABSORPTION, LYMPH AND PLASMA TRANSPORT, 067133 P 50
5. PREDOMINANTLY NON-DYNAMIC STATE OF BODY CONSTITUENTS IN RAT (T7735)* OF METABOLIC TURNOVER WITH TRITIUM AS TRACER. 067124 P 50
RECOVERY, AND #CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, 052834 P 28
PROLIFERATION IN NORMAL AND CONTINUOUSLY IRRADIATED RAT BONE MARROW STUDIED BY REPEATED LABELLING WITH 054728 P 28
3H-INDEX AND THE MITOTIC INDEX IN CELL TYPES OF ADULT MICE, RAT FETUSES, ASCITES TUMOR CELLS* FLUCTUATIONS IN THE 040668 P 4
#SOME EFFECTS OF TRITIATED THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* 064755 P 39
#EFFECTS OF H3-THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* 064771 P 43
#STUDIES ON LIVER DNA IN TRITIATED KANGAROO RAT LIVING AT SEDAN CRATER* 040664 P 3
AGE, SEX, HORMONAL STATE ON TRITIATED THYMIDINE UPTAKE BY RAT PITUITARY (T4647)* #EFFECT OF 064751 P 37
#COMPARISON OF H3- AND C14-GLUCOSE METABOLISM IN THE INTACT RAT* 067023 P 48
EFFECTS UPON WATER ABSORPTION AND EXCRETION IN THE RAT* #RADIATION 040665 P 4
RESULTING FROM THE INGESTION OF TRITIATED THYMIDINE BY THE RAT* #RADIATION DOSES 049587 P 23
THE ABSORPTION OF TRITIATED WATER FROM THE INTESTINE OF THE RAT* #THE INFLUENCE OF 5-HYDROXYTRYPTAMINE ON 043152 P 17
AFTER ADMINISTRATION OF TRITIATED CORTICOSTEROIDS TO THE RAT* #ESTIMATION OF RADIATION DOSES TO TISSUES 049588 P 23
ON THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE RAT* AND THE EFFECT OF CLIMATE AND SALINE DRINKING 043182 P 18
OF TRITIATED FOLIC ACID AND TRITIATED WATER IN THE RAT* #RADIATION DOSES RESULTING FROM ADMINISTRATION 062623 P 31
OF TOTAL BODY WATER (VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, RABBIT, GUINEA PIG, AND MAN, AND OF THE 049222 P 22
#THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE MOUSE, RAT, GUINEA-PIG AND RABBIT UNDER TROPICAL CONDITIONS AND 043182 P 18
#THE TRITIUM RATE EFFECT IN TYROSINASE-CATALYZED HYDROXYLATION.* 051589 P 27
THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN 064759 P 40
THYMIDINE EFFECTS ON DAN, RNA, AND PROTEIN SYNTHETIC RATES IN SYNCHRONIZED L-CELLS* #TRITIATED 040671 P 5
OF IDENTICAL CHROMOSOMES IN ESCHERICHIA COLI GROWING AT LOW RATES* #EVIDENCE AGAINST THE ALTERNATION OF SYNTHESIS 040666 P 4
#CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND 052834 P 28
#RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE INGESTION* 049684 P 24
TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS* BETWEEN THE BIOLOGICAL HALF-LIFE OF A 047898 P 22
FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN PERIODS OF PRENATAL AND POSTNATAL LIFE* MOTHER TO 049639 P 24
FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN THE PERIODS OF PRENATAL AND POSTNATAL LIFE* TO 043364 P 19
#STUDIES ON LIVER DNA IN TRITIATED KANGAROO RATS LIVING AT SEDAN CRATER* 064770 P 43
#ECOLOGY AND RADIATION EXPOSURE OF KANGAROO RATS LIVING IN A TRITIATED ENVIRONMENT* 060607 P 30
#PERCUTANEOUS ABSORPTION BY RATS OF TRITIUM FROM A LUMINOUS COMPOUND* 047885 P 22
#TOXICITY OF TRITIUM OXIDE IN MICE AND RATS SUBJECTED TO INTRAPERITONEAL INJECTION* 040678 P 6
OF TRITIUM-LABELED WATER IN THE SMALL INTESTINE OF RATS*OF DRUGS ON INTESTINAL CIRCULATION AND THE ABSORPTION 041886 P 11
EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN RATS.* #THE RELATIVE BIOLOGICAL 054914 P 28
CHROMOSOME DUPLICATION IN THE CELL CYCLE AS REVEALED BY X- RAY BREAKAGE AND 3H-THYMIDINE LABELING* #THE STAGE OF 040667 P 4
OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (T7605)* 064772 P 43
#THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* 054897 P 28
FOLLOWING EXPOSURE TO VARYING DOSES OF H-3 -THYMIDINE OR X- RAYS* #THE FREQUENCY OF SISTER CHROMATID EXCHANGES 043155 P 18
#PROGRESS REPORT ON REAPAIR OF DAMAGED DNA IN VIVO* 044763 P 21
CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* #NATURAL 043102 P 16
OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED THYMIDINE.* 052834 P 28
#USE OF TRITIATED WATER (THO) FOR CONTINUOUS REGISTRATION OF INSECT TRANSPIRATION* 043105 P 17
#REVIEW OF LABORATORY ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF TRITIUM (T7609)* 064777 P 44
PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN 054897 P 28
RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA- 051314 P 26
IRON UPTAKE IN RATS.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING 054914 P 28
PREIMPLANTATION MOUSE EMBRYOS* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITRIUM ON 082373 P 57
PLANTS* #AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER 038641 P 3
#THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 3
RENEWAL OF CELL POPULATIONS (T2693)* 064754 P 38
AND CONTINUOUSLY IRRADIATED RAT BONE MARROW STUDIED BY REPEATED LABELLING WITH TRITIATED THYMIDINE.* IN NORMAL 054728 P 28
#THE EFFECTS OF TRITIUM OXIDE ON AQUATIC ORGANISMS. FINAL REPORT, JUNE 1, 1962 - JULY 31, 1964* 043180 P 18
#THE EFFECTS OF TRITIUM DECAY ON DNA. PROGRESS REPORT, JUNE 1, 1966 TO DECEMBER 31, 1966.* 053555 P 28
#BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1965* 013818 P 1
INFLUENCE OF ORALLY ADMINISTERED TRITIATED THYMIDINE ON REPRODUCTIVE CAPACITY OF MICE (T2297)* #DELETERIOUS 064757 P 39
RADIATION FROM INCORPO THYMIDINE LABELED WITH H-3 OR C-14 (# REPRODUCTIVE DEATH OF MAMMALIAN CELLS DUE TO BETA- 064746 P 36
#BIOLOGICAL AND MEDICAL RESEARCH DIVISION ANNUAL REPORT, 1965* 013818 P 1
#USE OF RADIOISOTOPES IN RESEARCH IN ANIMAL METABOLISM.* 050527 P 25
MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH* #LABORATORY TRAINING 016938 P 1
RESIDUAL TRITIUM AT SEDAN CRATER* 023154 P 2
TRITIATED WATER IN THE RAT* #RADIATION DOSES RESULTING FROM ADMINISTRATION OF TRITIATED FOLIC ACID AND 062623 P 31
#DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* 070396 P 52
RAT* #RADIATION DOSES RESULTING FROM THE INGESTION OF TRITIATED THYMIDINE BY THE 049587 P 23
LATE S PERIODS IN HUMAN FIBROBLASTS* #CHROMATID ABERATIONS RESULTING FROM 3H-THYMIDINE INCORPORATION INTO EARLY AND 041900 P 13
#THE GROSS RETENTION AND METABOLISM OF TRITIUM OXIDE IN THE MOUSE.* 051748 P 27
RADIATION EFFECT* #ACCUMULATION AND RETENTION OF TRITIUM IN EMBRYO AND LARVAL FISH AND 065955 P 48
* #EFFECT OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO TRITIUM OXIDE 064778 P 44
OF CHRONIC IRRADIATION BY TRITIATED WATER ON POECILIA RETICULATE, THE GUPPY* #THE EFFECTS 026846 P 2
#THE STAGE OF CHROMOSOME DUPLICATION IN THE CELL CYCLE AS REVEALED BY X-RAY BREAKAGE AND 3H-THYMIDINE LABELING* 040667 P 4
RADIATION ACTION ON THE GENE* #THE CHARACTERIZATION OF REVERTANTS OF TWO LOCI IN E. COLI WWU - A STUDY OF 040682 P 7
RADIOBIOLOGY OF TRITIUM (T7609)* # REVIEW OF LABORATORY ANIMAL EXPERIMENTS RELATED TO THE 064777 P 44
#TRITIUM IN ECOLOGY. A REVIEW.* 053417 P 28
AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM METABOLISM* 021312 P 2
OF TRITIATED THYMIDINE ON SISTER-CHROMATID EXCHANGE IN A RING CHROMOSOME* #EFFECT 040681 P 4
#TRITIUM AND CARBON-14 IN THE TREE RINGS* 043106 P 17
DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS 066272 P 48
AND RADIATION UPON LARVAE OF A PACIFIC OYSTER* #COLUMBIA RIVER STUDIES 1969-1970, APPENDIX, EFFECTS OF TEMPERATURE 018273 P 1
#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 33
#TRITIATED THYMIDINE EFFECTS ON DAN, RNA, AND PROTEIN SYNTHETIC RATES IN SYNCHRONIZED L-CELLS* 040671 P 5
EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.* RELATIVE BIOLOGICAL 051314 P 26
AS INTERNAL SOURCE OF RADIATION IN STUDY OF LATERAL ROOT INITIATION, 1965-1966* ON USE OF TRITIATED THYMIDINE 040782 P 8
ABSENCE OF #MOVEMENT OF TRITIATED WATER IN THE ROOT SYSTEM OF HELIANTHUS ANNUUS IN THE PRESENCE AND 043304 P 19
#UPTAKE OF TRITATED THYMIDINE IN THE ROOT TIP MERISTEM OF VICIA FABA (L)* 040791 P 10

#CYTOLOGICAL EFFECTS OF TRITIATED WATER (THO) ON ROOT-TIP MERISTEMS OF ALLIUM CEPA L* 043274 P 18
#DIFFUSION OF TRITIATED WATER INTO ROOTS AS INFLUENCED BY WATER STATUS OF TISSUE.* 051313 P 26
RADIOCHLORIDE ANC TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS.* AND TRANSPORT OF 051309 P 26
AND TRITIATED WATER BY VARICUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS* OF RADIONCHLORIDE 043086 P 15
#RADIAL EXCHANGE OF LABELED WATER IN MAIZE ROOTS* 043092 P 15
#RADIAL EXCHANGE OF LABELED WATER IN INTACT MAIZE ROOTS* 043359 P 19

UNDER TROPICAL CONDITIONS AND THE EFFECT OF CLIMATE AND SALINE DRINKING ON THE BIOLOGICAL HALF-LIFE OF TRITIATED 043182 P 18
AND FUNCTIONAL PROPERTIES OF POLYTENE NUCLEI ISOLATED FROM SALIVARY GLANDS OF DROSOPHILA HYDEI* #STRUCTURAL 041893 P 12
#MARINE SCIENCES* 080624 P 56
NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES* #PACIFIC 065087 P 46
NUCLEAIRE, MOL (BELGIUM)* #ANNUAL SCIENTIFIC REPORT 1971, CENTRE D'ETUDE DE LENERGIE 081542 P 57
SEPARATED BY DISC ELECTRCPHORESIS* #LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED PROTEINS 040792 P 10
TRITIUM OXIDE* #EFFECT OF SEASON AND TEMPERATURE ON PERCUTANEOUS ABSORPTION OF 049607 P 24
ORGANICALLY BOUND TRITIUM AND OF TRITIATED WATER* #TRITIUM SECRETION INTO COW'S MILK AFTER ADMINISTRATION OF 075319 P 54
#STUDIES ON LIVER DNA IN TRITIATED KANGAROO RATS LIVING AT SEDAN CRATER* 064770 P 43
#RESIDUAL TRITIUM AT SEDAN CRATER* 023154 P 2
#STUDIES ON LIVER DNA IN TRITIATED KANGAROO RAT LIVING AT SEDAN CRATER* 040664 P 3
#TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY* 075246 P 54
NEAR NUCLEAR FACILITIES* #TRITIUM IN PINE TREES FROM SELECTED LOCATIONS IN THE UNITED STATES, INCLUDING AREAS 073994 P 53
SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM* 013458 P 1
SCINTILLATICN SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS* #LIQUID 040792 P 10
WITH TRITIATED THYMYDINE* #RADIOAUTOGRAPHIC PROCESSING SEQUENCE FOR COVERSLIP MONOLAYER TISSUE CULTURES LABELED 041890 P 12
PITUITARY (T4647)* #EFFECT OF AGE, SEX, HCRMONAL STATE ON TRITIATED THYMIDINE UPTAKE BY RAT 064751 P 37
#DISTRIBUTION OF TRITIATED THYMIDINE IN ANIMALS AS SHOWN BY WATER-SOLUBLE AUTORADIOGRAPHY* 040669 P 4
#THE SIGNIFICANCE OF TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 3
#TRITIUM INCORPORATION IN ALGAE AND TRANSFER IN SIMPLE AQUATIC FOOD CHAINS* 061100 P 30
DOSES OF H-3 -THYMIDINE OR X-RAYS* #THE FREQUENCY OF SISTER CHROMATID EXCHANGES FOLLOWING EXPOSURE TO VARYING 043155 P 18
#EFFECT OF TRITIATED THYMIDINE ON SISTER-CHROMATID EXCHANGE IN A RING CHROMOSOME* 040681 P 6
#THYMIDINE METABOLISM - THE FOUR-FACTOR MODEL, POOL SIZES AND GROWTH INHIBITION (T7597)* 064765 P 42
DEUTERATED #A STUDY OF THE MECHANISM OF WATER ACROSS FROG SKIN BY A COMPARISCN OF THE PERMEABILITY OF THE 041892 P 12
ACROSS FROG SKIN BY A COMPARISON OF THE PERMEABILITY OF THE SKIN TO DEUTERATED AND TRITIATED WATER* MECHANISM OF WATER 041892 P 12
AND THE ABSORPTION OF TRITIUM-LABELED WATER IN THE SMALL INTESTINE OF RATS*OF DRUGS ON INTESTINAL CIRCULATION 041886 P 11
#LABELING OF DNA ANC CELL DIVISION IN SO CALLED NON-DIVIDING TISSUES* 064744 P 35
#TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST* 028688 P 3
WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE* #CONTRIBUTION OF TRITIATED 027023 P 2
#CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE* 027023 P 2
OF TRITIATED THYMIDINE IN ANIMALS AS SHCWN BY WATER- SOLUBLE AUTORADIOGRAPHY* #DISTRIBUTION 040669 P 4
POTENTIALS IN NORMAL AND #TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND 064759 P 40
SOME CHROMOSOME STUDIES WITH TRITIATED THYMIDINE* 040673 P 5
LIVER (T2297)* # SOME EFFECTS OF TRITIATED THYMIDINE AS A DNA LABEL IN RAT 064755 P 39
DEVELOPMENT* # SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL 049533 P 23
IRRADIATION IN UTERO WITH TRITIATED WATER* # SOME EFFECTS CN MAMMALIAN DEVELOPMENT OF CONTINUOUS 065122 P 47
#PROGRESS REPORT ON USE OF TRITIATED THYMIDINE AS INTERNAL SOURCE OF RADIATION IN STUDY OF LATERAL ROOT INITIATION, 040782 P 8
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 31
#RADIATION EFFECTS OF CARBON-14 AND TRITIUM CN GROWTH OF SOYBEANS.* 054625 P 28
OF THE #ESTIMATION OF TOTAL BCDY WATER (VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, RABBIT, GUINEA PIG, AND MAN, AND 049222 P 22
#THE KINETICS OF BIOLOGICAL PROCESSES. SPECIAL PROBLEMS CONNECTED WITH THE USE OF TRACERS.* 052980 P 28
TISSUES OF YOUNG AND OLD MICE (T2675)* #EFFECT OF SPECIFIC ACTIVITY CF H3-CYTIDINE ON ITS INCORP INTO 064752 P 38
UNDER CONDITIONS OF PROLONGED ADMINISTRATION (T7590)* # SPECIFICITY OF TRITIATED THYMIDINE AS A PRECURSOR OF DNA 064762 P 41
ELECTROPHORESIS* #LIQUID SCINTILLATION SPECTROMETRY CF TRITIUM-LABELED PROTEINS SEPARATED BY DISC 040792 P 10
#THE MUTAGENIC EFFECT OF TRITIATED URIDINE IN DROSOPHILA SPERMATOCYTES* 040780 P 8
#EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (T2297)* 064741 P 35
#THE FATE OF ISOTOPE-LABELLED UTERINE SPERMATOZOA IN THE MOUSE POSTCOITUM* 041894 P 13
TRITIATED WATER ON THE EMBRYONIC DEVELOPMENT OF THE THREE- SPINE STICKLEBACK* #EFFECTS OF 069507 P 52
BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE 054897 P 28
ESTIMATICN OF BIOLOGICAL HALF-#EFFECTS OF TRITIUM Y-90, AND SR-90 + Y-90 ON THE LARVAE OF THE PACIFIC OYSTER, 048349 P 22
REVEALED BY X-RAY BREAKAGE AND 3H-THYMIDINE LABELING* #THE STAGE OF CHROMOSOME DUPLICATION IN THE CELL CYCLE AS 040667 P 4
WITH TRITIUM AS TRACER. 5. PREDOMINANTLY NON-DYNAMIC STATE CF BODY CONSTITUENTS IN RAT (T7735)* TURNOVER 067124 P 50
T4647)* #EFFECT OF AGE, SEX, HORMONAL STATE CN TRITIATED THYMIDINE UPTAKE BY RAT PITUITARY (064751 P 37
TRITIUM IN PINE TREES FROM SELECTED LOCATIONS IN THE UNITED STATES, INCLUDING AREAS NEAR NUCLEAR FACILITIES* # 073994 P 53
CF TRITIATED WATER INTC ROOTS AS INFLUENCED BY WATER STATUS OF TISSUE.* #DIFFUSION 051313 P 26
WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS* AND TRANSPORT OF RADIONCHLORIDE AND TRITIATED 043086 P 15
WATER BY VARIOUS ZONES OF ONION ROCTS OF DIFFERENT CHLORIDE STATUS.* AND TRANSPORT OF RADIOCHLORIDE AND TRITIATED 051309 P 26
WATER ON THE EMBRYONIC DEVELOPMENT OF THE THREE-SPINE STICKLEBACK* #EFFECTS OF TRITIATED 069507 P 52
ISOLATED FROM SALIVARY GLANDS OF DROSOPHILA HYDEI* # STRUCTURAL AND FUNCTIONAL PROPERTIES OF POLYTENE NUCLEI 041893 P 12
ACROSS THE GUT* #ANESTHETIC GASES AND WATER STRUCTURE. THE EFFECT CF XENON ON TRITIATED WATER FLUX 042765 P 14
IN NORMAL AND CONTINUOUSLY IRRADIATED RAT BONE MARROW STUDIED BY REPEATED LABELLING WITH TRITIATED THYMIDINE.* 054728 P 28
#WATER EXCHANGE AND BARRIERS AS STUDIED BY THE USE OF HYDROGEN ISOTOPES* 044225 P 21
#3H-2-GLUCOSE AS TRACER IN TURNOVER STUDIES (T7591)* 064763 P 41
TRACT OF MAN* #IN VITRO AUTORADIOGRAPHIC STUDIES OF CELL PROLIFERATION IN THE GASTROINTESTINAL 040670 P 5
GROSS STUDIES ON THE MOUSE* # STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. 043591 P 20
III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.* # STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. 051582 P 27
GROSS STUDIES ON THE MOUSE* # STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. I. 049604 P 24
PREDOMINANTLY NON-DYNAMIC STATE OF BODY CONSTITUENTS IN # STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS TRACER. 5. 067124 P 50
#RADIOECOLOGICAL STUDIES OF THE ENVIRONMENT OF THE EUREX NUCLEAR PLANT* 075309 P 54
PACIFIC PROVING GROUND* #PRELIMINARY STUDIES OF THE PERSISTENCE OF TRITIUM AND 14C IN THE 040781 P 8
#RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST* 056628 P 29
TISSUES AND ON ITS RADIATION EFFECTS (T2297)* # STUDIES ON INCORP CF TRITIATED THYMIDINE IN DNA OF MOUSE 064758 P 40
SEDAN CRATER* # STUDIES ON LIVER DNA IN TRITIATED KANGAROO RAT LIVING AT 040664 P 3
SEDAN CRATER* # STUDIES ON LIVER DNA IN TRITIATED KANGAROO RATS LIVING AT 064770 P 43
#USE OF TRITIUM-LABELFD THYMIDINE IN STUDIES ON SYNTHESIS OF DNA* 064760 P 40
OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. I. GROSS STUDIES ON THE MOUSE* #STUDIES 049604 P 24
OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. GROSS STUDIES ON THE MOUSE* #STUDIES 043591 P 20
#ISOTOPE STUDIES ON THE PHYSIOLCGY OF DOMESTIC ANIMALS (HPIS/133)* 077006 P 55

TRITIATED WATER. II. CRITICAL STUDY OF TECHNIQUES FOR # STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH 042767 P 14
TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF # STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH 042769 P 14
#SOME CHROMOSOME STUDIES WITH TRITIATED THYMIDINE* 040673 P 5
TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.* #STUDIES OF METABOLIC 051582 P 27
RADIATION UPON LARVAE OF A PACIFIC OYSTER* #COLUMBIA RIVER STUDIES 1969-1970, APPENDIX, EFFECTS OF TEMPERATURE AND 018273 P 1
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 17
#APPLIED AQUATIC STUDIES* 079184 P 56
#BIOLOGICAL STUDY OF A TRITIATED LUMINOUS PAINT* 043104 P 16
TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND 064759 P 40
#CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE 052834 P 28
OF TRITIATED THYMIDINE AS INTERNAL SOURCE OF RADIATION IN STUDY OF LATERAL ROOT INITIATION, 1965-1966* REPORT ON USE 040782 P 8
OF REVERTANTS OF TWO LOCI IN E. COLI WWU - A STUDY OF RADIATION ACTION ON THE GENE*THE CHARACTERIZATION 040682 P 7
OF WATER IN LEAVES WITH TRITIATED WATER. II. CRITICAL STUDY OF TECHNIQUES FOR ANALYSIS AND MEASUREMENT OF 042767 P 14
COMPARISON OF THE PERMEABILITY OF THE SKIN TO DEUTERATED #A STUDY OF THE MECHANISM OF WATER ACROSS FROG SKIN BY A 041892 P 12
DROSOPHILA AND THE HONEY BEE* #A QUANTITATIVE STUDY OF THE MUTAGENIC EFFECT OF TRANSMUTATION IN 040680 P 6
WITH TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN 042769 P 14
#TOXICITY OF TRITIUM OXIDE IN MICE AND RATS SUBJECTED TO INTRAPERITONEAL INJECTION* 040678 P 6
#ESTIMATION OF WATER CONTENT BY TRITIUM DILUTION OF ANIMALS SUBJECTED TO RAPID LIVE-WEIGHT CHANGES* 042852 P 15
#THYMIDINE METABOLISM AND H3 THYMIDINE SUICIDE IN MAMMALIAN CELLS* 041574 P 11
WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE* #CONTRIBUTION OF TRITIATED 027023 P 2
AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED LITERATURE SURVEY* #TRITIUM 075246 P 54
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 29
EFFECTS ON DAN, RNA, AND PROTEIN SYNTHETIC RATES IN SYNCHRONIZED L-CELLS* #TRITIATED THYMIDINE 040671 P 5
T7599)* #FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (064769 P 43
OF TUMOURS. DETERMINATION OF THE CELL-CYCLE AND TIME OF SYNTHESIS OF DEOXYRIBONUCLEIC ACID USING TRITIATED 054673 P 28
#USE OF TRITIUM-LABELED THYMIDINE IN STUDIES ON SYNTHESIS OF DNA* 064760 P 40
GROWING AT LOW RATES* #EVIDENCE AGAINST THE ALTERNATION OF SYNTHESIS OF IDENTICAL CHROMOSOMES IN ESCHERICHIA COLI 040666 P 4
#PHYSICS OF CELLULAR SYNTHESIS, GROWTH, AND DIVISION* 040679 P 6
#TRITIATED THYMIDINE EFFECTS ON DAN, RNA, AND PROTEIN SYNTHETIC RATES IN SYNCHRONIZED L-CELLS* 040671 P 5
VEGETATION WITH MICROMETEOROLOGICAL VARIABLES* #A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN 069396 P 51
TRANSPORTATION* #MOVEMENT OF TRITIATED WATER IN THE ROOT SYSTEM OF HELIANTHUS ANNUUS IN THE PRESENCE AND ABSENCE OF 043304 P 19
RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.* RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA- 051314 P 26
#TRITIUM EXCHANGE IN BIOLOGICAL SYSTEMS* 043103 P 16
#KINETICS OF TRITIUM IN BIOLOGICAL SYSTEMS* 077200 P 55
#MOVEMENT OF TRITIUM IN ECOLOGICAL SYSTEMS* 069508 P 52

WATER IN LEAVES WITH TRITIATED WATER. II. CRITICAL STUDY OF TECHNIQUES FOR ANALYSIS AND MEASUREMENT OF RADIOACTIVITY 042767 P 14
#COLUMBIA RIVER STUDIES 1969-1970, APPENDIX, EFFECTS OF TEMPERATURE AND RADIATION UPON LARVAE OF A PACIFIC OYSTER* 018273 P 1
#EFFECT OF SEASON AND TEMPERATURE ON PERCUTANEOUS ABSORPTION OF TRITIUM OXIDE* 049607 P 24
CRASSOSTREA GIGAS* #EFFECTS OF IONIZING RADIATION AND TEMPERATURE ON THE LARVAE OF THE PACIFIC OYSTER, 066269 P 48
IRRADIATION ON EMBRYOGENESIS OF FISH AND FIXATION AND LONG- TERM ACCUMULATION OF TRITIUM IN AN EXPERIMENTAL AQUATIC 065088 P 46
#LONG- TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM* 064779 P 45
#TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL ENVIRONMENT TO ANIMALS AND MAN* 068619 P 51
BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.* RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM 051314 P 26
#TRITIUM UPTAKE FOLLOWING A THERMONUCLEAR TEST* 045087 P 22
ITS INCORPORATION INTO A CYTOPLASMIC COMPONENT OF THE ADULT TESTIS OF DROSOPHILA MELANOGASTER* AND EVIDENCE FOR 040789 P 10
#TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS* 040785 P 9
BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS* BETWEEN THE 047898 P 22
#TRITIUM UPTAKE FOLLOWING A THERMONUCLEAR TEST* 045087 P 22
#USE OF TRITIATED WATER (THO) FOR CONTINUOUS REGISTRATION OF INSECT TRANSPIRATION* 043105 P 17
#CYTOLOGICAL EFFECTS OF TRITIATED WATER (THO) ON ROOT-TIP MERISTEMS OF ALLIUM CEPA L* 043274 P 18
OF TRANSLOCATION IN THE PHLOEM OF THE BEAN PLANT USING THO, P-32, AND C-14.* #AN ANALYSIS 051223 P 26
OF TRITIATED WATER ON THE EMBRYONIC DEVELOPMENT OF THE THREE-SPINE STICKLEBACK* #EFFECTS 069507 P 52
DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31, 1972* OF RADIOACTIVE MATERIALS IN WASTE 082903 P 58
EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE BIOLOGICAL 054897 P 28
#INTRANUCLEAR IRRADIATION WITH TRITIUM-LABELED THYMIDINE (T2241)* 064739 P 34
#TUMOR INDUCTION IN MICE BY RADIOACTIVE THYMIDINE (T3356)* 064735 P 33
#DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)* 064753 P 38
PROTECTION ASPECTS* #INTRANUCLEAR H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION 049714 P 25
PROTECTION ASPECTS* #INTRANUCLEAR 3H THYMIDINE - DOSIMETRIC, RADIOLOGICAL AND RADIATION 040776 P 7
GROWTH RATES AND POTENTIALS IN NORMAL AND #TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF 064759 P 40
TIME OF SYNTHESIS OF DEOXYRIBONUCLEIC ACID USING TRITIATED THYMIDINE AND AUTORADIOGRAPHY.* OF THE CELL-CYCLE AND 054673 P 28
CYTOPLASMIC COMPONENT OF THE #GENETIC EFFECTS OF TRITIATED THYMIDINE AND EVIDENCE FOR ITS INCORPORATION INTO A 040789 P 10
ADULT DROSOPHILA MELANOGASTER #THE EFFECT OF TRITIATED THYMIDINE AND GAMMA IRRADIATION ON THE MORTALITY OF THE 040793 P 8
#TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS* 040785 P 9
#TRITIATED THYMIDINE AS A CYTOCIDAL AGENT IN HUMAN LEUKEMIA* 040675 P 6
#EFFECTS OF H3- THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* 064771 P 43
#SOME EFFECTS OF TRITIATED THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* 064755 P 39
PROLONGED ADMINISTRATION (T7590)* #SPECIFICITY OF TRITIATED THYMIDINE AS A PRECURSOR OF DNA UNDER CONDITIONS OF 064762 P 41
LATERAL ROOT #PROGRESS REPORT ON USE OF TRITIATED THYMIDINE AS INTERNAL SOURCE OF RADIATION IN STUDY OF 040782 P 8
#UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.* 051947 P 27
#RADIATION DOSES RESULTING FROM THE INGESTION OF TRITIATED THYMIDINE BY THE RAT* 049587 P 23
#3H THYMIDINE CORPORATION INTO NUCLEAR DNA OF LEAF CELLS* 041888 P 11
IN SYNCHRONIZED L-CELLS* #TRITIATED THYMIDINE EFFECTS ON DAN, RNA, AND PROTEIN SYNTHETIC RATES 040671 P 5
AUTORADIOGRAPHY* #DISTRIBUTION OF TRITIATED THYMIDINE IN ANIMALS AS SHOWN BY WATER-SOLUBLE 040669 P 4
#DELAY AFTER PLUCKING OF HAIRS BETWEEN THE APPEARANCE OF H3- THYMIDINE IN CELLS AND ITS INCORP INTO DNA (T1858A)* 064750 P 37
EFFECTS (T2297)* #STUDIES ON INCORP OF TRITIATED THYMIDINE IN DNA OF MOUSE TISSUES AND ON ITS RADIATION 064758 P 40
#METABOLISM AND FATE OF TRITIATED THYMIDINE IN MAN (T7585)* 064747 P 36
#USE OF TRITIUM-LABELED THYMIDINE IN STUDIES ON SYNTHESIS OF DNA* 064760 P 40
#UPTAKE OF TRITATED THYMIDINE IN THE ROOT TIP MERISTEM OF VICIA FABA (L)* 040791 P 10
#TURNOVER OF TRITIUM FROM THYMIDINE IN TISSUES OF RAT (T0073)* 064756 P 39
EFFECTS (T1252)* #FOUR-FACTOR MODEL ANALYSIS OF THYMIDINE INCORP INTO MOUSE DNA AND MECHANISM OF RADIATION 064745 P 35
HUMAN FIBROBLASTS* #CHROMATIC ABERATIONS RESULTING FROM 3H- THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN 041900 P 13
#INCORPORATION OF TRITIATED THYMIDINE INTO DEOXYRIBONUCLEIC ACID BY ISOLATED NUCLEI.* 051975 P 27
#INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (T2243)* 064748 P 36

#INCCRPORATION OF THYMIDINE INTO DNA OF MOUSE ORGANS (T0031)* 064738 P 34
#INCCRPORATION OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE (T2297)* 064726 P 32
#INCORPORATION OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE* 040775 P 7
DEATH OF MAMMALIAN CELLS DUE TO BETA-RADIATION FROM INCORPD THYMIDINE LABELED WITH H-3 OR C-14 (T2333)* #REPRODUCTIVE 064746 P 36
IN THE CELL CYCLE AS REVEALED BY X-RAY BREAKAGE AND 3H- THYMIDINE LABELING* #THE STAGE OF CHROMOSOME DUPLICATION 040667 P 4
DEGRADATION* # THYMIDINE METABOLISM - PATHWAYS OF INCORPORATION AND 064764 P 42
AND GROWTH INHIBITION (T7597)* # THYMIDINE METABOLISM - THE FOUR-FACTOR MODEL, POOL SIZES 064765 P 42
CELLS* # THYMIDINE METABOLISM AND H3 THYMIDINE SUICIDE IN MAMMALIAN 041574 P 11
#EFFECT CF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (T2297)* 064741 P 35
#DELETERIOUS INFLUENCE OF ORALLY ADMINISTERED TRITIATED THYMIDINE ON REPRODUCTIVE CAPACITY OF MICE (T2297)* 064757 P 39
* #EFFECT CF TRITIATED THYMIDINE ON SISTER-CHROMATID EXCHANGE IN A RING CHROMOSOME 040681 P 6
#ACTION CF TRITIATED THYMIDINE ON THE CLONAL GROWTH OF MAMMALIAN CELLS.* 052180 P 27
EXCHANGES FOLLOWING EXPOSURE TO VARYING DOSES OF H-3 - THYMIDINE OR X-RAYS* #THE FREQUENCY OF SISTER CHROMATID 043155 P 18
#THYMIDINE METABOLISM AND H3 THYMIDINE SUICIDE IN MAMMALIAN CELLS* 041574 P 11
#EFFECT OF AGE, SEX, HORMONAL STATE ON TRITIATED THYMIDINE UPTAKE BY RAT PITUITARY (T4647)* 064751 P 37
#TOXICITY CF TRITIUM-LABELED THYMIDINE* 040786 P 9
#SOME CHROMOSOME STUDIES WITH TRITIATED THYMIDINE* 040673 P 5
OF LEUKEMIA IN THE C57 BL MOUSE BY MEANS CF TRITIATED THYMIDINE* #INDUCTION 040778 P 7
ESTIMATE OF THE HAZARD FROM INGESTION CF TRITIATED THYMIDINE* #PRELIMINARY 058835 P 30
INCUCED IN CHINESE HAMSTER CELLS BY TRITIUM-LABELED THYMIDINE* #THE KINETICS OF CHROMATID ABERRATIONS 040790 P 10
#MUTATIONS INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.* 051968 P 27
BONE MARROW STUDIED BY REPEATED LABELLING WITH TRITIATED THYMIDINE.* IN NORMAL AND CONTINUOUSLY IRRADIATED RAT 054728 P 28
DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED THYMIDINE.* THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL 052834 P 28
INDUCING CHRCMOSCMAL ABERRATIONS (#COMPARISCNS CF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN 064772 P 43
COVERSLIP MONOLAYER TISSUE CULTURES LABELED WITH TRITIATED THYMYDINE* #RADIOAUTOGRAPHIC PROCESSING SEQUENCE FOR 041890 P 12
OF TUMOURS. DETERMINATION OF THE CELL-CYCLE AND TIME OF SYNTHESIS OF DEOXYRIBONUCLEIC ACID USING TRITIATED 054673 P 28
#UPTAKE OF TRITATED THYMIDINE IN THE ROOT TIP MERISTEM OF VICIA FABA (L)* 040791 P 10
#CYTOLOGICAL EFFECTS OF TRITIATED WATER (THO) ON ROOT- TIP MERISTEMS OF ALLIUP CEPA L* 043274 P 18
PROCESSING SEQUENCE FOR CCVERSLIP MONOLAYER TISSUE CULTURES LABELED WITH TRITIATED THYMYDINE* 041890 P 12
TO RABBITS* # TISSUE DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE 067165 P 51
#TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS* 043246 P 18
#FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)* 064769 P 43
OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (T2297)* AND USE IN STUDY 064759 P 40
OF INTESTINAL ABSORPTION, LYMPH AND PLASMA TRANSPORT, AND TISSUE UPTAKE OF ALPHA- AND GAMMA-TOCOPHEROLS IN RAT (067133 P 50
TRITIATED WATER INTO ROOTS AS INFLUENCED BY WATER STATUS OF TISSUE.* #DIFFUSION OF 051313 P 26
TO THE RAT* #ESTIMATION OF RADIATION DOSES TO TISSUES AFTER ADMINISTRATION OF TRITIATED CORTICOSTEROIDS 049588 P 23
#STUDIES ON INCORP OF TRITIATED THYMIDINE IN DNA OF MOUSE TISSUES AND ON ITS RADIATION EFFECTS (T2297)* 064758 P 40
#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 33
#TURNOVER OF TRITIUM FRCM THYMIDINE IN TISSUES OF RAT (T0073)* 064756 P 39
OF SPECIFIC ACTIVITY OF H3-CYTIDINE ON ITS INCORP INTO TISSUES OF YOUNG AND OLD MICE (T2675)* #EFFECT 064752 P 38
LABELING OF DNA AND CELL DIVISION IN SO CALLED NON-DIVIDING TISSUES* # 064744 P 35
OF DIETARY FAT ON THE INCORPORATION OF T2O IN AVIAN TISSUES* #THE INFLUENCE 043101 P 16
AND PLASMA TRANSPORT, AND TISSUE UPTAKE OF ALPHA- AND GAMMA- TOCOPHEROLS IN RAT (T2788)*OF INTESTINAL ABSORPTION, LYMPH 067133 P 50
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 17
RABBIT, GUINEA PIG, AND MAN, AND OF THE #ESTIMATION OF TOTAL BODY WATER (VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, 049222 P 22
TRITIATED WATER* # TOTAL BODY WATER ESTIMATIONS IN DAIRY CATTLE USING 043358 P 19
#DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE* 056179 P 29
IN NORMAL AND #TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS 064759 P 40
INTRAPERITONEAL INJECTION* # TOXICITY OF TRITIUM OXIDE IN MICE AND RATS SUBJECTED TO 040678 P 6
THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS* # TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN 040785 P 9
TOXICITY OF TRITIUM-LABELED THYMIDINE* 040786 P 9
TOXICITY OF TRITIUM-LABELED WATER* 040788 P 9
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (T0226)* 064727 P 32
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (T0226)* 064728 P 32
#3H-2-GLUCOSE AS TRACER IN TURNOVER STUDIES (T7591)* 064763 P 41
#STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. GROSS STUDIES ON THE MOUSE* 043591 P 20
#STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. I. GROSS STUDIES ON THE MOUSE* 049604 P 24
DEUTERIUM.*#STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND 051582 P 27
CONSTITUENTS #STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS TRACER. 5. PREDOMINANTLY NON-DYNAMIC STATE OF BODY 067124 P 50
#HAZARDS FROM ISOTOPIC TRACERS (T2297)* 064749 P 37
PROCESSES. SPECIAL PROBLEMS CONNECTED WITH THE USE OF TRACERS.* #THE KINETICS OF BIOLOGICAL 052980 P 28
STUDIES OF CELL PROLIFERATION IN THE GASTROINTESTINAL TRACT OF MAN* #IN VITRO AUTORADIOGRAPHIC 040670 P 5
ANIMAL RESEARCH* #LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN 016938 P 1
UNDER NATURAL CONDITIONS* # TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK 065163 P 47
HERBE ET DU LAIT, EN CONDITIONS NATURELLES* # TRANSFER ET INCORP DU TRITIUM DANS LES CONSTITUANTS DE L 064781 P 45
#TRITIUM INCORPORATION IN ALGAE AND TRANSFER IN SIMPLE AQUATIC FOOD CHAINS* 061100 P 30
ENVIRONMENT TO ANIMALS AND MAN* # TRANSFER OF RADIOACTIVE MATERIALS FROM THE TERRESTRIAL 068619 P 51
PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN # TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND 049639 P 24
PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN # TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND 043364 P 19
TISSUE IN PATIENTS FCLLOWING BURNS* # TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATICN 043246 P 18
#DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* 070396 P 52
DOMESTIC COOKING* #TRITIUM TRANSFER TO FOOD ITEMS FROM TRITIATED METHANE USED FOR 078468 P 56
#TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN* 074536 P 53
II. CRITICAL STUDY OF TECHNIQUES FOR #STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. 042767 P 14
INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE #STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. 042769 P 14
#INACTIVATION OF TRANSFORMING DNA BY TRITIUM DISINTEGRATIONS IN VIVO* 041901 P 13
32, AND C-14.* #AN ANALYSIS OF TRANSLOCATION IN THE PHLOEM OF THE BEAN PLANT USING THO, P- 051223 P 26
TRANSMUTATION EFFECT* 040787 P 9
#A QUANTITATIVE STUDY OF THE MUTAGENIC EFFECT OF TRANSMUTATION IN DROSOPHILA AND THE HONEY BEE* 040680 P 6
TRITIATED WATER (THO) FOR CONTINUOUS REGISTRATION OF INSECT TRANSPIRATION* #USE OF 043105 P 17
#A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL VARIABLES* 069396 P 51
ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE #UPTAKE AND TRANSPORT OF RADIOCHLORIDE AND TRITIATED WATER BY VARIOUS 051309 P 26
ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE #UPTAKE AND TRANSPORT OF RADIONCHLORIDE AND TRITIATED WATER BY VARIOUS 043086 P 15
#COMPARISCN OF INTESTINAL ABSORPTION, LYMPH AND PLASMA TRANSPORT, AND TISSUE UPTAKE OF ALPHA- AND GAMMA- 067133 P 50
SYSTEM OF HELIANTHUS ANNUUS IN THE PRESENCE ANC ABSENCE OF TRANSPORTATION* #MOVEMENT OF TRITIATED WATER IN THE ROOT 043304 P 19
UPTAKE HALF-LIVES AND RADIATION DOSES CF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL 049600 P 23
#TRITIUM ANC CARBCN-14 IN THE TREE RINGS* 043106 P 17
INCLUDING AREAS NEAR NUCLEAR FACILITIES* #TRITIUM IN PINE TREES FROM SELECTED LOCATIONS IN THE UNITED STATES, 073994 P 53

L)* #UPTAKE OF
OF RADIATION DOSES TO TISSUES AFTER ADMINISTRATION OF
ECOLOGY AND RADIATION EXPOSURE OF KANGAROO RATS LIVING IN A
#RADIATION DOSES RESULTING FROM ADMINISTRATION OF
#STUDIES ON LIVER DNA IN
#STUDIES ON LIVER DNA IN
FOR ANALYSIS AND MEASUREMENT OF RADIOACTIVITY OF WATER AND
IN RATS #COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A
#INVESTIGATION OF
#BIOLOGICAL STUDY OF A
#TRITIUM TRANSFER TO FOOD ITEMS FROM
#RADIOAUTOGRAPHY OF
#DOSE TO THE CELL NUCLEUS FROM
CYCLE AND TIME OF SYNTHESIS OF DEOXYRIBONUCLEIC ACID USING
INTO A CYTOPLASMIC COMPONENT OF THE #GENETIC EFFECTS OF
OF THE ADULT DROSOPHILA MELANOGASTER LARVAE (#THE EFFECT OF
#
#SOME EFFECTS OF
OF PROLONGED ADMINISTRATION (T7590)* #SPECIFICITY OF
STUDY OF LATERAL ROOT #PROGRESS REPORT ON USE OF
#UPTAKE OF
#RADIATION DOSES RESULTING FROM THE INGESTION OF
SYNYHETIC RATES IN SYNCHRONIZED L-CELLS* #
AUTORADIOGRAPHY* #DISTRIBUTION OF
RADIATION EFFECTS (T2297)* #STUDIES ON INCORP OF
#METABOLISM AND FATE OF
NUCLEI.* #INCORPORATION OF
T2243)* #INCORPORATION OF
#EFFECT OF
T2297)* #DELETERIOUS INFLUENCE OF ORALLY ADMINISTERED
CHROMOSOME* #EFFECT OF
CELLS.* #ACTION OF
#EFFECT OF AGE, SEX, HORMONAL STATE ON
#MUTATIONS INDUCED IN THE MOUSE WITH
OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING
RAT BONE MARROW STUDIED BY REPEATED LABELLING WITH
#PRELIMINARY ESTIMATE OF THE HAZARD FROM INGESTION OF
#SOME CHROMOSOME STUDIES WITH
#INDUCTION OF LEUKEMIA IN THE C57 BL MOUSE BY MEANS OF
RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (#COMPARISONS OF
FOR COVERSLIP MONOLAYER TISSUE CULTURES LABELED WITH
#THE MUTAGENIC EFFECT OF
#TRITIATION OF ANIMALS FROM
INSECT TRANSPIRATION* #USE OF
L* #CYTOLOGICAL EFFECTS OF
#LABELING OF PROTEINS BY IRRADIATION IN
#FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN
#TRITIATION OF ANIMALS FROM
CHROMOSOMAL #COMPARISONS OF TRITIATED THYMIDINE,
#
AT THE SOIL SURFACE* #CONTRIBUTION OF
#COMPARATIVE METABOLISM OF
DIFFERENT #UPTAKE AND TRANSPORT OF RADIOCHLORIDE AND
DIFFERENT #UPTAKE AND TRANSPORT OF RADIONCHLORIDE AND
GASES AND WATER STRUCTURE. THE EFFECT OF XENON ON
#THE INFLUENCE OF 5-HYDROXYTRYPTAMINE ON THE ABSORPTION OF
#MOVEMENT AND DISTRIBUTION OF
HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF
UNDER TROPICAL CONDITIONS AND #THE BIOLOGICAL HALF-LIFE OF
RESULTING FROM ADMINISTRATION OF TRITIATED FOLIC ACID AND
CLIMATE AND SALINE DRINKING ON THE BIOLOGICAL HALF-LIFE OF
THE PRESENCE AND ABSENCE OF TRANSPORTATION* #MOVEMENT OF
ACIDS (T2297)* #INCORPORATION OF TRITIUM FROM
OF TISSUE.* #DIFFUSION OF
#SOME EFFECTS OF
#THE EFFECTS OF CHRONIC IRRADIATION BY
SPINE STICKLEBACK* #EFFECTS OF
TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO
THE #STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH
#STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH
#TOTAL BODY WATER ESTIMATIONS IN DAIRY CATTLE USING
#HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF
ACID LABELING DURING PHOTOSYNTHESIS WITH C(14)O2 AND
DEVELOPMENT OF CONTINUOUS IRRADIATION IN UTERO WITH
AFTER ADMINISTRATION OF ORGANICALLY BOUND TRITIUM AND OF
OF THE PERMEABILITY OF THE SKIN TO DEUTERATED AND
LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH
#
#
FRESHWATER POOL* #
POOL* #
I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND
ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF
MICROCOSMS* #
#
WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH
LITERATURE SURVEY* #
INTO COW'S MILK AFTER ADMINISTRATION OF ORGANICALLY BOUND

TRITIATED THYMIDINE IN THE ROOT TIP MERISTEM OF VICIA FABA (040791 P 10
TRITIATED CORTICOSTEROIDS TO THE RAT* #ESTIMATION 049588 P 23
TRITIATED ENVIRONMENT* # 060607 P 30
TRITIATED FOLIC ACID AND TRITIATED WATER IN THE RAT* 062623 P 31
TRITIATED KANGAROO RAT LIVING AT SEDÁN CRATER* 040664 P 3
TRITIATED KANGAROO RATS LIVING AT SEDAN CRATER* 064770 P 43
TRITIATED LEAF METABOLITES.* CRITICAL STUDY OF TECHNIQUES 042767 P 14
TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER 047898 P 22
TRITIATED LUMINOUS COMPOUNDS* 065935 P 47
TRITIATED LUMINOUS PAINT* 043104 P 16
TRITIATED METHANE USED FOR DOMESTIC COOKING* 078468 P 56
TRITIATED PHOTOSYNTHATE ARISING FROM HTO.* 051225 P 26
TRITIATED THYMIDINE (T7595)* 064753 P 38
TRITIATED THYMIDINE AND AUTORADIOGRAPHY.* OF THE CELL- 054673 P 28
TRITIATED THYMIDINE AND EVIDENCE FOR ITS INCORPORATION 040789 P 10
TRITIATED THYMIDINE AND GAMMA IRRADIATION ON THE MORTALITY 040783 P 8
TRITIATED THYMIDINE AS A CYTOCIDAL AGENT IN HUMAN LEUKEMIA* 040675 P 6
TRITIATED THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* 064755 P 39
TRITIATED THYMIDINE AS A PRECURSOR OF DNA UNDER CONDITIONS 064762 P 41
TRITIATED THYMIDINE AS INTERNAL SOURCE OF RADIATION IN 040782 P 8
TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.* 051967 P 27
TRITIATED THYMIDINE BY THE RAT* 049587 P 23
TRITIATED THYMIDINE EFFECTS ON DAN, RNA, AND PROTEIN 040671 P 5
TRITIATED THYMIDINE IN ANIMALS AS SHOWN BY WATER-SOLUBLE 040669 P 4
TRITIATED THYMIDINE IN DNA OF MOUSE TISSUES AND ON ITS 064758 P 40
TRITIATED THYMIDINE IN MAN (T7585)* 064747 P 36
TRITIATED THYMIDINE INTO DEOXYRIBONUCLEIC ACID BY ISOLATED 051975 P 27
TRITIATED THYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (064748 P 36
TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (T2297)* 064741 P 35
TRITIATED THYMIDINE ON REPRODUCTIVE CAPACITY OF MICE (064757 P 39
TRITIATED THYMIDINE ON SISTER-CHROMATID EXCHANGE IN A RING 040681 P 6
TRITIATED THYMIDINE ON THE CLONAL GROWTH OF MAMMALIAN 052180 P 27
TRITIATED THYMIDINE UPTAKE BY RAT PITUITARY (T4647)* 064751 P 37
TRITIATED THYMIDINE.* 051968 P 27
TRITIATED THYMIDINE.* THE RAT AT HIGH DOSE RATES. A STUDY 052834 P 28
TRITIATED THYMIDINE.*IN NORMAL AND CONTINUOUSLY IRRADIATED 054728 P 28
TRITIATED THYMIDINE* 058835 P 30
TRITIATED THYMIDINE* 040673 P 5
TRITIATED THYMIDINE* 040778 P 7
TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA 064772 P 43
TRITIATED THYMYDINE* #RADIOAUTOGRAPHIC PROCESSING SEQUENCE 041890 P 12
TRITIATED URIDINE IN DROSOPHILA SPERMATOCYTES* 040780 P 8
TRITIATED WATER (CONTD) (T7734)* 067123 P 49
TRITIATED WATER (THO) FOR CONTINUOUS REGISTRATION OF 043105 P 17
TRITIATED WATER (THO) ON ROOT-TIP MERISTEMS OF ALLIUM CEPA 043274 P 18
TRITIATED WATER (T26178)* 067143 P 50
TRITIATED WATER (T7599)* 064769 P 43
TRITIATED WATER (T7734)* 067122 P 49
TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING 064772 P 43
TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 17
TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION 027023 P 7
TRITIATED WATER BY MAMMALS* 043593 P 20
TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF 051309 P 26
TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF 043086 P 15
TRITIATED WATER FLUX ACROSS THE GUT* #ANESTHETIC 042765 P 14
TRITIATED WATER FROM THE INTESTINE OF THE RAT* 043152 P 17
TRITIATED WATER IN PLANTS.* 051226 P 26
TRITIATED WATER IN RATS AND CATS* BETWEEN THE BIOLOGICAL 047898 P 22
TRITIATED WATER IN THE MOUSE, RAT, GUINEA-PIG AND RABBIT 043182 P 18
TRITIATED WATER IN THE RAT* #RADIATION DOSES 062623 P 31
TRITIATED WATER IN THE RAT* CONDITIONS AND THE EFFECT OF 043182 P 18
TRITIATED WATER IN THE ROOT SYSTEM OF HELIANTHUS ANNUUS IN 043304 P 19
TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC 064766 P 42
TRITIATED WATER INTO ROOTS AS INFLUENCED BY WATER STATUS 051313 P 26
TRITIATED WATER ON MAMMALIAN FETAL DEVELOPMENT* 049533 P 23
TRITIATED WATER ON POECILIA RETICULATE, THE GUPPY* 026846 P 2
TRITIATED WATER ON THE EMBRYONIC DEVELOPMENT OF THE THREE- 069507 P 52
TRITIATED WATER VAPOR* #DOSE 070396 P 52
TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF 042769 P 14
TRITIATED WATER. II. CRITICAL STUDY OF TECHNIQUES FOR 042767 P 14
TRITIATED WATER* 043358 P 19
TRITIATED WATER* 061721 P 31
TRITIATED WATER* #GLYCOLIC 042770 P 14
TRITIATED WATER* #SOME EFFECTS ON MAMMALIAN 065122 P 47
TRITIATED WATER* #TRITIUM SECRETION INTO COW'S MILK 075319 P 54
TRITIATED WATER* OF WATER ACROSS FROG SKIN BY A COMPARISON 041892 P 12
TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL DIPHOSPHATE* HALF- 049600 P 23
TRITIATION OF ANIMALS FROM TRITIATED WATER (CONTD) (T7734)* 067123 P 49
TRITIATION OF ANIMALS FROM TRITIATED WATER (T7734)* 067122 P 49
TRITIATION OF AQUATIC ANIMALS IN AN EXPERIMENTAL 045046 P 21
TRITIATION OF AQUATIC ANIMALS IN AN EXPERIMENTAL MARINE 069935 P 52
TRITIUM (T1643)* (MPC)W FROM INTERSPECIES CORRELATIONS. 064773 P 44
TRITIUM (T7609)* #REVIEW OF LABORATORY 064777 P 44
TRITIUM - DISCRIMINATION AND CONCENTRATION IN FRESH WATER 067798 P 51
TRITIUM AND CARBON-14 IN THE TREE RINGS* 043106 P 17
TRITIUM AND DEUTERIUM.* #STUDIES OF METABOLIC TURNOVER 051592 P 27
TRITIUM AND ITS EFFECTS IN THE ENVIRONMENT - A SELECTED 075246 P 54
TRITIUM AND OF TRITIATED WATER* #TRITIUM SECRETION 075319 P 54

#PRELIMINARY STUDIES OF THE PERSISTENCE OF
#HAZARD OF
#STUDIES OF METABOLIC TURNOVER WITH
#STUDIES OF METABOLIC TURNOVER WITH
AND DEUTERIUM.* #STUDIES OF METABOLIC TURNOVER WITH
BODY CONSTITUENTS IN #STUDIES OF METABOLIC TURNOVER WITH
#RESIDUAL
LAKE* #
#ECOLOGICAL ASPECTS OF
LOSS IN MICE.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF
FABA) AS A TEST #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF
#RADIATION DOSE DUE TO ACUTE INTAKE OF
#THE HAZARD FROM
CONDITIONS NATURELLES* #TRANSFER ET INCORP DU
#LETHALITY AND MUTATIONS PRODUCED BY
DECEMBER 31, 1966.* #THE EFFECTS OF
#EFFECTS OF
CHANGES* #ESTIMATION OF WATER CONTENT BY
#INACTIVATION OF TRANSFORMING DNA BY
#
#NEW DOSE ESTIMATES FROM CHRONIC
#PERCUTANEOUS ABSORPTION BY RATS OF
#TURNOVER OF
#INCORPORATION OF
#INCORPORATION OF
AND NUCLEIC ACIDS (T2297)* #INCORPORATION OF
#ABSORPTION AND METABOLISM OF TRITIUM OXIDE AND
#BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF
OF FISH AND FIXATION AND LONG-TERM ACCUMULATION OF
#QUANTITATIVE EVALUATION OF
#KINETICS OF
#THE RELATIVE BIOLOGICAL EFFECTIVENESS OF
#MOVEMENT OF
#
#ACCUMULATION AND RETENTION OF
LOCAL EFFECT ACCOMPANYING THE DECAY OF INCORPORATED
#INCORPORATION OF
#PHYSIOLOGY AND TOXICOLOGY OF
#PHYSIOLOGY AND TOXICOLOGY OF
#PERMISSIBLE LEVELS OF
GUINEA PIG, AND MAN, AND OF THE BIOLOGICAL HALF-LIFE OF
UNITED STATES, INCLUDING AREAS NEAR NUCLEAR FACILITIES* #
#RADIATION DOSE FROM NON-EXCHANGEABLE
#NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND
*
AQUATIC FOOD CHAINS* #
#TRANSFER AND INCORPORATION OF
RADIOACTIVITY BY MONKEYS* #DISTRIBUTION AND EXCRETION OF
AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF
#RADIOECOLOGICAL STUDIES OF
#
#RADIATION EFFECTS OF CARBON-14 AND
#EFFECT OF BODY DISTRIB AND RETENTION OF
#ABSORPTION AND METABOLISM OF
DEVELOPMENT OF THE OFFSPRING OF RATS IN #TRANSFER OF
DEVELOPMENT OF THE OFFSPRING OF RATS IN THE #TRANSFER OF
#RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER
INTRAPERITONEAL INJECTION* #TOXICITY OF
#THE GROSS RETENTION AND METABOLISM OF
1962 - JULY 31, 1964* #THE EFFECTS OF
#THE EFFECTS OF
#EFFECT OF
#TISSUE DOSES FROM CHRONIC ADMINISTRATION OF
MICROMETEOROLOGICAL VARIABLES* #A SYSTEM FOR CORRELATING
#PERCUTANEOUS ABSORPTION OF
#
#DETERMINATION OF TOTAL BODY WATER WITH
OF SEASON AND TEMPERATURE ON PERCUTANEOUS ABSORPTION OF
DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO
OF THE RABBIT ORGANISM AFTER PROLONGED ADMINISTRATION OF
#THE
POWER PLANTS* #AEC COMMENTS ON
#THE SIGNIFICANCE OF
ORGANICALLY BOUND TRITIUM AND OF TRITIATED WATER* #
MAN, AND OF THE #ESTIMATION OF TOTAL BODY WATER (VIRTUAL
#THE 1971
FOR DOMESTIC COOKING* #
#
PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL #
PACIFIC OYSTER, ESTIMATION OF BIOLOGICAL HALF- #EFFECTS OF
#SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF
#RADIATION EFFECTS POLY-DAT FROM INTRAMOLECULAR
#
#INTERNAL CONTAMINATION WITH
#LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF
#EFFECTS OF INTRACELLULAR IRRADIATION WITH
#BETA HISTORADIOGRAPHY WITH
COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND

TRITIUM AND 14C IN THE PACIFIC PROVING GROUND* 040781 P 8
TRITIUM AS A DNA LABEL IN MAN (T1858)* 064740 P 34
TRITIUM AS A TRACER. GROSS STUDIES ON THE MOUSE* 043591 P 20
TRITIUM AS A TRACER. I. GROSS STUDIES ON THE MOUSE* 049604 P 24
TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM 051582 P 27
TRITIUM AS TRACER. 5. PREDOMINANTLY NON-DYNAMIC STATE OF 067124 P 50
TRITIUM AT SEDAN CRATER* 023154 P 2
TRITIUM BEHAVIOR IN FISH FROM A CHRONICALLY CONTAMINATED 012939 P 1
TRITIUM BEHAVIOR IN THE ENVIRONMENT* 065101 P 46
TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT 054897 P 28
TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA 051314 P 26
TRITIUM BY MAN* 071505 P 53
TRITIUM CONTAMINATION* 057579 P 30
TRITIUM DANS LES CONSTITUANTS DE L HERBE ET DU LAIT, EN 064781 P 45
TRITIUM DECAY IN BACTERIOPHAGES* 040683 P 7
TRITIUM DECAY ON DNA. PROGRESS REPORT, JUNE 1, 1966 TO 053555 P 28
TRITIUM DECAY ON DNA* 065659 P 47
TRITIUM DILUTION OF ANIMALS SUBJECTED TO RAPID LIVE-WEIGHT 042852 P 15
TRITIUM DISINTEGRATIONS IN VIVO* 041901 P 13
TRITIUM EXCHANGE IN BIOLOGICAL SYSTEMS* 043103 P 16
TRITIUM EXPOSURES* 049713 P 25
TRITIUM FROM A LUMINOUS COMPOUND* 047885 P 22
TRITIUM FROM THYMIDINE IN TISSUES OF RAT (T0073)* 064756 P 39
TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE (T2297)* 064726 P 32
TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE* 040775 P 7
TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS 064766 P 42
TRITIUM GAS BY BEAN PLANTS.* 051228 P 26
TRITIUM GAS.* 051402 P 26
TRITIUM IN AN EXPERIMENTAL AQUATIC ENVIRONMENT* 065088 P 46
TRITIUM IN AUTORADIOGRAPHY AND RADIOCHEMISTRY* 043093 P 16
TRITIUM IN BIOLOGICAL SYSTEMS* 077200 P 55
TRITIUM IN DEPRESSING IRON UPTAKE IN RATS.* 054914 P 28
TRITIUM IN ECOLOGICAL SYSTEMS* 069508 P 52
TRITIUM IN ECOLOGY. A REVIEW.* 053417 P 28
TRITIUM IN EMBRYO AND LARVAL FISH AND RADIATION EFFECT* 065955 P 48
TRITIUM IN ESCHERICHIA COLI* #EVIDENCE FOR A MUTAGENIC 040779 P 8
TRITIUM IN HAIR* 062253 P 31
TRITIUM IN MA (T0226)* 064727 P 32
TRITIUM IN MAN (T0226)* 064728 P 32
TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 49
TRITIUM IN MAN* TRITIUM SPACE) IN THE RAT, CAT, RABBIT, 049222 P 22
TRITIUM IN PINE TREES FROM SELECTED LOCATIONS IN THE 073994 P 53
TRITIUM IN RATS AFTER TRITIUM OXIDE IGENSTION* 049684 P 24
TRITIUM IN RECENT YEARS* 043102 P 16
TRITIUM IN THE BIOSPHERE AND ITS TRANSFER TO THE FOOD CHAIN 074536 P 53
TRITIUM INCORPORATION IN ALGAE AND TRANSFER IN SIMPLE 061100 P 30
TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* 065163 P 47
TRITIUM LABELED CEREBROSIDES (GALACTOSYL CERAMIDE) 056181 P 29
TRITIUM METABOLISM* AND COMPARTMENTS IN THE RAIN FOREST 021312 P 2
TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST* 056628 P 29
TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST* 028688 P 3
TRITIUM ON GROWTH OF SOYBEANS.* 054625 P 28
TRITIUM ON HAZARD OF EXPOSURE TO TRITIUM OXIDE* 064778 P 44
TRITIUM OXIDE AND TRITIUM GAS BY BEAN PLANTS.* 051228 P 26
TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF 049639 P 24
TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF 043364 P 19
TRITIUM OXIDE IGENSTION* 049684 P 24
TRITIUM OXIDE IN MICE AND RATS SUBJECTED TO 040678 P 6
TRITIUM OXIDE IN THE MOUSE.* 051748 P 27
TRITIUM OXIDE ON AQUATIC ORGANISMS. FINAL REPORT, JUNE 1, 043180 P 18
TRITIUM OXIDE ON AQUATIC ORGANISMS* 043088 P 15
TRITIUM OXIDE ON THE FERTILITY OF MALES* 042766 P 14
TRITIUM OXIDE TO RABBITS* 067165 P 51
TRITIUM OXIDE TRANSPORT IN VEGETATION WITH 069396 P 51
TRITIUM OXIDE.* 051628 P 27
TRITIUM OXIDE* 075281 P 54
TRITIUM OXIDE* 056179 P 29
TRITIUM OXIDE* #EFFECT 049607 P 24
TRITIUM OXIDE* #EFFECT OF BODY 064778 P 44
TRITIUM OXIDE* OF HEAVY HYDROGEN IN THE AQUEOUS PHASE 043365 P 19
TRITIUM RATE EFFECT IN TYROSINASE-CATALYZED HYDROXYLATION.* 051589 P 27
TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR 038641 P 3
TRITIUM RELEASES TO THE ENVIRONMENT* 037402 P 3
TRITIUM SECRETION INTO COW'S MILK AFTER ADMINISTRATION OF 075319 P 54
TRITIUM SPACE) IN THE RAT, CAT, RABBIT, GUINEA PIG, AND 049222 P 22
TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 29
TRITIUM TRANSFER TO FOOD ITEMS FROM TRITIATED METHANE USED 078468 P 56
TRITIUM UPTAKE FOLLOWING A THERMONUCLEAR TEST* 045087 P 22
TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER 049600 P 23
TRITIUM Y-90, AND SR-90 + Y-90 ON THE LARVAE OF THE 048349 P 22
TRITIUM* 013458 P 1
TRITIUM* 041895 P 13
TRITIUM* 077191 P 55
TRITIUM* 060933 P 31
TRITIUM* 064779 P 45
TRITIUM.* 053130 P 28
TRITIUM.* 051965 P 27
TRITIUM.*WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I. 051573 P 26

OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS* #TOXICITY 040785 P 9
#RADIATION DECOMPOSITION OF TRITIUM-LABELED COMPOUNDS* 040784 P 9
TRITIUM-LABELED AMINO ACIDS* #TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF 040785 P 9
#LIQUID SCINTILLATION SPECTROMETRY OF TRITIUM-LABELED PROTEINS SEPARATED BY DISC ELECTROPHORESIS* 040792 P 10
#INTRANUCLEAR IRRADIATION WITH TRITIUM-LABELED THYMIDINE (T2241)* 064739 P 34
IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND # TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE 064759 P 40
#USE OF TRITIUM-LABELED THYMIDINE IN STUDIES ON SYNTHESIS OF DNA* 064760 P 40
#TOXICITY OF TRITIUM-LABELED THYMIDINE* 040786 P 9
CHROMATID ABERRATIONS INDUCED IN CHINESE HAMSTER CELLS BY TRITIUM-LABELED THYMIDINE* #THE KINETICS OF 040790 P 10
OF DRUGS ON INTESTINAL CIRCULATION AND THE ABSORPTION OF TRITIUM-LABELED WATER IN THE SMALL INTESTINE OF RATS* 041886 P 11
#TOXICITY OF TRITIUM-LABELED WATER* 040788 P 9
#RADIOTOXICITY OF INTRANUCLEAR TRITIUM, 125-IODINE AND 131-IODINE* 072215 P 53
#THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITRIUM ON PREIMPLANTATION MOUSE EMBRYOS* 082373 P 57
WATER IN THE MOUSE, RAT, GUINEA-PIG AND RABBIT UNDER TROPICAL CONDITIONS AND THE EFFECT OF CLIMATE AND SALINE 043182 P 18
#TRITIUM MOVEMENT IN SOIL OF TROPICAL RAIN FOREST* 028688 P 3
#RADIOECOLOGICAL STUDIES OF TRITIUM MOVEMENT IN A TROPICAL RAIN FOREST* 056628 P 29
INDEX IN CELL TYPES OF ADULT MICE, RAT FETUSES, ASCITES TUMOR CELLS* FLUCTUATIONS IN THE 3H-INDEX AND THE MITOTIC 040668 P 4
TUMOR INDUCTION IN MICE BY RADIOACTIVE THYMIDINE (T3356)* 064735 P 33
#UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.* 051967 P 27
SYNTHESIS OF #BIOLOGICAL PROPERTIES AND RADIOSENSITIVITY OF TUMOURS. DETERMINATION OF THE CELL-CYCLE AND TIME OF 054673 P 28
#BODY WATER TURNOVER IN CATTLE WITH PARASITIC GASTROENTERITIS* 041887 P 11
T0073)* # TURNOVER OF TRITIUM FROM THYMIDINE IN TISSUES OF RAT (064756 P 39
#3H-2-GLUCOSE AS TRACER IN TURNOVER STUDIES (T7591)* 064763 P 41
MOUSE* #STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. GROSS STUDIES ON THE 043591 P 20
MOUSE* #STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. I. GROSS STUDIES ON THE 049604 P 24
STUDIES WITH TRITIUM AND DEUTERIUM.* #STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE 051582 P 27
DYNAMIC STATE OF BODY CONSTITUENTS IN #STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS TRACER. 5. PREDOMINANTLY NON- 067124 P 50
THE GENE* #THE CHARACTERIZATION OF REVERTANTS OF TWO LOCI IN E. COLI WWU - A STUDY OF RADIATION ACTION ON 040682 P 7
FLUCTUATIONS IN THE 3H-INDEX AND THE MITOTIC INDEX IN CELL TYPES OF ADULT MICE, RAT FETUSES, ASCITES TUMOR CELLS* 040668 P 4
#THE TRITIUM RATE EFFECT IN TYROSINASE-CATALYZED HYDROXYLATION.* 051589 P 27
#INCORPORATION OF THYMIDINE INTO DNA OF MOUSE ORGANS (T0031)* 064738 P 34
#TURNOVER OF TRITIUM FROM THYMIDINE IN TISSUES OF RAT (T0073)* 064756 P 39
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (T0226)* 064727 P 32
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (T0226)* 064728 P 32
INCORP INTO MOUSE DNA AND MECHANISM OF RADIATION EFFECTS (T1252)* #FOUR-FACTOR MODEL ANALYSIS OF THYMIDINE 064745 P 35
#CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (T1510)* 064743 P 35
OF ESTD AND MEASURED VALUES FOR ZN-65 AND TRITIUM (T1643)*MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON 064773 P 44
#HAZARD OF TRITIUM AS A DNA LABEL IN MAN (T1858)* 064740 P 34
#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 33
HIGHER PLANTS BY FEULGEN PHOTOMETRY AND CHEMICAL METHODS (T1858)* #MEASUREMENTS OF DNA IN 064736 P 33
OF H3-THYMIDINE IN CELLS AND ITS INCORP INTO DNA (T1858A)* AFTER PLUCKING OF HAIRS BETWEEN THE APPEARANCE 064750 P 37
#THE INFLUENCE OF DIETARY FAT ON THE INCORPORATION OF T20 IN AVIAN TISSUES* 043101 P 16
#INTRANUCLEAR IRRADIATION WITH TRITIUM-LABELED THYMIDINE (T2241)* 064739 P 34
OF TRITIATED THYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (T2243)* #INCORPORATION 064748 P 36
#EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (T2297)* 064741 P 35
#HAZARDS FROM ISOTOPIC TRACERS (T2297)* 064749 P 37
#EFFECTS OF H3-THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* 064771 P 43
EFFECTS OF TRITIATED THYMIDINE AS A DNA LABEL IN RAT LIVER (T2297)* #SOME 064755 P 39
OF TRITIUM FROM THYMIDINE INTO PROTEINS OF THE MOUSE (T2297)* #INCORPORATION 064726 P 32
WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* #INCORPORATION OF TRITIUM FROM TRITIATED 064766 P 42
IN DNA OF MOUSE TISSUES AND ON ITS RADIATION EFFECTS (T2297)* #STUDIES ON INCORP OF TRITIATED THYMIDINE 064758 P 40
TRITIATED THYMIDINE ON REPRODUCTIVE CAPACITY OF MICE (T2297)* #DELETERIOUS INFLUENCE OF ORALLY ADMINISTERED 064757 P 39
IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (T2297)* AND USE IN STUDY OF GROWTH RATES AND POTENTIALS 064759 P 40
RADIATION FROM INCORPD THYMIDINE LABELED WITH H-3 OR C-14 (T2333)* #REPRODUCTIVE DEATH OF MAMMALIAN CELLS DUE TO BETA- 064746 P 36
#LABELING OF PROTEINS BY IRRADIATION IN TRITIATED WATER (T2617B)* 067143 P 50
CYTIDINE ON ITS INCORP INTO TISSUES OF YOUNG AND OLD MICE (T2675)* #EFFECT OF SPECIFIC ACTIVITY OF H3- 064752 P 38
#RENEWAL OF CELL POPULATIONS (T2693)* 064754 P 38
AND TISSUE UPTAKE OF ALPHA- AND GAMMA-TOCOPHEROLS IN RAT (T2788)* INTESTINAL ABSORPTION, LYMPH AND PLASMA TRANSPORT, 067133 P 50
#TUMOR INDUCTION IN MICE BY RADIOACTIVE THYMIDINE (T3356)* 064735 P 33
STATE ON TRITIATED THYMIDINE UPTAKE BY RAT PITUITARY (T4647)* #EFFECT OF AGE, SEX, HORMONAL 064751 P 37
#METABOLISM AND FATE OF TRITIATED THYMIDINE IN MAN (T7585)* 064747 P 36
OF DNA UNDER CONDITIONS OF PROLONGED ADMINISTRATION (T7590)* #SPECIFICITY OF TRITIATED THYMIDINE AS A PRECURSOR 064762 P 41
#3H-2-GLUCOSE AS TRACER IN TURNOVER STUDIES (T7591)* 064763 P 41
#DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)* 064753 P 38
OF RADIOACTIVE LABEL FROM PYRIMIDINES INTO LIVER LIPIDS (T7596)* #INCORPORATION 064761 P 41
- THE FOUR-FACTOR MODEL, POOL SIZES AND GROWTH INHIBITION (T7597)* #THYMIDINE METABOLISM 064765 P 42
SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)* #FATTY ACID 064769 P 43
COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (T7605)* OF TRITIATED THYMIDINE, TRITIATED WATER AND 064772 P 43
ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF TRITIUM (T7609)* #REVIEW OF LABORATORY 064777 P 44
#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 49
#TRITIATION OF ANIMALS FROM TRITIATED WATER (CONTD) (T7734)* 067123 P 49
#TRITIATION OF ANIMALS FROM TRITIATED WATER (T7734)* 067122 P 49
NON-DYNAMIC STATE OF BODY CONSTITUENTS IN RAT (T7735)* TURNOVER WITH TRITIUM AS TRACER. 5. PREDOMINANTLY 067124 P 50

PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF 044471 P 21
#SPECIFICITY OF TRITIATED THYMIDINE AS A PRECURSOR OF DNA UNDER CONDITIONS OF PROLONGED ADMINISTRATION (T7590)* 064762 P 41
#TRANSFER AND INCORPORATION OF TRITIUM INTO GASS AND MILK UNDER NATURAL CONDITIONS* 065163 P 47
OF TRITIATED WATER IN THE MOUSE, RAT, GUINEA-PIG AND RABBIT UNDER TROPICAL CONDITIONS AND THE EFFECT OF CLIMATE AND 043182 P 18
#TRITIUM IN PINE TREES FROM SELECTED LOCATIONS IN THE UNITED STATES, INCLUDING AREAS NEAR NUCLEAR FACILITIES* 073994 P 53
1969-1970. APPENDIX, EFFECTS OF TEMPERATURE AND RADIATION UPON LARVAE OF A PACIFIC OYSTER* #COLUMBIA RIVER STUDIES 018273 P 1
#RADIATION EFFECTS UPON WATER ABSORPTION AND EXCRETION IN THE RAT* 040665 P 4
BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE # UPTAKE AND TRANSPORT OF RADIOCHLORIDE AND TRITIATED WATER 051309 P 26
BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE # UPTAKE AND TRANSPORT OF RADIONCHLORIDE AND TRITIATED WATER 043086 P 15
#EFFECT OF AGE, SEX, HORMONAL STATE ON TRITIATED THYMIDINE UPTAKE BY RAT PITUITARY (T4647)* 064751 P 37
#TRITIUM UPTAKE FOLLOWING A THERMONUCLEAR TEST* 045087 P 22

TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINCL #TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS 049600 P 23
BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN RATS.* #THE RELATIVE 054914 P 28
ABSORPTION, LYMPH AND PLASMA TRANSPORT, AND TISSUE UPTAKE OF ALPHA- AND GAMMA-TOCOPHEROLS IN RAT (T2788)* 067133 P 50
VICIA FABA (L)* # UPTAKE OF TRITIATED THYMIDINE IN THE ROOT TIP MERISTEM OF 040791 P 10
UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.* 051967 P 27
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 31
#THE MUTAGENIC EFFECT OF TRITIATED URIDINE IN DROSOPHILA SPERMATOCYTES* 040780 P 8
#TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND 064759 P 40
#WATER EXCHANGE AND BARRIERS AS STUDIED BY THE USE OF HYDROGEN ISOTOPES* 044225 P 21
#LABORATORY TRAINING MANUAL ON THE USE OF ISOTOPES AND RADIATION IN ANIMAL RESEARCH* 016938 P 1
INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. I. 042769 P 14
#NUCLEAR RADIOLESIONS CAUSED BY THE USE OF RADIOACTIVE PRECURSORS OF NUCLEIC ACID* 040674 P 5
USE OF RADIOISOTOPES IN RESEARCH IN ANIMAL METABOLISM.* 050527 P 25
BIOLOGICAL PROCESSES. SPECIAL PROBLEMS CONNECTED WITH THE USE OF TRACERS.* #THE KINETICS OF 052980 P 28
IN STUDY OF LATERAL ROOT INITIATION, #PROGRESS REPORT ON USE OF TRITIATED THYMIDINE AS INTERNAL SOURCE OF RADIATION 040782 P 8
OF INSECT TRANSPIRATION* # USE OF TRITIATED WATER (THO) FOR CONTINUOUS REGISTRATION 043105 P 17
OF DNA* # USE OF TRITIUM-LABELED THYMIDINE IN STUDIES ON SYNTHESIS 064760 P 40
#TRITIUM TRANSFER TO FOOD ITEMS FROM TRITIATED METHANE USED FOR DOMESTIC COOKING* 078468 P 56
ANALYSIS OF TRANSLOCATION IN THE PHLOEM OF THE BEAN PLANT USING THO, P-32, AND C-14.* #AN 051223 P 26
CELL-CYCLE AND TIME OF SYNTHESIS OF DEOXYRIBONUCLEIC ACID USING TRITIATED THYMIDINE AND AUTORADIOGRAPHY.* OF THE 054673 P 28
A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED THYMIDINE.* OF THE RAT AT HIGH DOSE RATES. 052834 P 28
#TOTAL BODY WATER ESTIMATIONS IN DAIRY CATTLE USING TRITIATED WATER* 043358 P 19
#THE FATE OF ISOTOPE-LABELLED UTERINE SPERMATOZOA IN THE MOUSE POSTCOITUM* 041894 P 13
ON MAMMALIAN DEVELOPMENT OF CONTINUOUS IRRADIATION IN UTERO WITH TRITIATED WATER* #SOME EFFECTS 065122 P 47

CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND TRITIUM.*(MPC)*W* FROM INTERSPECIES 051573 P 26
CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND TRITIUM (T1643)* FROM INTERSPECIES 064773 P 44
#COMPARISON OF HTO IN PLASMA AND EXPIRED WATER VAPOR* 064783 P 45
CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* #DOSE TO MAN VIA FOOD- 070396 P 52
OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL VARIABLES* #A SYSTEM FOR CORRELATING TRITIUM 069396 P 51
#CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL SURFACE* 027023 P 2
AND TRANSPORT OF RADIOCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS.* 051309 P 26
AND TRANSPORT OF RADIONCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS* 043086 P 15
OF SISTER CHROMATID EXCHANGES FOLLOWING EXPOSURE TO VARYING DOSES OF H-3 -THYMIDINE OR X-RAYS* #THE FREQUENCY 043155 P 18
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 29
#A SYSTEM FOR CORRELATING TRITIUM OXIDE TRANSPORT IN VEGETATION WITH MICROMETEOROLOGICAL VARIABLES* 069396 P 51
#HYDROGEN BUDGET AND COMPARTMENTS IN THE RAIN FOREST AT EL VERDE, PUERTO RICO, PERTINENT TO CONSIDERATION OF TRITIUM 021312 P 2
#PROCEEDINGS FROM VERMONT MEETING* 044378 P 21
TRITIATED WATER VAPOR* #DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO 070396 P 52
#UPTAKE OF TRITATED THYMIDINE IN THE ROOT TIP MERISTEM OF VICIA FABA (L)* 040791 P 10
OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.* BIOLOGICAL EFFECTIVENESS 051314 P 26
PIG, AND MAN, AND OF THE #ESTIMATION OF TOTAL BODY WATER (VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, RABBIT, GUINEA 049222 P 22
THE GASTROINTESTINAL TRACT OF MAN* #IN VITRO AUTORADIOGRAPHIC STUDIES OF CELL PROLIFERATION IN 040670 P 5
#PROGRESS REPORT ON REAPAIR OF DAMAGED DNA IN VIVO* 044763 P 21
OF TRANSFORMING DNA BY TRITIUM DISINTEGRATIONS IN VIVO* #INACTIVATION 041901 P 13
#UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.* 051967 P 27
#8 PAGES, IMMUNOLOGY, VOL. 16, PAGES 83-90 (JANUARY 1969)* 041891 P 12

1972 #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 082903 P 58
#TRITIATION OF ANIMALS FROM TRITIATED WATER (CONTD) (T7734)* 067123 P 49
OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I. 051573 P 26
OF ESTD #EST OF MAX PERMISSIBLE CONCNS OF RADICISOTOPES IN WATER (MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON 064773 P 44
TRANSPIRATION* #USE OF TRITIATED WATER (THO) FOR CONTINUOUS REGISTRATION OF INSECT 043105 P 17
#CYTOLOGICAL EFFECTS OF TRITIATED WATER (THO) ON ROOT-TIP MERISTEMS OF ALLIUM CEPA L* 043274 P 18
#LABELING OF PROTEINS BY IRRADIATION IN TRITIATED WATER (T26178)* 067143 P 50
ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)* #FATTY 064769 P 43
#TRITIATION OF ANIMALS FROM TRITIATED WATER (T7734)* 067122 P 49
GUINEA PIG, AND MAN, AND OF THE #ESTIMATION OF TOTAL BODY WATER (VIRTUAL TRITIUM SPACE) IN THE RAT, CAT, RABBIT, 049222 P 22
#RADIATION EFFECTS UPON WATER ABSORPTION AND EXCRETION IN THE RAT* 040665 P 4
OF THE SKIN TO DEUTERATED AND #A STUDY OF THE MECHANISM OF WATER ACROSS FROG SKIN BY A COMPARISON OF THE PERMEABILITY 041892 P 12
ABERRATIONS (#COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL 064772 P 43
PATIENTS FOLLOWING BURNS* #TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN 043246 P 18
TECHNIQUES FOR ANALYSIS AND MEASUREMENT OF RADIOACTIVITY OF WATER AND TRITIATED LEAF METABOLITES.* CRITICAL STUDY OF 042767 P 14
#TRITIATED WATER AS A TOOL FOR ECOLOGICAL FIELD STUDIES* 043154 P 17
SURFACE* #CONTRIBUTION OF TRITIATED WATER AT VARIOUS DEPTHS IN SOIL TO EVAPORATION AT THE SOIL 027023 P 2
#COMPARATIVE METABOLISM OF TRITIATED WATER BY MAMMALS* 043593 P 20
#UPTAKE AND TRANSPORT OF RADIOCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT 051309 P 26
#UPTAKE AND TRANSPORT OF RADIONCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT 043086 P 15
RAPID LIVE-WEIGHT CHANGES* #ESTIMATION OF WATER CONTENT BY TRITIUM DILUTION OF ANIMALS SUBJECTED TO 042852 P 15
#TOTAL BODY WATER ESTIMATIONS IN DAIRY CATTLE USING TRITIATED WATER* 043358 P 19
HYDROGEN ISOTOPES* # WATER EXCHANGE AND BARRIERS AS STUDIED BY THE USE OF 044225 P 21
GASES AND WATER STRUCTURE. THE EFFECT OF XENON ON TRITIATED WATER FLUX ACROSS THE GUT* #ANESTHETIC 042765 P 14
OF 5-HYDROXYTRYPTAMINE ON THE ABSORPTION OF TRITIATED WATER FROM THE INTESTINE OF THE RAT* #THE INFLUENCE 043152 P 17
#RADIAL EXCHANGE OF LABELED WATER IN INTACT MAIZE ROOTS* 043359 P 19
BIBLIOGRAPHIC STUDY OF #STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - 042769 P 14
OF TECHNIQUES FOR #STUDIES ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. II. CRITICAL STUDY 042767 P 14
#RADIAL EXCHANGE OF LABELED WATER IN MAIZE ROOTS* 043092 P 15
BIBLIOGRAPHIC STUDY OF THE PROBLEMS POSED BY USE OF LABELED WATER IN PLANT PHYSIOLOGY* WATER. I. INTRODUCTION - 042769 P 14
#MOVEMENT AND DISTRIBUTION OF TRITIATED WATER IN PLANTS.* 051226 P 26
OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS* BETWEEN THE BIOLOGICAL HALF-LIFE 047898 P 22
TROPICAL CONDITIONS #THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE MOUSE, RAT, GUINEA-PIG AND RABBIT UNDER 043182 P 18
FROM ADMINISTRATION OF TRITIATED FOLIC ACID AND TRITIATED WATER IN THE RAT* #RADIATION DOSES RESULTING 062623 P 31

SALINE DRINKING ON THE BIOLOGICAL HALF-LIFE OF TRITIATED WATER IN THE RAT* CONDITIONS AND THE EFFECT OF CLIMATE AND 043182 P 18
PRESENCE AND ABSENCE OF #MOVEMENT OF TRITIATED WATER IN THE ROOT SYSTEM OF HELIANTHUS ANNUUS IN THE 043304 P 19
CIRCULATION AND THE ABSORPTION OF TRITIUM-LABELED WATER IN THE SMALL INTESTINE OF RATS* DRUGS ON INTESTINAL 041886 P 11
#INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* 064766 P 42
#DIFFUSION OF TRITIATED WATER INTO ROOTS AS INFLUENCED BY WATER STATUS OF TISSUE.* 051313 P 26
#TRITIUM - DISCRIMINATION AND CONCENTRATION IN FRESH WATER MICROCOSMS* 067798 P 51
#SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL DEVELOPMENT* 049533 P 23
#THE EFFECTS OF CHRONIC IRRADIATION BY TRITIATED WATER ON POECILIA RETICULATE, THE GUPPY* 026846 P 2
STICKLEBACK* #EFFECTS OF TRITIATED WATER ON THE EMBRYONIC DEVELOPMENT OF THE THREE-SPINE 069507 P 52
#DIFFUSION OF TRITIATED WATER INTO ROOTS AS INFLUENCED BY WATER STATUS OF TISSUE.* 051313 P 26
FLUX ACROSS THE GUT* #ANESTHETIC GASES AND WATER STRUCTURE. THE EFFECT OF XENON ON TRITIATED WATER 042765 P 14
#BODY WATER TURNOVER IN CATTLE WITH PARASITIC GASTROENTERITIS* 041887 P 11
#COMPARISON OF HTO IN PLASMA AND EXPIRED WATER VAPOR* 064783 P 45
FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* #DOSE TO MAN VIA 070396 P 52
#DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE* 056179 P 29
#HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER* 061721 P 31
#TOXICITY OF TRITIUM-LABELED WATER* 040788 P 9
BODY WATER ESTIMATIONS IN DAIRY CATTLE USING TRITIATED WATER* #TOTAL 043358 P 19
LABELING DURING PHOTOSYNTHESIS WITH C(14)O2 AND TRITIATED WATER* #GLYCOLIC ACID 042770 P 14
OF CONTINUOUS IRRADIATION IN UTERO WITH TRITIATED WATER* #SOME EFFECTS ON MAMMALIAN DEVELOPMENT 065122 P 47
OF ORGANICALLY BOUND TRITIUM AND OF TRITIATED WATER* SECRETION INTO COW'S MILK AFTER ADMINISTRATION 075319 P 54
OF THE PERMEABILITY OF THE SKIN TO DEUTERATED AND TRITIATED WATER* MECHANISM OF WATER ACROSS FROG SKIN BY A COMPARISON 041892 P 12
ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. I. INTRODUCTION - BIBLIOGRAPHIC STUDY OF THE 042769 P 14
ON THE TRANSFORMATION OF WATER IN LEAVES WITH TRITIATED WATER. II. CRITICAL STUDY OF TECHNIQUES FOR ANALYSIS AND 042767 P 14
#DISTRIBUTION OF TRITIATED THYMIDINE IN ANIMALS AS SHOWN BY WATER-SOLUBLE AUTORADIOGRAPHY* 040669 P 4
BY TRITIUM DILUTION OF ANIMALS SUBJECTED TO RAPID LIVE- WEIGHT CHANGES* #ESTIMATION OF WATER CONTENT 042852 P 15
OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.*THE RELATIVE BIOLOGICAL EFFECTIVENESS 054897 P 28
#THE CHARACTERIZATION OF REVERTANTS OF TWO LOCI IN E. COLI WWU - A STUDY OF RADIATION ACTION ON THE GENE* 040682 P 7

OF CHROMOSOME DUPLICATION IN THE CELL CYCLE AS REVEALED BY X-RAY BREAKAGE AND 3H-THYMIDINE LABELING* #THE STAGE 040667 P 4
FOLLOWING EXPOSURE TO VARYING DOSES OF H-3 -THYMIDINE OR X-RAYS* #THE FREQUENCY OF SISTER CHROMATID EXCHANGES 043155 P 18
#ANESTHETIC GASES AND WATER STRUCTURE. THE EFFECT OF XENON ON TRITIATED WATER FLUX ACROSS THE GUT* 042765 P 14

BIOLOGICAL HALF-LIFE #EFFECTS OF TRITIUM Y-90, AND SR-90 + Y-90 ON THE LARVAE OF THE PACIFIC OYSTER, ESTIMATION OF 048349 P 27
OYSTER, ESTIMATION OF BIOLOGICAL HALF- #EFFECTS OF TRITIUM Y-90, AND SR-90 + Y-90 ON THE LARVAE OF THE PACIFIC 048349 P 22
OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* #NATURAL CONCENTRATION 043102 P 16
ACTIVITY OF H3-CYTIDINE ON ITS INCORP INTO TISSUES OF YOUNG AND OLD MICE (T2675)* #EFFECT OF SPECIFIC 064752 P 38

I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND TRITIUM.* FROM INTERSPECIES CORRELATIONS. 051573 P 26
THE PACIFIC OYSTER, ESTIMATION OF BIOLOGICAL HALF-LIFE FOR ZN IN OYSTER* Y-90, AND SR-90 + Y-90 ON THE LARVAE OF 048349 P 22
CORRELATIONS. I. COMPARISON OF ESTC AND MEASURED VALUES FOR ZN-65 AND TRITIUM (T1643)* WATER (MPC)W FROM INTERSPECIES 064773 P 44
TRANSPORT OF RADIOCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS.* AND 051309 P 26
TRANSPORT OF RADIONCHLORIDE AND TRITIATED WATER BY VARIOUS ZONES OF ONION ROOTS OF DIFFERENT CHLORIDE STATUS* AND 043086 P 15

VII Health Physics Aspects

VII - HEALTH PHYSICS ASPECTS

002551
ROBINSON WL + ANSPAUGH LR
ASSESSMENT OF POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT RULISON
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-50791 +. 35 PAGES, FIGURES, TABLES, REFERENCES, DECEMBER 18, 1969

THIS REPORT EVALUATES THE OFF-SITE RADIOLOGICAL HAZARDS ASSOCIATED WITH THE PROPOSED REENTRY AND TESTING OPERATIONS. WHEN FLARING OF THE NATURAL GAS IS BEGUN THE MAJOR ISOTOPE TO BE RELEASED WILL BE TRITIUM. THE REPORT THEREFORE CONSIDERS SEVERAL QUESTIONS CONCERNING THE BIOLOGY AND PHYSICS OF TRITIUM IN THE LIGHT OF THE DATA AVAILABLE IN THE LITERATURE. THE GENERAL CONCLUSIONS ARE THAT ORDINARY CALCULATIONS OF ABSORBED DOSE BASED ON ENERGY UNIFORMLY DISTRIBUTED THROUGHOUT A VOLUME ARE SUFFICIENT TO DESCRIBE THE OBSERVED EFFECTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + DOSIMETRY + *PLOWSHARE + HAZARD, RELATIVE + TESTING + *NUCLEAR DETONATION + *DOSE CALCULATION, EXTERNAL + *RADIOBIOLOGY + GAS + *OFF SITE + CONSUMER PRODUCT + ABSORPTION + *CONCENTRATION + RADIATION EFFECT

003269
MORECRAFT WT
TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR
ATOMIC ENERGY OF CANADA, LIMITED, CHALK RIVER, ONTARIO, CANADA
4 PAGES, 2 FIGURES, 1 TABLE, 2 REFERENCES- AM. INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 24- 87-90 (1963)- AECL-1697

TO CONTROL THE HAZARDS OF TRITIUM EXPOSURES AT THE NRU REACTOR OF ATOMIC ENERGY OF CANADA LIMITED, A VARIED SAFETY PROGRAM EMPHASIZES EDUCATION, MONITORING, EXHAUST VENTILATION, PROTECTIVE CLOTHING, AND BIOCHEMICAL ANALYSES FOR TRITIUM IN THE BODY. THE ICRP STANDARD OF 5 X 10 MINUS 6 MU C/CM 3 IS USED FOR MAXIMAL PERMISSIBLE EXPOSURE. TRITIUM RELEASE IS CONTROLLED BY OPERATIONAL PROCEDURES AND VENTILATION.

CANADA + HEALTH PHYSICS TRAINING + REACTOR, HWR + *PERSONNEL PROTECTIVE DEVICE + *RADIATION SAFETY AND CONTROL

004650
MCKOWN DA
HEALTH PHYSICS BIBLIOGRAPHY ON TRITIUM
LOS ALAMOS SCIENTIFIC LABORATORY
87 PAGES, MARCH 25, 1964, LAMS-2946- OTS

A LIST OF 87 PAPERS WITH ABSTRACTS IS GIVEN. THE PAPERS WERE SELECTED TO COVER THOSE ASPECTS OF THE SUBJECT WHICH WOULD BE OF INTEREST TO MONITORING AND HEALTH PHYSICS PERSONNEL INVOLVED IN RADIATION PROTECTION WORK. A FEW BIBLIOGRAPHIES ARE LISTED.

*BIBLIOGRAPHY + MONITOR, GENERAL PRACTICE

004672
STUDY IV-313, HAZARDS ANALYSIS, RADIOLOGICAL HAZARDS
ALLIS-CHALMERS MANUFACTURING COMPANY
156 PAGES, TABLES, FIGURES, 11 REFERENCES- JULY 11, 1963, ACNP-61535 (REV. 1), EGCR-STUDY IV-313, REV. 1- OTS

THE OBJECTIVES OF THIS STUDY ARE TO DETERMINE THE DOSES RECEIVED BY PERSONS LOCATED BOTH OFF SITE AND IN THE EGCR CONTROL ROOM FOLLOWING THE MAXIMUM CREDIBLE ACCIDENT, AND TO DETERMINE THE MAXIMUM DOSES RECEIVED BY PERSONS OFF THE EGCR SITE DUE TO THE NORMAL OPERATIONAL STACK RELEASE.

*ACCIDENT ANALYSIS + CONTAINMENT, HIGH PRESSURE + *DOSE + *EGCR (AGR) + FALLOUT + FISSION PRODUCT RELEASE + REACTOR, GCR + ACCIDENT, MAXIMUM CREDIBLE (MCA) + RAINOUT + *REPORT, SAR + VENTILATION SYSTEM + *MPD + STACK + CONTROL PANEL/ROOM

006241
HUTCHIN ME + VAUGHAN BE
SKIN CONTACT TRANSFER OF TRITIUM FROM BRASS
U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY
20 PAGES, 3 FIGURES, 2 TABLES, JUNE 29, 1964, USNRDL-TR-761 (AD-603,309)- CFSTI

THE STUDIES REPORTED HERE SHOW THAT CONTACT OF SKIN WITH CONTAMINATED METAL CAN FACILITATE THE TRANSFER OF TRITIUM, THAT THE RADIOACTIVITY ABSORBED ONTO THE SKIN ENTERS THE BODY WATER, AND THAT IT FOLLOWS THE METABOLIC PATTERN OF TRITIUM ENTERING BY OTHER MODES. TRITIUM IN THE SKIN WAS DETERMINED AFTER CONVERTING ALL FORMS TO TRITIATED WATER BY DRY COMBUSTION. STANDARDIZED EXPOSURES WERE CHECKED BY LIQUID SCINTILLATION COUNTING. CURVES FOR THE DISAPPEARANCE OF TRITIUM IN THE SKIN COULD BE RESOLVED INTO 0.3, 3, AND 14 DAY HALF-TIMES, AND AFTER 15 DAYS THERE WAS LITTLE DIFFERENCE BETWEEN WET AND DRY TISSUES. THE ACCUMULATIVE EXCRETION CURVES, BASED ON THE MEASURED HALF-TIME VALUE OF 5.5 DAYS FOR URINE RADIOACTIVITY, SHOWED THAT SUBSTANTIALLY ALL OF THE SKIN RADIOACTIVITY CAN BE ACCOUNTED FOR IN BODY WATER BY 28 DAYS.

*ANALYTICAL TECHNIQUE + *PERSONNEL EXPOSURE, RADIATION + *CONCENTRATION + MAN

006867
WATTS JR
HEALTH PHYSICS UTILIZATION OF AN IBM 1620 COMPUTER
SAVANNAH RIVER PLANT
6 PAGES, MAY 1963, DPSPU-63-30-1- PRESENTED AT 8TH ANNUAL HEALTH PHYSICS MEETING, NEW YORK CITY, JUNE 1963

MANY ROUTINE HEALTH PHYSICS FUNCTIONS ARE PERFORMED, AND MORE COMPLICATED SPECIAL PROBLEMS ARE EVALUATED, BY AN IBM 1620 COMPUTER. AUTOMATION OF RADIOACTIVE ASSAY TECHNIQUES IMPROVES THE UTILIZATION OF EMPLOYEES AND THE QUALITY AND QUANTITY OF DATA. PARTICULAR USES OF THE COMPUTER ARE DISCUSSED, AND ADVANTAGES OF USING IT ARE POINTED OUT.

*CRUSTACEAN + *COMPUTER PROGRAM + SAMPLING + GROSS ALPHA + GROSS BETA

006997
COWPER G
THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER NUCLEAR LABORATORIES
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER
12 PAGES, 5 FIGURES, 5 REFERENCES- FEBRUARY 1965, AECL-2154 (CONF-650302-3)(SM-56/29)- PRESENTED AT I. A. E. A. SYMPOSIUM ON PERSONNEL DOSIMETRY FOR ACCIDENTAL HIGH-LEVEL EXPOSURE TO EXTERNAL AND INTERNAL RADIATION, VIENNA, MARCH 8-12, 1965- AECL

THE FOLLOWING CONSIDERATIONS ARE IMPORTANT IN DEALING WITH EMERGENCY HIGH EXPOSURE LEVELS. (A) RELIABILITY OF METHODS IS OF GREATER IMPORTANCE THAN ACCURACY. (B) INSTRUMENTS AND METHODS WHICH RECEIVE ONLY OCCASIONAL USE SHOULD BE AS SIMPLE AS POSSIBLE. (C) ROUTINE SERVICES SHOULD HAVE THE CAPABILITY OF ABSORBING SUDDEN INCREASES IN WORK LOAD.

DOSIMETRY + *MONITOR, EMERGENCY + MONITOR, PERSONNEL + *RADIATION PROTECTION, ORGANIZATION + *CHALK RIVER + CONTAMINATION + PERSONNEL EXPOSURE, RADIATION

007226
BARRY PJ
MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
29 PAGES, 29 REFERENCES, 11 TABLES, OCTOBER 1962, CRER-1098 (AECL-1624)- AECL

THE MAXIMUM PERMISSIBLE CONCENTRATIONS IN AIR OF VARIOUS BIOLOGICALLY SIGNIFICANT RADIONUCLIDES HAVE BEEN CALCULATED FOR MEMBERS OF THE PUBLIC WHO LIVE IN THE NEIGHBORHOOD OF A NUCLEAR POWER REACTOR. THEY HAVE BEEN CALCULATED BOTH FOR CONTINUOUS EXPOSURE DURING ROUTINE REACTOR OPERATION AND ALSO FOR EMERGENCIES RESULTING FROM REACTOR ACCIDENTS. THE RECOMMENDATIONS ARE NOT INTENDED TO BE USED AS NORMAL HEALTH PHYSICS CONTROL LEVELS BUT TO SERVE AS A GUIDE TO REACTOR DESIGNERS. THE PROBLEMS OF ATMOSPHERIC DIFFUSION ARE DISCUSSED AND VALUES FOR MAXIMUM PERMISSIBLE DISCHARGES OR DISCHARGE RATES ARE RECOMMENDED SO THAT THE MAXIMUM PERMISSIBLE CONCENTRATIONS IN AIR SHOULD NOT BE EXCEEDED.

CARBON + CESIUM + ECOLOGY + ATMOSPHERIC DIFFUSION + EFFLUENT + IODINE + *MPC + STRONTIUM + AGRICULTURE + *AIR + DIETARY HABIT + DOSE CALCULATION, INTERNAL + POPULATION EXPOSURE + DOSE CALCULATION, EXTERNAL + ICRP + REACTOR POWER

007363
MCREE PC + WEST CM + MCLENDON JD
Y-12 RADIATION SAFETY MANUAL
Y-12 PLANT, OAK RIDGE, TENNESSEE
115 PAGES, 64 FIGURES, 9 REFERENCES, TABLES- MAY 11, 1965, Y-1401 (REVISED)- CFSTI

THIS REPORT IS A COMPREHENSIVE OUTLINE OF THE PROGRAMS OR METHODS BY WHICH THE HEALTH PHYSICS DEPARTMENT DISCHARGES ITS RESPONSIBILITIES WITH REGARD TO FULFILLING THE POLICIES OF THE Y-12 PLANT. LINE ORGANIZATION IS RESPONSIBLE FOR THE PROTECTION OF PLANT EMPLOYEES TO THE SAME EXTENT THAT IT IS RESPONSIBLE FOR PLANT OPERATIONS, PRODUCTION, OR RESEARCH. WHILE THE PRIME RESPONSIBILITY FOR IMPLEMENTING THE POLICY RESTS WITH LINE SUPERVISION, STAFF AND SERVICE GROUPS HAVE BEEN ESTABLISHED TO PROVIDE TECHNICAL ASSISTANCE, TO RENDER ANY SERVICE THAT WILL HELP IN THE INVESTIGATION AND EVALUATION OF RADIATION AND INDUSTRIAL HYGIENE PROBLEMS, TO MAINTAIN EXPOSURE RECORDS, AND TO GIVE PROPER TRAINING TO EMPLOYEES.

DOSIMETRY + MPC + MONITOR, LIQUID + MONITOR, PERSONNEL + PLUTONIUM + REGULATION + THORIUM + WASTE DISPOSAL + MPD + MONITOR, AIR + SAMPLING + ANALYTICAL TECHNIQUE + MONITOR, ENVIRONMENTAL + INSTRUMENT CALIBRATION + *RADIATION PROTECTION, ORGANIZATION + DOSE CALCULATION, EXTERNAL + EMERGENCY PROCEDURE + RADIATION SAFETY AND CONTROL + EXCRETION, URINE

007390
KUBOSE DA
THE NITROUS OXIDE DOSIMETER--INFLUENCE OF CELL DIAMETER ON THE NITROGEN YIELD
U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, SAN FRANCISCO, CALIFORNIA
8 PAGES, 2 TABLES, 11 REFERENCES- JANUARY 5, 1965, USNRDL-TR-806- DDC

THE EFFECT OF CELL DIAMETER ON THE NITROGEN YIELD FROM COBALT-60 GAMMA-IRRADIATED GASEOUS NITROUS OXIDE HAS BEEN EXAMINED. THE FRICKE DOSIMETER WAS USED AS THE REFERENCE OF ABSORBED DOSE. THE DOSE ACTUALLY ABSORBED BY THE GAS WAS CALCULATED BY THE BRAGG-GRAY PRINCIPLE. THE RESULTS

007390 *CONTINUED*
OBTAINED INDICATE THERE IS NO SIGNIFICANT DEPENDENCE OF NITROGEN YIELD ON CELL DIAMETER. THE MEAN NITROGEN YIELD OF 11.4+-0.8 OBTAINED HERE COMPARED WELL WITH VALUES REPORTED BY OTHER WORKERS.

COBALT + *DOSIMETRY + DOSE MEASUREMENT, EXTERNAL + DOSE CALCULATION, EXTERNAL

007399
GIBSON JA
THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
8 PAGES, 1 TABLE, 5 REFERENCES- JUNE 1963, AERE-M-1169- HMSO

THE RATE OF EVOLUTION OF TRITIUM FROM TRITIUM SOURCES ABSORBED ON TITANIUM WAS MEASURED WITH A FLOW IONISATION CHAMBER TO ASSESS THE POSSIBLE HAZARD THAT MAY ARISE FROM THESE SOURCES. IT WAS FOUND THAT THE RATE OF TRITIUM EVOLUTION WAS LESS THAN 20 MICROCURIES PER 8 HOURS PER CURIE OF ABSORBED TRITIUM. IT SEEMS UNLIKELY THAT THE EVOLVED TRITIUM WOULD PRESENT AN INGESTION OR INHALATION HAZARD. THE BREMSSTRAHLUNG RADIATION WAS ALSO MEASURED AND WOULD BE A NEGLIGIBLE HAZARD UNDER NORMAL CIRCUMSTANCES. SOURCES USED AS TARGETS FOR PARTICLE ACCELERATORS MAY PRESENT INGESTION OR INHALATION HAZARDS DUE TO LOSS OF PARTICULATE MATERIAL IF THE SOURCES ARE STORED IN THE OPEN LABORATORY.

HAZARD, RELATIVE + *HAZARDS ANALYSIS + PERSONNEL EXPOSURE, RADIATION

007411
ASSESSMENT OF RADIOACTIVITY IN MAN. VOLUME II.
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
650 PAGES, FIGURES, TABLES, REFERENCES- OCTOBER 1964, STI/PUB/84, PROCEEDINGS OF THE SYMPOSIUM ON THE ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN, HEIDELBERG, MAY 11-16, 1964, (CONF448)

THIS SYMPOSIUM ON THE ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN WAS ORGANIZED JOINTLY BY THE INTERNATIONAL ATOMIC ENERGY AGENCY, THE INTERNATIONAL LABOUR ORGANIZATION AND THE WORLD HEALTH ORGANIZATION AND WAS HELD IN HEIDELBERG FROM 11-15 MAY 1964. IT WAS THE OBJECTIVE OF THE SYMPOSIUM TO BRING TOGETHER EXPERTS FROM THE VARIOUS SCIENTIFIC DISCIPLINES OF PHYSICS, CHEMISTRY, BIOLOGY, MEDICINE AND MATHEMATICS, AND TO SURVEY THEIR EXPERIENCE IN THE ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN AND THE RESULTANT RADIATION DOSES. IN MOST INVESTIGATIONS OF INTERNAL CONTAMINATION THE ERRORS IN THE PHYSICAL MEASUREMENTS ARE SMALLER THAN THE ERRORS ASSOCIATED WITH THE INTERPRETATION OF MEASUREMENTS. FOR THIS REASON SPECIAL EMPHASIS WAS LAID IN THIS MEETING ON THE INTERPRETATION OF MEASURED DATA. VOLUME II INCLUDES THOSE PAPERS CONCERNED WITH RADIOISOTOPES OF SPECIFIC ELEMENTS- CAESIUM, RADIUM, RADON, STRONTIUM, TRITIUM, THORIUM, URANIUM, PLUTONIUM AND RARE EARTH ELEMENTS.

CESIUM + INGESTION + PLUTONIUM + STRONTIUM + URANIUM + RARE EARTH + ANALYTICAL TECHNIQUE + DOSE CALCULATION, INTERNAL + RADIUM + RADON + COUNTER, WHOLE BODY + POPULATION EXPOSURE + PERSONNEL EXPOSURE, RADIATION + RADIOCHEMICAL ANALYSIS + *CONCENTRATION + MAN

007420
JACKSON S + DOLPHIN GW
THE ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
21 PAGES, 9 FIGURES, 89 REFERENCES- JANUARY 1965, AHSB(RP)-R-51

DETERMINATION OF THE AMOUNT OF RADIONUCLIDE IN URINE HAS AS ITS OBJECT THE BEST PRACTICABLE ESTIMATE OF THE RADIATION DOSE COMMITTMENT TO THE CRITICAL ORGAN. IT IS DESIRABLE TO ANALYZE A CAREFULLY PLANNED SERIES OF URINE SAMPLES TO PROVIDE DATA FOR A COMPARISON WITH THE BEST DOCUMENTED CASES OF DEFINED INTAKE, WHICH PROVIDE THE BASIS FOR INTERPRETATION. THE PRIMARY PURPOSE OF ROUTINE URINE ANALYSIS OF SAMPLES FROM A GROUP OF RADIATION WORKERS IS TO DETECT ANY SIGNIFICANT INTAKE WHICH HAS OTHERWISE ESCAPED ATTENTION. A REVIEW IS PRESENTED OF THE HUMAN DATA AVAILABLE ON THE METABOLISM AND EXCRETION OF CAESIUM, PHOSPHORUS, POLONIUM, RADIUM, STRONTIUM, SULPHUR, TRITIUM AND URANIUM, AND VALUES OF INVESTIGATION LEVEL ARE SUGGESTED FOR THESE RADIONUCLIDES.

CESIUM + PLUTONIUM + STRONTIUM + MPD + PHOSPHORUS + SULFUR + DOSE CALCULATION, INTERNAL + RADIUM + PERSONNEL EXPOSURE, RADIATION + CONCENTRATION + MAN

007422
HEALTH PHYSICS AND MEDICAL DIVISION PROGRESS REPORT. JANUARY - DECEMBER 1964
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
33 PAGES, 9 FIGURES, 7 TABLES, 66 REFERENCES- MARCH 1965, AERE-PR/HPM-7- HMSO, $1.60

THIS ANNUAL REPORT OF THE HEALTH PHYSICS AND MEDICAL DIVISION IS DEVOTED PRIMARILY TO RESEARCH. MEASUREMENTS HAVE BEEN MADE OF THE UPTAKE BY BABIES OF (FALL-OUT) CAESIUM-137 FROM FOOD. PROGRESS ON THE ACCURATE MEASUREMENT AND COMPUTER ANALYSIS OF GAMMA-RAY SPECTRA HAS CONTINUED. FURTHER PROGRESS WAS MADE IN OUR DEVELOPMENT OF A COMPREHENSIVE SYSTEM OF PERSONNEL DOSIMETRY. THE PROTOTYPES OF THE AUTOMATIC PROTON-TRACK COUNTER (FOR NUCLEAR EMULSION DOSIMETERS) AND THE FULLY AUTOMATIC DENSITOMETER FOR MEASURING THE FILM DENSITIES OF THE TYPE ERP FILM DOSIMETER WERE DELIVERED AND ARE BEING COMMISSIONED. INVESTIGATIONS INTO THE PROBABLE BEHAVIOUR AND CONTROL OF RADIOIODINE RELEASED IN AN ACCIDENT TO A GAS-COOLED REACTOR HAVE BEEN CONTINUED AND EXTENDED TO

007422 *CONTINUED*
INCLUDE SIMILAR PROBLEMS ASSOCIATED WITH WATER-COOLED REACTORS.

ADSORPTION + AIRBORNE RELEASE + CESIUM + COMPUTER PROGRAM + DEPOSITION + *DOSIMETRY + FALLOUT + INGESTION + INHALATION + *IODINE + PLUTONIUM + STRONTIUM + MONITOR, AIR + SAMPLING + CHARCOAL + SOIL, NUCLIDE OCCURRENCE + COUNTER, WHOLE BODY + DIFFUSION COEFFICIENT + ION EXCHANGE + PARTICLE SIZE DISTRIBUTION + RADIOCHEMICAL ANALYSIS + RESUSPENSION + SPECTROMETRY, ALPHA + SPECTROMETRY, GAMMA + *CONCENTRATION + MAN

007430
BLOCK S + KATHREN RL + KUSIAN R + KINDEKEN CL + SCHIMMELFENNIG V
INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 19
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
38 PAGES- MAY 23, 1965, UCRL-14116, CFSTI, $2.00 CY, $0.50 MN

BOTH SUBJECT AND AUTHOR INDEXES ARE GIVEN FOR THE FIRST 19 QUARTERLY REPORTS (THROUGH DECEMBER 1964) OF THE HAZARDS CONTROL DEPARTMENT OF LAWRENCE RADIATION LABORATORY, LIVERMORE. THE SUBJECT INDEX IS CROSS-REFERENCED TO SERVE THE INTERESTS OF WORKERS IN VARIOUS DISCIPLINES WITHIN THE FIELD OF HEALTH AND SAFETY. A TOTAL OF 275 ARTICLES ARE INDEXED.

AIR CLEANING + BERYLLIUM + COUNTER + DECONTAMINATION + DEUTERIUM + DOSIMETRY + FALLOUT + GLOVE BOX + IODINE + MERCURY + MONITOR, STACK + PLUTONIUM + URANIUM + WASTE DISPOSAL + MONITOR, AIR + SAMPLING + INSTRUMENT CALIBRATION + COUNTER, WHOLE BODY + *HAZARDS ANALYSIS + MONITOR + REACTOR + SHIELDING + X-RAY + SPECTROMETRY, GAMMA + INSTRUMENTS, MISC. + FILTERS

007461
JONES HG + LAMBERT BE
THE RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, SURREY
14 PAGES, TABLES, FIGURES, REFERENCES- 1964, SYMPOSIUM ON ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN, HEIDELBERG, FEDERAL REPUBLIC OF GERMANY, MAY 11-16, 1964- CONF-448-16 (SM-52/21)

THE TRADITIONAL RADIOACTIVE CONSTITUENT OF LUMINOUS COMPOUNDS HAS BEEN RADIUM, A SUBSTANCE OF POTENTIALLY GREAT HAZARD. IN RECENT YEARS, SUITABLE ALTERNATIVES TO RADIUM HAVE BEEN SOUGHT AND IN THE UK AND ELSEWHERE OFFICIAL ENCOURAGEMENT HAS BEEN GIVEN TO THE USE OF TRITIATED COMPOUNDS. WE HAVE FOR SOME TIME BEEN MONITORING THE URINE OF USERS OF THESE TRITIATED COMPOUNDS AND HAVE MADE COMPLEMENTARY MEASUREMENTS OF TRITIUM IN AIR. THE STABILITY OF THE COMPOUNDS THEMSELVES HAS ALSO BEEN INVESTIGATED.

INGESTION + INHALATION + MPC + MONITOR, PERSONNEL + *UNITED KINGDOM + MONITOR, ENVIRONMENTAL + RADIUM + *HAZARDS ANALYSIS + CONCENTRATION + MAN

007507
HEALTH AND SAFETY DIVISION ANNUAL PROGRESS REPORT, 1963
IDAHO OPERATIONS OFFICE, USAEC
93 PAGES, 21 FIGURES, 18 FIGURES, REFERENCES- AUGUST, 1964, IDO-12037, CFSTI, $3.00

THIS PROGRESS REPORT SUMMARIZES FOR 1963 THE SIGNIFICANT HEALTH AND SAFETY DATA CHARACTERIZING THE PROTECTION PROGRAM FOR OVER 5000 PERSONS AT THE NATIONAL REACTOR TESTING STATION IN SOUTHEASTERN IDAHO. INFORMATION PRESENTED HERE IS BRIEFED FOR THE READERS CONVENIENCE, AND EMPHASIZES THE MAJOR INNOVATIONS, CONCEPTS, AND NEW TRENDS. REPETITIVE INFORMATION, ESSENTIAL FOR PERSPECTIVE IN A CONTINUING PROGRAM, HAS BEEN KEPT TO A MINIMUM, ALLOWING SPACE FOR REPORTING DEVELOPMENTS CONSIDERED TO BE OF SPECIAL INTEREST TO PERSONS WORKING IN THE FIELD OF HEALTH AND SAFETY.

CESIUM + COBALT + DEPOSITION + *DOSIMETRY + FISSION GAS RELEASE + GEOLOGY + IODINE + IONOSPHERE + SPERT 1 (S-RR) + STRONTIUM + *SURVEY, ENVIRONMENT + WASTE DISPOSAL, TERRESTRIAL + WASTE STORAGE + CALCINATION + AIR + MILK + WATER, DRINKING + MONITOR, ENVIRONMENTAL + GROUND WATER, NUCLIDE OCCURRENCE + INSTRUMENT CALIBRATION + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, SOLID + COUNTER, WHOLE BODY + DOSE MEASUREMENT, EXTERNAL + HAZARDS ANALYSIS + METEOROLOGICAL SUPPORT + *WASTE MANAGEMENT + HYDROLOGY + IDAHO FALLS + ION EXCHANGE + MINERAL EXCHANGE + PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + *RADIOCHEMICAL ANALYSIS + SOIL PROPERTY + SPECTROMETRY, ALPHA + SPECTROMETRY, GAMMA + CONCENTRATION + FOOD

007577
DUNNER JE
GENERAL HANDBOOK FOR RADIATION MONITORING
LOS ALAMOS SCIENTIFIC LABORATORY
180 PAGES, FIGURES, TABLES, 28 REFERENCES- NOVEMBER 1958, LA-1835(3D. ED.)- GPO

THE FIRST EDITION OF THE GENERAL HANDBOOK FOR RADIATION MONITORING WAS PREPARED IN 1952 AS AN ATTEMPT TO PROVIDE THE MEMBERS OF THE MONITORING GROUP AT THE LOS ALAMOS SCIENTIFIC LABORATORY WITH THE BASIC DATA WHICH IT WAS FELT SHOULD BE AVAILABLE TO THEM AT ALL TIMES. THIS, THE THIRD EDITION, HAS BEEN ALMOST ENTIRELY REWRITTEN AND ITS PUBLICATION WAS DELAYED TO PERMIT INCLUSION OF THE MOST UP-TO-DATE DATA FOR PERMISSIBLE EXPOSURES AND PERMISSIBLE BODY BURDENS. THE FORMAT REMAINS UNCHANGED, HOWEVER, AND THE HANDBOOK IS STILL DESIGNED TO SERVE THE PURPOSES OF THE LOS ALAMOS SCIENTIFIC LABORATORY. NOT ALL OF THE QUANTITIES GIVEN HAVE OFFICIAL SANCTION- THERE ARE SOME INSTANCES WHERE OFFICIAL NUMBERS DO NOT EXIST, BUT IT IS NECESSARY TO ESTABLISH SOME LEVEL WHICH CAN SERVE AS A GUIDE IN LOCAL WORK.

*ADMINISTRATIVE CONTROL + DECONTAMINATION + DOSIMETRY + MPC + MONITOR, EMERGENCY + MONITOR, GENERAL PRACTICE + MONITOR, PERSONNEL + PERSONNEL PROTECTIVE DEVICE + REGULATION + SURVEY, EMERGENCY + MPD + SAMPLING + AIR +

007577 *CONTINUED*
ANALYTICAL TECHNIQUE + GROSS ALPHA + GROSS BETA + GROSS GAMMA + RADIATION UNIT + LASL + RADIATION PROTECTION, ORGANIZATION + MONITOR + PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + EXCRETION, URINE

007677
BUTLER HL + LEROY JH
OBSERVATION OF BIOLOGICAL HALF-LIFE OF TRITIUM
SAVANNAH RIVER LABORATORY
3 PAGES, 3 FIGURES, 2 TABLES, 10 REFERENCES- HEALTH PHYSICS 11(4)- 283-285 (APRIL, 1965)

OVER THE PAST 10 YEARS 309,000 URINE SAMPLES HAVE BEEN RADIOASSAYED FOR TRITIUM IN SRPS HEALTH PHYSICS PROGRAM. MOST OF THESE WERE ANALYZED USING A LIQUID SCINTILLATION COUNTING TECHNIQUE DEVELOPED AT SRP. IN 310 CASES THE TRITIUM CONCENTRATION IN URINE WAS AT LEAST 20 MICRO CURIES PER LITER. THE BIOLOGICAL HALF-LIFE VALUES FOR THESE CASES RANGED FROM 4 TO 18 DAYS, WITH AN AVERAGE OF 9.5 PLUS MINUS 4.1 DAYS (90 PERCENT CONFIDENCE LEVEL). FACTORS WHICH INFLUENCE BIOLOGICAL HALF-LIFE, SUCH AS OUTDOOR TEMPERATURES, AMOUNT OF TRITIUM ASSIMILATED, AND AGE OF EMPLOYEE WERE STUDIED. DURING THE WARMER MONTHS, THE AVERAGE HALF-LIFE WAS OBSERVED TO BE LOWER- THIS WAS ATTRIBUTED TO INCREASED WATER INTAKE. DATA SHOWED NO CORRELATION BETWEEN THE AMOUNT ASSIMILATED AND BIOLOGICAL HALF-LIFE. A TREND TOWARD A SHORTER HALF-LIFE WAS OBSERVED FOR INCREASING AGE.

*SAVANNAH RIVER PLANT + *CONCENTRATION + MAN

007790
HARLEY JH
INDIRECT METHODS OF ESTIMATING RADIONUCLIDE BODY BURDEN OR EXPOSURE
NEW YORK OPERATIONS OFFICE
17 PAGES, REFERENCES- DECEMBER, 1964, EUR-2210 (CONF-621002)- INTERNATIONAL SYMPOSIUM ON RADIOACTIVE CONTAMINATION OF WORKERS HELD IN MUNICH FROM OCTOBER 24-26, 1962- PP 201-217 OF RADIOACTIVE CONTAMINATION OF WORKERS

A BRIEF DISCUSSION OF THE CHIEF INDIRECT METHOD FOR ESTIMATING THE BODY CONTENTS OF MANY ALPHA AND BETA EMITTERS, WHICH IS THE MEASUREMENT OF THEIR EXCRETION IN URINE, FAECES, OR EXHALED BREATH, IS GIVEN. A BIBLIOGRAPHY ON TECHNIQUES USED IN THE INDIRECT DETERMINATION OF RADIONUCLIDE BODY BURDEN IS ALSO PRESENTED.

PLUTONIUM + STRONTIUM + THORIUM + URANIUM + ANALYTICAL TECHNIQUE + RADIUM + RADON + DOSE MEASUREMENT, INTERNAL + *CONCENTRATION + EXCRETION, URINE + MAN

007852
JACKSON S + TAYLOR NA
A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES IN URINE
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL AND ALDERMASTON
25 PAGES, 6 TABLES, 45 REFERENCES- SM-52/16, P. 169 OF STI/PUB/84 (CONF-448-13)- SYMPOSIUM ON ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN, HEIDELBERG, FEDERAL REPUBLIC OF GERMANY, MAY 11-16, 1964

IN ASSESSING THE FUNCTION AND SCOPE OF URINE ANALYSIS, THE FACTORS AFFECTING THE CHOICE OF A SUITABLE ANALYTICAL METHOD ARE DISCUSSED. THE SENSITIVITY AND PRECISION OF THE METHOD MUST BE ADEQUATE IN RELATION TO THE MAXIMUM PERMISSIBLE BODY BURDEN, THE EXCRETION RATE AND THE SAMPLING FREQUENCY- THE METHOD MUST BE SUFFICIENTLY SPECIFIC OR SELECTIVE TO ELIMINATE THE POSSIBILITY OF INTERFERENCE BY OTHER RADIONUCLIDES- AND FINALLY, THE COST MUST BE ASSESSED IN RELATION TO ALL THESE FACTORS AND ALSO TO THE SPEED AND CONVENIENCE OF THE METHOD. THE ELEMENTS WHICH ARE OF GREATEST IMPORTANCE IN THE UKAE PROGRAMMES OF URINE ANALYSIS ARE PLUTONIUM, URANIUM, TRITIUM AND FISSION PRODUCTS (NOTABLY STRONTIUM 90 AND CAESIUM-137). FROM THE AVAILABLE DATA ABOUT THEIR METABOLISMS AN APPROXIMATE URINARY EXCRETION RATE IS PROPOSED FOR EACH OF THE ABOVE RADIONUCLIDES.

CARBON + CESIUM + ECONOMICS + *MPBB + PLUTONIUM + STRONTIUM + THORIUM + UNITED KINGDOM + URANIUM + PHOSPHORUS + POLONIUM + SAMPLING + SULFUR + *ANALYTICAL TECHNIQUE + GROSS ALPHA + GROSS BETA + PROTACTINIUM + RADIUM + AMERICIUM + EXCRETION, URINE

007862
HEALTH PHYSICS
INSTITUTT FOR ATOMENERGI, KJELLER RESEARCH ESTABLISHMENT, KJELLER, NORWAY
25 PAGES, 13 FIGURES- OCTOBER 1964, KR-79, PP. 23-25 OF QUARTERLY PROGRESS REPORT, APRIL-MAY-JUNE 1964- DEP/MN

HEALTH PHYSICS ACTIVITIES INCLUDING THE FILM BADGE SERVICE, BIOASSAY, ENVIRONMENTAL SURVEILLANCE AND THE MONITORING SYSTEM IN METALLURGICAL LABORATORY II FOR THE PERIOD APRIL - JUNE 1964, ARE SUMMARIZED.

CERIUM + CESIUM + IODINE + PLUTONIUM + RUTHENIUM + STRONTIUM + *SURVEY, ENVIRONMENT + URANIUM + MANGANESE + MONITOR, AIR + MONITOR, GAS + PHOSPHORUS + SURFACE WATER, NUCLIDE OCCURRENCE + GROSS ALPHA + GROSS BETA + GROSS GAMMA + SURFACE WATER, SEDIMENT + WASTE DISPOSAL, LIQUID + DOSE MEASUREMENT, EXTERNAL + DOSE MEASUREMENT, INTERNAL + MONITOR + NORWAY + PERSONNEL EXPOSURE, RADIATION + VEGETATION + CONCENTRATION + AQUATIC ORGANISM + MAN

008708
KONIG LA + ZEHME S
THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. II
ATOMPRAXIS 11 (5)- 268 +. 8 PAGES, FIGURES, TABLES, REFERENCES- MAY 1965

THE ARTICLE PRESENTS A METHOD OF CALCULATING THE LIMITS OF THE PERMISSIBLE AMOUNT OF ACTIVITY DISCHARGED FROM A NUCLEAR PLANT. A DISTINCTION IS MADE BETWEEN CONTINUOUS AND SHORT-TERM DISCHARGE. FOR PARTICULARLY IMPORTANT RADIONUCLIDES, THE LIMITS WERE CALCULATED ON THE BASIS OF THE RECOMMENDATIONS OF THE (GERMAN) FIRST RADIATION- PROTECTION ORDINANCE (1. SSVO) AND OF THE ICRP RESPECTIVELY.

BARIUM + CARBON + CESIUM + DOSE + IODINE + KRYPTON + *MPC + PLUTONIUM + STRONTIUM + XENON + ARGON + STACK + AIR + GERMANY

008806
DOLPHIN GW + JACKSON S + LISTER BA
INTERPRETATION OF BIO-ASSAY DATA
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AHSB(RP)R-41 +. 21 PAGES, 8 FIGURES, 49 REFERENCES, APRIL 1964, UKAEA

IN THIS REVIEW THREE BROAD CATEGORIES HAVE BEEN USED IN CLASSIFYING THE DIFFERENT MODES OF METABOLISM OF VARIOUS RADIONUCLIDES. THE FIRST GROUP INCLUDES THOSE RADIO-NUCLIDES WHICH ARE RATHER UNIFORMLY DISTRIBUTED THROUGHOUT THE BODY. THE SECOND GROUP INCLUDES THOSE WHICH ARE CONCENTRATED PARTICULARLY IN ONE OR MORE ORGANS OF THE BODY. THE THIRD GROUP, REALLY A SPECIALLY IMPORTANT SUB-GROUP OF THE SECOND, COMPRISES THE BONE SEEKERS. THE PATTERN OF URINARY EXCRETION AND PARTICULARLY ITS RELATIONSHIP TO THE RADIATION DOSE DELIVERED TO THE CRITICAL TISSUES, ARE DISTINCTLY DIFFERENT FOR THESE DIFFERENT GROUPS. A SUMMARY IS PRESENTED OF THE HUMAN DATA AVAILABLE ON METABOLISM AND URINARY EXCRETION OF TRITIUM, CESIUM, URANIUM, STRONTIUM, RADIUM AND PLUTONIUM. THE SMALL AMOUNT OF REFERENCE DATA AVAILABLE ABOUT THE METABOLISM OF RADIONUCLIDES IS STILL, HOWEVER, A VERY SERIOUS WEAKNESS AND A GREAT DEAL MORE RESEARCH IS URGENTLY NECESSARY.

CESIUM + INGESTION + INHALATION + MONITOR, PERSONNEL + PLUTONIUM + SODIUM + STRONTIUM + URANIUM + MPD + *DOSE CALCULATION, INTERNAL + COUNTER, WHOLE BODY + DOSE MEASUREMENT, INTERNAL + CONCENTRATION + MAN

008999
HUTCHIN ME + VAUGHAN BE
SKIN CONTACT TRANSFER OF TRITIUM FROM BRASS
U. S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, SAN FRANCISCO, CALIF.
7 PAGES, 2 TABLES, 3 FIGURES, 17 REFERENCES- HEALTH PHYSICS 11(10)- 1047-1053 (OCTOBER 1965)

THE STUDIES REPORTED HERE SHOW THAT CONTACT OF SKIN WITH CONTAMINATED METAL CAN FACILITATE THE TRANSFER OF TRITIUM, THAT THE RADIOACTIVITY ABSORBED ONTO THE SKIN ENTERS THE BODY WATER, AND THAT IT FOLLOWS THE METABOLIC PATTERN OF TRITIUM ENTERING BY OTHER MODES. TRITIUM IN THE SKIN WAS DETERMINED AFTER CONVERTING ALL FORMS TO TRITIATED WATER BY DRY COMBUSTION. STANDARDIZED EXPOSURES WERE CHECKED BY LIQUID SCINTILLATION COUNTING. CURVES FOR THE DISAPPEARANCE OF TRITIUM IN THE SKIN COULD BE RESOLVED INTO 0.3, 3 AND 14 DAY HALF-TIMES, AND AFTER 15 DAYS THERE WAS LITTLE DIFFERENCE BETWEEN WET AND DRIED TISSUES. THE ACCUMULATIVE EXCRETION CURVES, BASED ON THE MEASURED HALF-TIME VALUE OF 5.5 DAYS FOR URINE RADIOACTIVITY, SHOWED THAT SUBSTANTIALLY ALL OF THE SKIN RADIOACTIVITY CAN BE ACCOUNTED FOR IN BODY WATER BY 28 DAYS. SPECIAL METHODS WERE DEVELOPED FOR ASSAYING TRITIUM RELIABLY AT A MINIMUM LEVEL OF TWO TIMES TEN-TO-THE-MINUS-THREE MICROCURIES.

DOSE + *ANALYTICAL TECHNIQUE + PERSONNEL EXPOSURE, RADIATION + *CONCENTRATION + MAN

009022
KARP W
TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966
TRACERLAB
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12(12)- 31 (MARCH 21, 1966)

VARIOUS TRITIUM CONTAMINATED OBJECTS WERE DOUBLE BAGGED, AND PLACED IN WASTE DRUMS TO BE CEMENTED IN. EITHER DURING THE CEMENT POURING OR PUSHING DOWN A FLOATING OBJECT, TRITIUM MUST HAVE BEEN RELEASED.

*WASTE DISPOSAL + *PERSONNEL EXPOSURE, RADIATION

009025
PUECHL KH
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966
NUCLEAR MATERIALS AND EQUIPMENT CORPORATION
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12(12)- 28 (MARCH 21, 1966)

A TRITIUM EXPOSURE MAY RESULT IN A WHOLE BODY EXPOSURE OF 5 REM, DUE TO HANDLING TRITIATED WATER DURING PRODUCTION OF AN ORGANIC COMPOUND.

*PERSONNEL EXPOSURE, RADIATION + *INCIDENT, NONREACTOR

009302
KILLIAN CB
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(15) PAGE 46, APRIL 11, 1966

A CHEMIST OPENED AN EVACUATED SYSTEM SEVERAL TIMES IN A HOOD, TO ADD MATERIAL TO TRITIATED WATER. HIS CUMULATIVE INTERNAL EXPOSURE WAS 4.26 REMS DURING A THREE-WEEK PERIOD.

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION

010200
TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.
DIVISION OF STATE AND LICENSEE RELATIONS, USAEC
2 PAGES, APRIL 14, 1966, ATOMIC ENERGY CLEARING HOUSE, 12(22), PAGES 20-21 (MAY 30, 1966)

AEC INSPECTION REVEALED THAT EMPLOYEES LEAVING TRITIUM PAINTING AREAS HAD 59,000 DIS/MIN OF REMOVABLE TRITIUM ON THEIR HANDS AND STREET SHOES. EMPLOYEES HAD MONITORED THEMSELVES WITH AN ULTRAVIOLET LIGHT (USED FOR LUMINOUS PAINT) INEFFECTIVE AGAINST TRITIUM. IN ADDITION, CONTAMINATED CLOTHES ARE REUSED WITHOUT WASHING, INADEQUATE CHANGE ROOMS EXIST, AND CONTAMINATED DIAL HOLDERS ARE PASSED INTO UNRESTRICTED AREAS. AEC INDICATES THAT OTHER PAINTERS WITH CAREFUL HOUSEKEEPING CAN OPERATE WITHIN THEIR LIMITS.

*CONTAMINATION + *FAILURE, ADMINISTRATIVE CONTROL

010561
VAUGH HA
TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966
U. S. RADIUM CORPORATION
1 PAGE, JUNE 2, 1966, ATOMIC ENERGY CLEARING HOUSE, 12(27), PAGE 29 (JULY 4, 1966)

AN INDIVIDUAL BIOASSAY AVERAGED 30 MICROCURIES OF TRITIUM PER LITER FOR 7 DAYS, DUE TO TWO CONTINGENCIES NOT FORESEEN (IMPROPER HANDLING OF LEAKING TRITIUM-FILLED GLASS TUBES, AND BEING TOO CLOSE TO A LEAKING GAS-FILLING PORT).

*PERSONNEL EXPOSURE, RADIATION + *INCIDENT, NONREACTOR + FAILURE, ADMINISTRATIVE CONTROL

011635
SOUDAIN G
CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF TRITIUM IN THE PRESENCE OF INACTIVE OR ACTIVE GASES)
COMMISSARIAT A LENERGIE ATOMIQUE, CENTRE DETUDES NUCLEAIRES, FONTENAY-AUX-ROSES
CEA-R-2841 +. 60 PAGES, 21 FIGURES, 3 TABLES, 1966, THESIS PRESENTED TO TOULOUSE UNIVERSITY (FRANCE) FACULTE DES SCIENCES, MARCH 16, 1965, DEP. MN.

TRITIUM IS A DANGEROUS GAS FOR MAN, AND THE MAXIMUM ADMISSIBLE DOSES IN THE ATMOSPHERE ARE SUFFICIENTLY LOW FOR THE DOSAGE TO BE FAIRLY DIFFICULT. WE HAVE DEVELOPED AN APPARATUS FOR MEASURING SELECTIVELY THE CONTAMINATION OF AIR BY THIS GAS WHEN ALONE OR WHEN ASSOCIATED WITH OTHER GASEOUS CONTAMINANTS. THE DIFFERENTIAL APPARATUS USING TWO IONIZATION CHAMBERS MAKES IT POSSIBLE TO ELIMINATE A PARASITIC GAMMA-RADIATION FIELD. IN A FEW PARTICULAR CASES, THE PRESENCE OF THE RADIOACTIVE GAS HAS BEEN STUDIED. FROM THE PRACTICAL POINT OF VIEW, THE USE OF THESE CHAMBERS (MADE OF STAINLESS STEEL) MAKES FOR EASIER USE SINCE THE PROBLEMS CONNECTED WITH WALL ADSORPTION HAVE BEEN SATISFACTORILY RESOLVED. THE METHOD CAN BE APPLIED WITHOUT RESTRICTION AND VERY EASILY TO THE DETERMINATION OF TRACES OF TRITIUM IN AIR OR IN THE FORM OF TRITIATED WATER OR STEAM IN THE ATMOSPHERE.

COUNTER + MPC + *MPD + SAMPLING + *ANALYTICAL TECHNIQUE + DOSE MEASUREMENT, EXTERNAL + GAS

011919
COWPER G + KNIGHT GB + ROWE PC
ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1965
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-2540 +. 16 PAGES, 8 FIGURES, 3 TABLES, FEBRUARY 1966, AECL $0.50 CY

AN ANALYSIS OF OCCUPATIONAL RADIATION EXPOSURES RECEIVED BY WORKERS AT AECL SITES IN 1965 HAS BEEN CARRIED OUT BY MACHINE ACCOUNTING METHODS. RESULTS ARE PRESENTED IN TABLES AND GRAPHS.

*CANADA + DOSE MEASUREMENT, EXTERNAL + *PERSONNEL EXPOSURE, RADIATION

013458
SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM
SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE
CONF-640413 +. 138 PAGES, TABLES, SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM, LE VESINET, FRANCE, APRIL 16-18, 1964, IN FRENCH

THE 23 PAPERS, TOGETHER WITH THE DISCUSSIONS FOLLOWING THEIR PRESENTATION, PRESENTED AT THE

013458 *CONTINUED*
SEMINAR AT LE VESINET ON PROTECTION AGAINST THE DANGERS OF TRITIUM ARE COMPILED.

AVAILABILITY - SERVICE CENTRAL DE PROTECTION CONTRE LES RAYONNEMENTS IONISANTS, FRANCE, FREE.

FISSION PRODUCT RELEASE

013658
HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1965
OAK RIDGE NATIONAL LABORATORY
ORNL-3849 +. 225 PAGES, FIGURES, TABLES, OCTOBER 1965

RECENT DATA AND FINDINGS ARE SUMMARIZED IN THE AREAS OF (1) WASTE DISPOSAL, (2) RADIATION ECOLOGY, (3) RADIATION PHYSICS, (4) RADIATION DOSIMETRY (5) INTERNAL DOSIMETRY, AND (6) HEALTH PHYSICS TECHNOLOGY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U. S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $6.00 CY

*AEROSOL + CRUSTACEAN + CESIUM + ECOLOGY + DOSIMETRY + HEALTH PHYSICS TRAINING + KRYPTON + PLUTONIUM + RUTHENIUM + STRONTIUM + WASTE DISPOSAL + *WASTE DISPOSAL, TERRESTRIAL + WASTE DISPOSAL, ECONOMICS + DOSE CALCULATION, INTERNAL + RIVER, CLINCH + POPULATION EXPOSURE + DOSE MEASUREMENT, EXTERNAL + HAZARDS ANALYSIS + AMERICIUM + CURIUM + MINERAL EXCHANGE + RADIATION SAFETY AND CONTROL + WASTE DISPOSAL, HYDRAULIC FRACTURING + WASTE DISPOSAL, SALT + RADIATION EFFECT

013758
RICHMOND CR + FURCHNER JE
ESTIMATION OF RADIATION PROTECTION GUIDES - INTERSPECIES CORRELATIONS
LOS ALAMOS SCIENTIFIC LABORATORY, UNIVERSITY OF CALIFORNIA, LOS ALAMOS, NEW MEXICO
IRPA-183 +. 52 PAGES, 7 TABLES, 12 FIGURES, 28 REFERENCES, SEPTEMBER 1966, PRESENTED AT THE FIRST INTERNATIONAL CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, ROME, ITALY, SEPTEMBER 5-10, 1966

VALUES RECOMMENDED FOR MAXIMUM PERMISSIBLE CONCENTRATIONS (MPC) OF RADIONUCLIDES IN AIR AND WATER ARE FOR RETENTION BY THE BODY AND ITS COMPONENTS TISSUES ARE COMMONLY BASED ON DATA OBTAINED FROM ACUTE TRACER STUDIES IN RODENTS. CONCEPTUALLY, HOWEVER, CONDITIONS OF CHRONIC EXPOSURE FOR HUMAN SUBJECTS ARE EMBODIED IN MPC CALCULATIONS. ONE APPROACH TO RESOLVING THIS PROBLEM IS TO FIND INTERSPECIES CORRELATIONS IN RADIONUCLIDE METABOLISM AND WAYS TO EXTRAPOLATING TO MPC VALUES FOR MAN. FOLLOWING CONTINUOUS INGESTION OF A CONSTANT AMOUNT OF A MATERIAL, AN EQUILIBRIUM LEVEL WILL BE REACHED WITHIN THE BODY. THIS LEVEL IS PREDICTABLE FROM ACUTE ADMINISTRATION STUDIES. THE INTERGAL OF THE EFFECTIVE RETENTION FUNCTION (LIMITS OF ZERO TO INFINITY) IS PROPORTIONAL TO EQUILIBRIUM LEVEL AND HAS DIMENSIONS TO MULITIPLES OF THE DAILY INTAKE - EQUILIBRIUM LEVEL IS ALSO PROPORTIONAL TO RADIATION DOSE. WE HAVE DEVELOPED INTERSPECIES CORRELATIONS OF THE FORM Y EQUALS AX-B, WHICH RELATE EQUILIBRIUM LEVELS (Y) OBTAINED FOR MICE, RATS, DOGS, MONKEYS AND MAN TO G BODY WT. (X) FOR H-3 (TRITIUM WATER, NA-22, K-42, MN-54, ZN-65, RB-86, I-131, AND CS-137.

AVAILABILITY - PROCEEDINGS OF THE FIRST CONGRESS OF THE INTERNATIONAL RADIATION PROTECTION ASSOCIATION, PERGAMON PRESS, OXFORD, ENGLAND, 1967 (BOOK)

CESIUM + IODINE + *MPC + SODIUM + MANGANESE + POTASSIUM + ZINC + POPULATION EXPOSURE + RUBIDIUM + ANIMAL + CONCENTRATION + MAMMAL, DOG + MAN + MAMMAL, RODENT

014080
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION
NEW ENGLAND NUCLEAR CORPORATION
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(3) PAGES 20-21 (JANUARY 16, 1967)

(LETTER NOVEMBER 22) A CHEMIST RECEIVED 0.46 REM TRITIUM DOSE AFTER THE BREAKING OF A GLASS REACTION VESSEL BY A STIRRING BAR, WHILE INCORPORATING 175 CURIES OF TRITIUM INTO A PLASTIC.

FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION

015081
JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967
JOHN HOPKINS UNIVERSITY, BALTIMORE
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGE 34, (MARCH 13, 1967)

JOHNS HOPKINS REPORTS FEB. 21, THAT 10 CURES OF TRITIUM (IN URANIUM HYDRIDE) WERE RELEASED AS A GLASS TUBE BROKE AND THE UH BURNED SPONTANEOUSLY. TWO PERSONS WERE EXPOSED TO 3 MPC AIR, URINE SPECIMENS PEAKED AT 0.1 MPC. VENTILATION SYSTEM SPREAD AIR CONTAMINATION THROUGHOUT BUILDING. INCIDENT OCCURRED AT 6 PM.

INHALATION + *VENTILATION SYSTEM + *INCIDENT + *PERSONNEL EXPOSURE, RADIATION

015083
TRITIUM EXPOSURE AT US RADIUM CORP., DEC. 13, 1966
U.S. RADIUM CORPORATION

015083 *CONTINUED*
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGES 35-36, (MARCH 13, 1967)

U.S. RADIUM CORP. REPORTS JAN. 24 THAT AN R AND D SCIENTIST BREATHED AIR CONTAINING TRITIUM FROM A LEAKY GLASS TUBE FILL FACILITY. LATE REPORTING IS DUE TO ORIGINAL USE OF SUBMERSIBLE TRITIUM MPC (WHICH INDICATED NO OVEREXPOSURE). IF THE SOLUBLE MPC VALUE IS USED, ASSUMING OXIDATION HAD TAKEN PLACE, AN OVEREXPOSURE OCCURRED. IN ADDITION, AN ION CHAMBER INDICATED 100 TIMES HIGHER THAN AN IMPINGER SAMPLE.

*FAILURE, EQUIPMENT + INHALATION + MPC + *INCIDENT, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION

015084
TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967
U.S. RADIUM CORPORATION
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGE 36, (MARCH 13, 1967)

U.S. RADIUM CORP., JAN. 25, REPORTS THAT A DIAL PAINTER WAS EXPOSED TO 1.46 MPC, DUE TO (1) AN ACCUMULATION OF FRESHLY PAINTED DIALS NEXT TO THE MACHINE, (2) RESIDUAL CONTAMINATION OF SAMPLING-TRAIN COMPONENTS (DRY GAS METER). THE MACHINE IS COMPLETELY ENCLOSED AND KEPT AT MINUS 3 INCHES (WATER) PRESSURE, ALTHOUGH THE AIR FLOW IS BARELY PERCEPTIBLE.

*GLOVE BOX + VENTILATION SYSTEM + INCIDENT + *PERSONNEL EXPOSURE, RADIATION + FAILURE, DESIGN ERROR + FAILURE, ADMINISTRATIVE CONTROL

016512
QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C.
4 PAGES, NATIONAL BUREAU OF STANDARDS REACTOR. FINAL SAFETY ANALYSIS REPORT, SUPPL. A, PAGES 15-1/15-4, OCTOBER 1, 1966, DOCKET NO. 50-184

DISCUSS THE PROVISIONS FOR TRITIUM CONTROL FOR BOTH ON-SITE AND OFF-SITE PERSONNEL DURING NORMAL OPERATION OR IN THE EVENT OF AN ACCIDENT, INCLUDING A HEAT-EXCHANGER TUBE-BUNDLE FAILURE WHICH CAUSES CARRYOVER OF ALL PRIMARY WATER TO THE SECONDARY COOLING SYSTEM. IN THE EVENT IT IS NECESSARY TO ISOLATE THE MAIN HEAT EXCHANGER TO EFFECT TRITIUM CONTROL (OR FOR OTHER REASONS), DISCUSS HOW CORE COOLING WOULD BE ACCOMPLISHED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*DECAY HEAT + REACTOR, HWR + REACTOR, RESEARCH + REPORT, SAR + *RESPONSE TO NRC QUESTION + COOLANT PURIFICATION SYSTEM + *FAILURE, TUBING + HEAT EXCHANGERS

016916
COWSER KE + KAYE SV + ROHWER PS + SNYDER WS + STRUXNESS EG
DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I
OAK RIDGE NATIONAL LABORATORY, HEALTH PHYSICS DIVISION, TENN.
ORNL-4101 +. 210 PAGES, 13 FIGURES, 11 TABLES, 3 REFERENCES, MARCH 1967

THIS REPORT PRESENTS INFORMATION OBTAINED BY ORNL IN PHASE I OF DOSE-ESTIMATION STUDIES TO EVALUATE THE RADIOLOGICAL-SAFETY FEASIBILITY OF EXCAVATING AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. THE INFORMATION INCLUDES (1) METHODS FOR ESTIMATING EXTERNAL AND INTERNAL DOSE EQUIVALENTS, FOR QUANTIFYING THE TRANSFER OF RADIONUCLIDES THROUGH CRITICAL EXPOSURE PATHWAYS, AND FOR IDENTIFYING THE RADIONUCLIDES LIKELY TO BE CRITICAL, (2) CRITERIA FOR EVALUATING THE RADIOLOGICAL SAFETY OF THE OPERATION, AND (3) LISTS OF RADIONUCLIDES ARRANGED ACCORDING TO THE DOSE COMMITMENT THAT RESULTS FROM EXPOSURE TO A UNIT QUANTITY OF EACH RADIONUCLIDE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

ECOLOGY + *DOSE + EQUATION + FALLOUT + FRC + INGESTION + INHALATION + IODINE + SURFACE WATER, NUCLIDE OCCURRENCE + DOSE CALCULATION, INTERNAL + MONITOR, ENVIRONMENTAL + NUCLEAR DETONATION + SOIL, NUCLIDE OCCURRENCE + DOSE CALCULATION, EXTERNAL + *NUCLEAR EXPLOSION DEBRIS + PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + MATHEMATICAL TREATMENT + CONCENTRATION + MAN

017118
JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE
JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(33), PAGE 25 AND 26 (AUGUST 14, 1967)

(LETTER, JUNE 6) INSPECTION AFTER A RELEASE OF 30 CURIES OF TRITIUM INTO AN UNRESTRICTED LAB ON FEBRUARY 20 REVEALED (1) TRITIUM POSSESSED, BUT NO VALID AEC LICENSE, (2,3) SURVEYS FOR AIRBORNE TRITIUM WERE INADEQUATE, (4) TWO INDIVIDUALS WERE EXPOSED TO ABOVE MPC FOR TRITIUM, (5-7) TRITIUM WAS STORED IN AN UNRESTRICTED, UNPOSTED AREA AND RECORDS NOT KEPT, (8) THE EXPOSURE IN ITEM 4 AND THE RELEASE ITSELF WERE NOT REPORTED IN WRITING. THERE APPEARS TO BE A LACK OF CENTRAL CONTROL OF PROCUREMENT AND USE OF BY-PRODUCT MATERIAL, WITH NO ONE ASSIGNED OVERALL RESPONSIBILITY TO ENSURE COMPLIANCE WITH LICENSES.

*AIRBORNE RELEASE + COMPLIANCE + *INCIDENT + RADIATION SAFETY AND CONTROL + FAILURE, ADMINISTRATIVE CONTROL

017134
BOND VP
EVALUATION OF POTENTIAL HAZARDS FROM TRITIUM WATER
BROOKHAVEN NATIONAL LABORATORY
SM-146/13 + CONF-700810-6 +. 25 PAGES, PAPER PRESENTED AT THE INTERNATIONAL ATOMIC ENERGY AGENCY SYMPOSIUM ON ENVIRONMENTAL ASPECTS OF NUCLEAR POWER PLANTS, NEW YORK, AUGUST 10-14, 1970

THE NCRP-ICRP HAVE ESTABLISHED 1000 MICROCURIES CI AS THE MAX. PERMISSIBLE BODY BURDEN OF TRITIUM FOR OCCUPATIONAL EXPOSURE WITH BODY TISSUE AS THE CRITICAL ORGAN. A VALUE OF MICRONS CI IS ALSO LISTED WITH THE WHOLE BODY AS THE CRITICAL ORGAN. SINCE THESE FIGURES HAVE BEEN WIDELY MISINTERPRETED, IT MAY BE WELL TO EXPLAIN HOW THEY WERE OBTAINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DOSE + IAEA + HAZARD, RELATIVE + *ATMOSPHERIC POLLUTION + BETA EMITTER + DOSE CALCULATION, INTERNAL + *POPULATION EXPOSURE + ICRP + *EFFECT + ABSORPTION + CONCENTRATION + FOOD CHAIN + *TOXICITY + EXCRETION + DISTRIBUTION + TURNOVER RATE + DNA + EMBRYO + FETUS + *ORGAN + BODY BURDEN

017335
KNIGHT GB + ADAIR B
ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1966
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-2678 +. 14 PAGES, 9 FIGURES, 2 TABLES, FEBRUARY, 1967

AN ANALYSIS OF OCCUPATIONAL RADIATION EXPOSURES RECEIVED BY WORKERS AT AECL SITES IN 1966 WAS CARRIED OUT BY MACHINE ACCOUNTING METHODS. RESULTS ARE PRESENTED IN TABLES AND GRAPHS.

AVAILABILITY - ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER, ONTARIO, CANADA, $0.50 COPY

CANADA + DOSE + DOSE CALCULATION, INTERNAL + DOSE CALCULATION, EXTERNAL + *PERSONNEL EXPOSURE, RADIATION

019434
JOHNSTON JE
HEALTH PHYSICS AND MEDICAL DIVISION RESEARCH PROGRESS REPORT, JANUARY - DECEMBER 1966
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-PR-HPM-11 +. 61 PAGES, MARCH 1967

COVERS RESEARCH ON AEROSOLS, RADIATION PHYSICS (INCLUDING DOSIMETRY AND FALLOUT), METABOLIC STUDIES, BIOLOGICAL MEASUREMENTS, ANALYTICAL DEVELOPMENT, AND MEDICAL SERVICES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

AEROSOL + CESIUM + *DOSIMETRY + FALLOUT + STRONTIUM + UNITED KINGDOM + POTASSIUM + IRON + RADIUM + GAMMA + NEUTRON + RADIOLOGY + *CONCENTRATION + MAN

019535
BUSH WR
TRITIUM HAZARDS
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER
AECL-2594 +. 16 PAGES, JUNE 1966

THIS LECTURE WAS BASED ON VARIOUS TALKS ON THE RADIATION HAZARDS OF TRITIUM OXIDE WHICH HAVE BEEN GIVEN BY THE AUTHOR TO PROCESS OPERATORS AND SUPERVISORS, LABORATORY TECHNICIANS, AND MECHANICAL TRADESMEN. THE ABSORPTION OF TRITIUM OXIDE INTO THE BODY THROUGH THE SKIN AND LUNGS, ITS EXCRETION IN URINE, AND THE ADMINISTRATIVE CONTROLS (REMOVAL, CAUTION, MINOR, AND NEGLIGIBLE) ARE DESCRIBED. THE CONCENTRATION OF TRITIUM IN AIR, EXPRESSED AS MPCA, AND THE RADIATION DOSE RESULTING FROM A NUMBER OF MPCA-HOURS OF EXPOSURE ARE EXPLAINED. FINALLY, THE METHODS FOR PROTECTING AGAINST TRITIUM (VENTILATION, AIR-SUPPLIED MASKS, AND PLASTIC CLOTHING) ARE DISCUSSED.

AVAILABILITY - ATOMIC ENERGY OF CANADA LTD., $.50 COPY

AIRBORNE RELEASE + DOSE + *CHALK RIVER + CONTAMINATION

020666
VENNART J
THE USAGE OF RADIOACTIVE LUMINOUS COMPOUND AND THE NEED FOR BIOLOGICAL MONITORING OR WORKERS
RADIOLOGICAL PROTECTION SERVICE, BELMONT, SUTTON, SURREY
4 PAGES, 11 REFERENCES, HEALTH PHYSICS 13(9), PAGE 959-954, (SEPT. 1967)

THE USE OF RADIOACTIVE LUMINOUS PAINTS GIVES RISE TO IRRADIATION OF LUMINISERS AND OF THE PUBLIC USING THE LUMINISED ARTICLES. WHERE THE PUBLIC IS CONCERNED, RADIONUCLIDES WHICH DO NOT EMIT PENETRATING RADIATIONS, SUCH AS TRITIUM AND PROMETHIUM-147, ARE MORE SUITABLE THAN RADIUM. EXPERIENCE IN THE UNITED KINGDOM OF MONITORING LUMINISERS FOR RADIUM AND TRITIUM IN THEIR BODIES IS REVIEWED AND DISCUSSED IN RELATION TO THE POSSIBLE USE OF PROMETHIUM-147. PRESENT CONDITIONS IN THE LUMINISING INDUSTRY ARE SUCH THAT THERE IS A NEED FOR REGULAR MONITORING OF WORKERS, AND THE PROBLEMS CREATED BY TRITIUM AND PROMETHIUM-147 ARE SUFFICIENT TO RESTRICT THEIR USE, PROBABLY

020666 *CONTINUED*
IN FAVOUR OF RADIUM. THERE IS THUS A CONFLICT BETWEEN WHAT IS DESIRABLE FROM THE POINT OF VIEW OF THE PUBLIC AND WHAT IS PRACTISED BY THE INDUSTRY. TO RESOLVE THIS DILEMMA, IT IS SUGGESTED THAT THE METHODS EMPLOYED FOR LUMINISING SHOULD BE BROUGHT UP TO MUCH HIGHER STANDARDS FOR CONTAINING THE RADIOACTIVE COMPOUNDS.

MPBB + STRONTIUM + UNITED KINGDOM + PROMETHIUM + RADIUM + RADIATION PROTECTION, ORGANIZATION + RADIOCHEMICAL PLANT SAFETY + RADIOBIOLOGY + *CONCENTRATION + MAN

021754
DIETRICH E + KONIG LA
PROBLEMS OF RADIATION PROTECTION IN CONNECTION WITH TRITIUM
KERNFORSCHUNGSZENTRUM, KARLSRUHE, GERMANY
4 PAGES, 5 TABLES, 34 REFERENCES, ATOMPRAXIS 13(10), PAGE 454-457, (NOVEMBER 1967) IN GERMAN

PRESENTS A SURVEY ON PROBLEMS CONNECTED WITH THE SUPERVISION OF PROTECTION MEASURES CROPPING UP WITH THE USE OF TRITIUM. SOLUTIONS ARE OFFERED. A SHORT REPORT DESCRIBING TRITIUM SUPERVISION AT THE FR-2 REACTOR IS ADDED.

*RADIATION PROTECTION, ORGANIZATION + RADIATION SAFETY AND CONTROL

021935
HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1967. PART I. RADIOACTIVE WASTE DISPOSAL
OAK RIDGE NATIONAL LAB., TENN.
ORNL-4168 +. 60 PAGES, 33 FIGURES, 8 TABLES, 99 REFERENCES, PAGE 1-60, OCTOBER 1967

RESEARCH IS REPORTED ON - (1) FATE OF RADIONUCLIDES IN TERRESTRIAL ENVIRONMENT, (2) DISPOSAL BY HYDRAULIC FRACTURING, (3) DISPOSAL IN NATURAL SALT FORMATIONS, (4) APPLICATION OF MINERAL EXCHANGE TO REACTOR TECHNOLOGY, (5) ENGINEERING, ECONOMIC, AND SAFETY EVALUATIONS, (6) EARTHQUAKES AND REACTOR DESIGN, (7) DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES, AND (8) RELATED COOPERATIVE PROJECTS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

CESIUM + *ECONOMICS + KRYPTON + PLOWSHARE + SOIL, RADIONUCLIDE MOVEMENT THROUGH + *WASTE DISPOSAL, TERRESTRIAL + WASTE STORAGE + DOSE CALCULATION, INTERNAL + ORNL + WASTE DISPOSAL, GAS + WASTE MANAGEMENT + DOSE CALCULATION, EXTERNAL + CURIUM + *MINERAL EXCHANGE + SORPTION + *WASTE DISPOSAL, HYDRAULIC FRACTURING + *WASTE DISPOSAL, SALT + GEOLOGY, SALT STRUCTURE + *SAFETY EVALUATION + *EARTHQUAKE ENGINEERING + ROCK MECHANICS + VEGETATION + CONCENTRATION

021995
BUSH WR
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
AECL-2756 + CONF-670218-1 +. 17 PAGES, 6 FIGURES, 4 TABLES, 7 REFERENCES, JULY 1967, PRESENTED AT SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL, ALBUQUERQUE, N. MEX.

THE GROWTH OF THE TRITIUM (HTO) HAZARD IN THE NRU REACTOR BUILDING IS REVIEWED, AND THE METHODS AND EXPOSURE GUIDES INTRODUCED TO KEEP THE HAZARD UNDER CONTROL ARE OUTLINED. HTO INTAKES ARE CLASSIFIED AS REMOVAL, CAUTION, MINOR, OR NEGLIGIBLE, DEPENDING ON THE HTO CONCENTRATION IN URINE. REMOVAL EXPOSURES (20 MICROCURIES/LITER) ARE INVESTIGATED, AND A REPORT OF THE EXPOSURE INCIDENT IS DISTRIBUTED TO ALL BRANCHES. THE AVERAGE HTO DOSE RECEIVED IN 50 REMOVAL EXPOSURES IN 1966 WAS 230 MREM, RECEIVED MOSTLY FROM MINOR AND NEGLIGIBLE EXPOSURES. OUR LARGEST HTO EXPOSURE RESULTED IN A DOSE OF 4700 MREM, AND 19 OTHER SINGLE EXPOSURES HAVE EXCEEDED 500 MREM. MOST OF THESE RESULTED FROM INTAKE OF HTO VAPOUR THROUGH THE UNWETTED SKIN OF MEN WEARING AIR-SUPPLIED MASKS AND COTTON COVERALLS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

ADSORPTION + BIOMEDICAL + CANADA + *DOSE + *REACTOR, HWR + *DOSE CALCULATION, INTERNAL + CHALK RIVER + RADIOBIOLOGY

023261
EVANS AG
NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES
SAVANNAH RIVER LAB., E. I. DU PONT DE NEMOURS AND CO., AIKEN, S. C.
1 PAGE, ABSTRACT IN HEALTH PHYSICS 13, PAGE 931, (1967), PAPER PRESENTED AT THE TWELFTH ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY, WASHINGTON, D. C., JUNE 18-22, 1967 X

WORLD-WIDE POPULATIONS ARE CHRONICALLY EXPOSED TO TRITIUM FROM NUCLEAR WEAPONS TESTS AND RELEASES FROM NUCLEAR FACILITIES. ESTIMATES OF THE RADIATION DOSE FROM ASSIMILATION OF TRITIUM OXIDE, THE COMMON FORM OF ENVIRONMENTAL TRITIUM, ARE BASED ON THE ASSUMPTION THAT TRITIUM REMAINS IN BODY WATER UNTIL EXCRETED. ANALYSES OF DEER TISSUES, HOWEVER, INDICATE THAT CHRONIC EXPOSURE TO TRITIUM CAUSES SIGNIFICANT LABELING OF ORGANIC MOLECULES. THE DEGREE OF LABELING WAS DETERMINED FROM TRITIUM ASSAYS OF SEVEN TISSUES (HEART, LIVER, KIDNEYS, SPLEEN, BRAIN, MUSCLE AND FAT) FROM

023261 *CONTINUED*
FIFTY-TWO DEER HARVESTED ON THE SAVANNAH RIVER PLANT SITE. IN MOST TISSUES, THE TRITIUM-HYDROGEN RATIOS IN BODY WATER AND IN THE WATER OF COMBUSTION OF DRIED TISSUES WERE THE SAME. THIS INCORPORATION OF TRITIUM IN THE ORGANIC COMPONENT OF DEER TISSUES RESULTS IN DOSES UP TO 1.5 TIMES HIGHER THAN ESTIMATED IF ONLY THE TRITIUM IN BODY WATER IS CONSIDERED.

*DOSE CALCULATION, INTERNAL + SAVANNAH RIVER PLANT + ANIMAL + CONCENTRATION

024143
RARRICK HL
REVIEW OF SANDIA SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL
SANDIA CORP., ALBUQUERQUE, N. MEX.
SC-DC-67-2191 + CONF-671018-1 +. 7 PAGES, SEPT. 1967, PRESENTED AT MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, MIAMI, FLA.

TRITIUM IS NOT A RADIATION HAZARD UNLESS TAKEN INTO THE BODY, WHICH IS MOST EASILY DONE IN THE FORM OF TRITIUM WATER OR TRITIUM WATER VAPOR. ESSENTIALLY ALL TRITIUM WATER VAPOR INHALED IS RETAINED, AND AN EQUAL AMOUNT MAY BE ABSORBED THROUGH THE UNPROTECTED SKIN. THE DOSE MAY BE MEASURED IN THE URINE AND MAY BE REDUCED BY FLUID INTAKE. THE PROBLEM WITH DETECTING TRITIUM IS THAT THE RADIATION EMITTED IS SO WEAK THAT IT WILL NOT PENETRATE THE WALLS OF NORMAL DETECTION EQUIPMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

*CHALK RIVER + DOSE MEASUREMENT, INTERNAL + ENERGY LEVEL + RADIATION MONITORS

024425
BASIS HEALTH PHYSICS
DEFENSE ATOMIC SUPPORT AGENCY, ALBUQUERQUE, N. MEX.
NP-16391 +. 109 PAGES, DECEMBER 1, 1967

HEALTH PHYSICS IS DEDICATED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT FROM UNWARRANTED RADIATION EXPOSURE. THE ARTICLE, BASIC HEALTH PHYSICS, BREAKS DOWN THE SUBJECT MATTER INTO THE FOLLOWING CATEGORIES - RADIATION UNITS AND THEIR BIOLOGICAL EFFECTS, TOLERANCES, HAZARDS, DETECTION AND MEASUREMENT, RADIATION MATHEMATICS, AND PROTECTIVE EQUIPMENT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

AIRBORNE RELEASE + DOSE + HEALTH PHYSICS TRAINING + HYDROGEN + INGESTION + INHALATION + PLUTONIUM + *RADIATION DAMAGE + SURFACE CONTAMINATION + URANIUM + RADIATION UNIT + HAZARDS ANALYSIS + CONTAMINATION + X-RAY + MATHEMATICAL TREATMENT + *CONCENTRATION + *RADIATION EFFECT + MAN

025635
VENNART J
THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS
RADIOLOGICAL PROTECTION SERVICE, BELMONT, SUTTON, SURREY, ENGLAND
8 PAGES, 3 TABLES, 27 REFERENCES, HEALTH PHYSICS 14(6), PAGES 541-548 (1968)

X THE EXPERIMENTAL EVIDENCE FOR THE RBE OF BETA-PARTICLES FOR TRITIATED WATER IS REVIEWED. REPORTED VALUES ARE IN THE RANGE 1-2. THIS VARIATION IS NOT REMARKABLE IN VIEW OF THE DIFFERENT END POINTS USED BUT IT IS ALSO DUE TO EXPERIMENTAL ERRORS, TO DIFFERENT VIEWS CONCERNING THE SPATIAL DISTRIBUTION OF THE DOSE, TO THE QUALITY OF THE REFERENCE RADIATION AND TO DOSE RATE. THE RESULTS ARE REVIEWED IN RELATION TO RECOMMENDATIONS OF I.C.R.P. CONCERNING QF AND IT IS CONCLUDED THAT A VALUE OF QF DIFFERENT FROM UNITY FOR EITHER TRITIUM OR OTHER BETA-EMITTERS IS HARDLY JUSTIFIED.

*DOSE + *BETA EMITTER + *ICRP + RADIATION SAFETY AND CONTROL + ENERGY LEVEL + *RADIOLOGY

026087
INTERNAL EXPOSURE OF CHEMIST TO TRITIUM
NEW ENGLAND NUCLEAR CORP., ALBANY ST., BOSTON, MASS.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 14(25), PAGE 19, (JUNE 17, 1968)

(LETTER, MAY 8) ON APRIL 4, A JUNIOR CHEMIST WAS SYNTHESIZING AN ORGANIC COMPOUND CONTAINING TRITIUM IN A HOOD UNDER VACUUM WITH A GAS CHROMATOGRAPH. HE RECEIVED A CALCULATED INTERNAL WHOLE-BODY EXPOSURE OF 662 MREM FROM TRITIUM AND CARBON-14. EXPOSURE WAS FROM MULTIPLE CAUSES - (1) LOOSENING OF FAN BELTS, (2) PLACING HEAD IN THE HOOD, (3) POSSIBLE FATIGUE OF RUBBER TUBING AND LEAKS. A NEW FACE DESIGN FOR HOOD WILL PREVENT ENTRY OF HEAD. RUBBER TUBING WILL BE CHANGED OFTENER. CHROMATOGRAPH EXIT PORTS WILL BE DIRECTED TO THE SIDE OF HOOD RATHER THAN TO PORT.

GLOVE BOX + FAILURE, OPERATOR ERROR + *INHALATION + *VENTILATION SYSTEM + *PERSONNEL EXPOSURE, RADIATION + *RADIOISOTOPE

026493
LISTER BA
HUMAN BIOLOGY AND BIOMEDICAL RESEARCH
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
AERE-PR/HPM-12 +. 8 PAGES, PAGES 38-45, HEALTH PHYSICS AND MEDICAL DIV. PROGRESS REPORT, JAN.-DEC. 1967

REPORTS PROGRESS IN RESEARCH, AND DEALS WITH RETENTION AND METABOLISM OF INHALED METHYL IODIDE AND IODINE VAPORS. EFFORTS ARE BEING MADE TO OBTAIN BASIC INFORMATION ON THE DEPOSITION OF PARTICLES IN VARIOUS REGIONS OF THE HUMAN RESPIRATORY TRACT AND THEIR SUBSEQUENT CLEARANCE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*DEPOSITION + *INHALATION + IODINE + PLUTONIUM + IRON + *AEROSOL, RADIOACTIVE + R AND D PROGRAM + CONCENTRATION + MAN

027860
BUSH WR
ANALYSIS OF RADIATION EXPOSURES IN 1967
ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER, ONTARIO
AECL-3063 +. 16 PAGES, 8 FIGURES, 2 TABLES, MARCH, 1968

EXPOSURES TO EXTERNAL BETA AND GAMMA RADIATION AND TO INTERNAL RADIATION FROM TRITIATED WATER (HTO) ARE ANALYSED AND COMPARED WITH EXPOSURES IN PREVIOUS YEARS. THE TOTAL, AVERAGE, AND HIGHEST EXPOSURES RECEIVED AT AECL SITES IN 1967 ARE GIVEN. ABOUT 85% OF THE EXTERNAL AND 100% OF THE INTERNAL EXPOSURE WAS RECEIVED AT CRNL, OF WHICH NEARLY 10% WAS RECEIVED BY OPERATING, MAINTENANCE AND RADIATION CONTROL PERSONNEL, MOSTLY IN THE NRX AND NRU REACTOR BUILDINGS. THE COMBINED DOSES FROM EXTERNAL AND INTERNAL EXPOSURES TO THE WHOLE BODY, EYE LENSES, AND SKIN, AND THEIR DISTRIBUTION AMONG BRANCHES AND INDIVIDUALS, ARE PRESENTED IN GRAPHICAL FORM.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*DOSIMETRY + MONITOR, PERSONNEL + GROSS BETA + GROSS GAMMA + CHALK RIVER + *RADIATION SAFETY AND CONTROL + *CONCENTRATION + MAN

027868
ROHWER PS + KAYE SV
AGE-DEPENDENT MODELS FOR ESTIMATING INTERNAL DOSE IN FEASIBILITY EVALUATIONS OF PLOWSHARE EVENTS. PLOWSHARE RESEARCH AND DEVELOPMENT PROGRESS REPORT, OCTOBER 1, 1967-APRIL 1, 1968
OAK RIDGE NATIONAL LABORATORY
ORNL-TM-2229 +. 36 PAGES, FIGURES, REFERENCES, APRIL 1, 1968

PRESENTS AGE-DEPENDENT MODELS WHICH ARE USED IN THE INREM COMPUTER CODE FOR CALCULATING THE RADIATION DOSE RESULTING FROM INHALATION OR INGESTION OF RADIONUCLIDES. USE OF AGE-DEPENDENT MODELS IN FEASIBILITY STUDIES PERMITS INDENTIFICATION OF THE CRITICAL SEGMENT OF THE POPULATION AND PROVIDES THE GUIDANCE NECESSARY FOR PLANNING OF REMEDIAL ACTION. RESULTS OF EXAMPLE DOSE CALCULATIONS ARE PRESENTED FOR TRITIUM AND I-131 TO ILLUSTRATE USE OF THE INREM CODE. THE RADIONUCLIDE INPUT USED FOR THE TRITIUM EXAMPLE IS BASED ON ESTIMATED CONCENTRATIONS RELEASED TO AIR AFTER COMBUSTION OF NATURAL GAS STORED IN THE PROJECT KETCH RESERVOIR. THE I-131 EXAMPLE ILLUSTRATES THE INFLUENCE OF THE AGE-DEPENDENT PARAMETERS IN THE DOSE MODEL UPON THE RESULTING DOSE ESTIMATES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

INGESTION + *IODINE + PLOWSHARE + *DOSE CALCULATION, INTERNAL + *POPULATION EXPOSURE + *RADIATION MODEL

027977
COOLEY RC
CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS
SAVANNAH RIVER LABORATORY
DPSPU-66-30-13 + CONF-680607-1 +. 15 PAGES, TABLES, MAY 1968, FROM 13TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO

IN HEAVY-WATER-MODERATED REACTORS, TRITIUM IS FORMED AS NEUTRONS ARE ABSORBED BY THE HEAVY WATER. HAZARDS FROM TRITIUM RELEASED TO PERSONNEL ZONES DURING REPAIR AND MAINTENANCE OPERATIONS ARE MINIMIZED BY PROPER JOB EVALUATION AND SELECTION OF CORRECT PROTECTIVE EQUIPMENT. AT SAVANNAH RIVER PLANT, BASIC INFORMATION HAS BEEN DEVELOPED TO FACILITATE THIS PROCESS. DATA IS GIVEN RELATIVE TO BUILDUP OF TRITIUM IN MODERATOR, AIRBORNE CONCENTRATION OF TRITIUM, CONCENTRATION OF TRITIUM IN SPILLED MODERATOR AND WATER, ASSIMILATION OF TRITIUM BY PERSONNEL THROUGH INHALATION AND BODY CONTACT, AND DOSE RECEIVED BY URINE ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*REACTOR, HWR + INHALATION + *ANALYTICAL TECHNIQUE + HAZARDS ANALYSIS + RADIATION SAFETY AND CONTROL + SORPTION + *MONITORING SYSTEM, RADIATION + CONCENTRATION + EXCRETION, URINE + MAN

028491
HUTCHINSON WP + EAKINS JD
THE RADIOLOGICAL HAZARD FROM TRITIUM SORBED ON METAL SURFACES PART I THE SORPTION OF TRITIUM ON BRASS
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL
AERE-R 5680 +. 12 PAGES, FIGURES, TABLES, REFERENCES, APRIL 1968

A STUDY WAS MADE OF THE PARAMETERS AFFECTING THE SORPTION OF TRITIUM GAS ON BRASS AND ITS SUBSEQUENT DESORPTION. SORPTION DEPENDS ON TRITIUM PRESSURE, EXPOSURE TIME, SURFACE CHARACTERISTICS AND THE PRESENCE OF AIR. IT HAS BEEN SHOWN TO BE PREDOMINATELY A PROCESS OF ADSORPTION, FOLLOWING THE LANGMUIR ADSORPTION ISOTHERM AT LOW PRESSURES. IT IS CONCLUDED THAT FROM THE VIEW POINT OF RADIOLOGICAL PROTECTION THE RISK OF INHALATION OF SIGNIFICANT LEVELS OF TRITIUM FROM CONTAMINATED BRASS SURFACES IS MINIMAL, PROVIDED THE SURFACES HAVE NOT BEEN RECENTLY EXPOSED TO TRITIUM GAS. FURTHER STUDIES ARE BEING CARRIED OUT TO ASSESS THE HAZARD DUE TO PERCUTANEOUS ABSORPTION OF TRITIUM FROM METAL SURFACES.

AVAILABILITY - SCIENTIFIC ADMINISTRATION OFFICE, ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL, DIDCAT, BERKSHIRE, ENGLAND

*ADSORPTION + *ALLOY + METAL + *DESORPTION + SORPTION

028579
GEY A
TRITIUM AND TRITATED WATER- TIME LIMITS OF ACCIDENTAL EXPOSURE IN STABLE OR REGENERATED ATMOSPHERES (IN FRENCH)
FRANCE. COMMISSARIAT A L ENERGIE ATOMIQUE
CONF-337-46 +. 50 PAGES, FIGURES, MAY 22, 1963

X ORDINARILY, ACCIDENTAL RELEASES OF TRITIUM ARE TREATED AS THOUGH THEY ARE THE FORM OF TRITATED WATER VAPOR. THIS GIVES PESSIMISTIC ESTIMATES OF DOSES OBTAINED BECAUSE RETENTION OF TRITIUM IN THE BODY IS GREATER FOR HTO THAN FOR HT. RELEASES OF HT ARE ONLY SLOWLY OXIDIZED TO HTO SO THAT THE IMPACT OF THE RELEASE OF HT LIES SOMEWHERE BETWEEN THAT OF AN HT RELEASE WITH NO OXIDATION AND THAT OF HTO RELEASE. THIS PAPER MAKES A MATHEMATICAL TREATMENT OF THE EFFECT OF OXIDATION RATE ON THE IMPACT OF HT RELEASES.

*AIRBORNE RELEASE + CONCENTRATION, MAXIMUM + ATMOSPHERIC DIFFUSION + INGESTION + INHALATION + MPC + OXIDATION + *DOSE CALCULATION, INTERNAL + POPULATION EXPOSURE + DOSE CALCULATION, EXTERNAL + MATHEMATICAL TREATMENT

028925
DIETRICH E + KOENIG LA
PROBLEMS OF RADIATION PROTECTION IN CONNECTION WITH TRITIUM
KERNFORSCHUNGSZENTRUM, KARLSRUHE, GER.
4 PAGES. ATOMPRAXIS. 13, PAGE 454-7, (OCT. 1967), (IN GERMAN)

A SURVEY IS PRESENTED ON PROBLEMS CONNECTED WITH THE SUPERVISION OF PROTECTION MEASURES FOR THE USE OF TRITIUM, AND SOLUTIONS ARE OFFERED. A SHORT REPORT DESCRIBING TRITIUM SUPERVISION AT THE FR 2 REACTOR IS INCLUDED.

*RADIATION PROTECTION, ORGANIZATION + GERMANY + *RADIATION SAFETY AND CONTROL

029220
MAUSHART R
ACCURACY OF METHODS AND INTERPRETATION OF RESULTS OF H-3 MONITORING
KARLSRUHE NUCLEAR RESEARCH CENTRE, GERMANY
CONF-670621 +. 17 PAGES, PP. 541-557 OF RADIATION DOSE MEASUREMENTS. THEIR PURPOSE, INTERPRETATION, AND REQUIRED ACCURACY IN RADIOLOGICAL PROTECTION, PARIS, EUROPEAN NUCLEAR ENERGY AGENCY, 1967

TRITIUM IN THE HUMAN BODY CAN BE ASSESSED WITH A HIGH DEGREE OF ACCURACY BY MEASUREMENTS OF TRITIUM EXCRETED IN URINE IF THE MEASUREMENTS ARE NOT LONGER THAN SOME WEEKS AFTER THE INITIAL INTAKE AND IF THE MEASUREMENTS ARE REPEATED SUFFICIENTLY SO THAT THE HALF-TIME OF EXCRETION WILL BE KNOWN. LATER MEASUREMENTS HAVE TO TAKE INTO ACCOUNT THAT THE FRACTION OF TOTAL-BODY TRITIUM CONTAINED IN THE BODY WATER DECREASES WITH TIME.

*MONITOR, PERSONNEL + *AIR + *ANALYTICAL TECHNIQUE + *DOSE MEASUREMENT, INTERNAL + *CONCENTRATION + EXCRETION, URINE + MAN

029671
DOREMUS DR + O BRIEN MG + MERIWETHER
RAPID MONITORING OF TRITIUM AND C-14 IN URINE
MERCK AND COL. INC., RAHWAY, N.J.
3 PAGES, AMER. IND. HYG. ASS. J., 28, PAGES 488-490 (SEPT.-OCT. 1967)

GIVES A RAPID SCREENING OR MONITORING PROCEDURE FOR TRITIUM AND C-14. THIS IS UTILIZED AS A VALUABLE SUPPLEMENT TO FILM BADGES, DOSIMETERS, AND OTHER PERSONNEL MONITORING DEVICES. ANY POSSIBLE DAMAGE THAT MAY RESULT FROM ACCIDENTAL CONTACT, SPILLS, OR FAULTY LABORATORY PROCEDURES LEADING TO INTERNAL ABSORPTION CAN BE ESTIMATED FROM THIS TYPE OF ANALYSIS. A SIMPLE MIXING OF URINE AND PHOSPHOR AND MEASUREMENT IN A TYPE OF SPECTOMETER USUALLY AVAILABLE IN MOST RADIATION LABORATORIES IS ALL THAT IS NEEDED FOR THIS TEST.

*CARBON + DOSIMETRY + *MONITOR, PERSONNEL + *ANALYTICAL TECHNIQUE + *MEASUREMENT, REACTIVITY + EXCRETION, URINE

030135
HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1968
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-4316 +. 324 PAGES, OCTOBER 1968

PROGRESS OF THE HEALTH PHYSICS DIVISION AT ORNL IS REPORTED AS FOLLOWS - PART I, RADIOACTIVE WASTE DISPOSAL - (1) FATE OF TRACE ELEMENTS AND RADIONUCLIDES IN TERRESTRIAL ENVIRONMENT, (2) DISPOSAL OF HYDRAULIC FRACTURING, (3) DISPOSAL IN NATURAL SALT FORMATIONS, (4) ENGINEERING, ECONOMIC, AND SAFETY EVALUATIONS, (5) EARTHQUAKE AND REACTOR SAFETY, (6) DOSE ESTIMATION STUDIES RELATED TO PEACEFUL USES OF NUCLEAR EXPLOSIVES, (7) RELATED CO-OPERATIVE PROJECTS. PART II, RADIATION ECOLOGY. PART III, RADIATION PHYSICS. PART IV, RADIATION DOSIMETRY RESEARCH. PART V, INTERNAL DOSIMETRY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*ECOLOGY + COMPUTER PROGRAM + *DOSIMETRY + HEALTH PHYSICS TRAINING + *REACTOR SAFETY SYSTEM + *WASTE DISPOSAL, TERRESTRIAL + *WASTE DISPOSAL, ECONOMICS + DOSE CALCULATION, INTERNAL + *POPULATION EXPOSURE + *WASTE MANAGEMENT + DOSE CALCULATION, EXTERNAL + RADIATION SAFETY AND CONTROL + EARTHQUAKE + *WASTE DISPOSAL, HYDRAULIC FRACTURING + *WASTE DISPOSAL, SALT + THEORETICAL INVESTIGATION + AQUATIC ORGANISM

031061
DENHAM DH + KATHREN RL
EFFECT OF ATMOSPHERIC TRITIUM ON PHOTOGRAPHIC, THERMOLUMINESCENT AND RADIOPHOTOLUMINESCENT, DOSIMETERS
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-SA-1569 + CONF-680607-2 +. 12 PAGES, 1968, FROM 13TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO

NEITHER THE TLD NOR RPL GLASS DOSIMETERS RESPONDED TO THE TRITIUM OVER AN EXPOSURE RANGE OF 4 TO 4800 MPC-HOURS. HENCE, THESE DOSIMETERS CANNOT BE USED AS ATMOSPHERIC TRITIUM DETECTORS NOR IS PROTECTION REQUIRED IF THEY ARE WORN BY PERSONNEL IN TRITIUM CONTAMINATED ATMOSPHERES. PERSONNEL MONITORING FILM WAS AFFECTED BY ATMOSPHERIC TRITIUM WITH THE RESPONSE PER UNIT EXPOSURE BEING CONCENTRATION DEPENDENT FOR EXPOSURE TIMES BELOW ABOUT 200 HOURS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

CHAMBER, ION + MONITOR, PERSONNEL + SOLID STATE DEVICE + *ATMOSPHERIC CHEMISTRY + *HUMIDITY, RELATIVE + *DOSIMETRY, RADIOPHOTOLUMINESCENCE + *DOSIMETRY, THERMOLUMINESCENCE + *DOSIMETRY, PHOTOGRAPHIC

031065
REINIG WC + SANDERS SM
ASSESSMENT OF TRITIUM IN MAN
SAVANNAH RIVER LABORATORY
DP-MS-66-77 + CONF-670521-12 +. 16 PAGES, APRIL 17, 1967

THE CAPABILITY OF ACCURATELY EVALUATING THE RADIATION DOSE FROM TRITIUM IN MAN IS BECOMING MORE IMPORTANT BECAUSE APPLICATIONS FOR THIS RADIONUCLIDE ARE INCREASING AND UNWANTED TRITIUM IS BEING PRODUCED IN INCREASING QUANTITIES IN ALL NUCLEAR REACTORS BY TERNARY FISSION AND IN SOME BY NEUTRON CAPTURE IN HEAVY WATER MODERATOR. EMPLOYEES AT THE SAVANNAH RIVER PLANT MAY BE ACCIDENTLY EXPOSED TO TRITIUM. URINE SAMPLES ARE COLLECTED ROUTINELY TO DETERMINE THE RADIATION DOSE FROM TRITIUM ACCRUED BY THESE WORKERS TO AUDIT THE EFFECTIVENESS OF RADIOLOGICAL CONTROL PROCEDURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*INHALATION + *ANALYTICAL TECHNIQUE + *SAVANNAH RIVER PLANT + ICRP + RADIOLOGICAL ASSISTANCE + MATHEMATICAL STUDY + *CONCENTRATION + EXCRETION, URINE + MAN

031396
MAUSHART R
TRITIUM MEASUREMENTS IN RADIATION PROTECTION
KERNFORSCHUNGSZENTRUM, KARLSRUHE, GERMANY
7 PAGES, FACHZ. LAB., NO. 9, PAGES 845-52 (SEPT. 1967), IN GERMAN

TRITIUM, APART FROM THE MULTICURIE SOURCES USED IN RADIATION TECHNIQUE, IS THE MOST FREQUENTLY USED RADIOISOTOPE. DUE TO ITS LOW ENERGY (MAXIMUM ENERGY EQUALS 18 KEV), IT DEMONSTRATES SUBSTANTIAL PROBLEMS OF MEASURING TECHNIQUE. TRITIUM IS INCORPORATED AS WATER VAPOR AND WILL SHOW IN AN EXTREMELY SHORT INTERVAL IN THE BLOOD. THIS IS ONE MORE REASON WHY ITS IMPORTANCE IN RADIATION PROTECTION SHOULD NOT BE UNDERESTIMATED. APART FROM SOME SPECIFIC PROPERTIES OF TRITIUM, THE PAPER DISCUSSES SPECIAL MEASURING PROCEDURES, COMPARING THEM TO THEIR SPECIFIC APTITUDES.

*MEASUREMENT + *POPULATION EXPOSURE + RADIATION PROTECTION, ORGANIZATION + GERMANY + RADIOISOTOPE + *CONCENTRATION + MAN

031417
EVANS AG
NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES
SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA
7 PAGES, 8 FIGURES, 3 TABLES, 12 REFERENCES, HEALTH PHYSICS 16(1), PAGES 57-63 (JAN. 1968)

X ESTIMATES OF THE RADIATION DOSE FROM ASSIMILATION OF TRITIUM OXIDE, THE COMMON FORM OF ENVIRONMENTAL TRITIUM, ARE BASED ON THE ASSUMPTION THAT TRITIUM REMAINS IN BODY WATER UNTIL EXCRETED. ANALYSES OF DEER TISSUES, HOWEVER, INDICATE THAT CHRONIC EXPOSURE TO TRITIUM CAUSES SIGNIFICANT LABELING OF ORGANIC MOLECULES. THE DEGREE OF LABELING WAS DETERMINED FROM TRITIUM ASSAYS OF SEVEN TISSUES (HEART, LIVER, KIDNEY, SPLEEN, BRAIN, MUSCLE, AND FAT) FROM 52 DEER COLLECTED ON THE SAVANNAH RIVER PLANT SITE. IN MOST TISSUES, THE TRITIUM-TO-HYDROGEN RATIOS IN BOTH BODY WATER AND THE WATER OF COMBUSTION OF DRIED TISSUE RESULTS IN WHOLE BODY DOSES 1.4 TO 1.5 TIMES HIGHER THAN ESTIMATED IF ONLY TRITIUM IN BODY WATER IS CONSIDERED.

COUNTER + *DOSE + HYDROGEN + *DOSE CALCULATION, INTERNAL + SAVANNAH RIVER PLANT + *ENVIRONMENT + *ANIMAL + MAN

036557
CHISWELL WD + DAUCER GHC
MEASUREMENT OF TRITIUM CONCENTRATION IN EXHALED WATER VAPOR AS A MEANS OF ESTIMATING BODY BURDEN
UNITED KINGDOM ATOMIC AUTHORITY, AMERSHAM, ENGLAND
4 PAGES, 3 FIGURES, 2 TABLES, 5 REFERENCES, HEALTH PHYSICS, 17(2), PAGES 331-34 (AUGUST 1969)

A METHOD FOR ESTIMATING TRITIUM BODY BURDENS FROM THE TRITIUM CONCENTRATION IN EXHALED WATER VAPOUR IS DESCRIBED. IT IS SUGGESTED THAT IT MAY BE A LESS OBJECTIONABLE PROCEDURE THAN URINE SAMPLING FOR FACTORY PERSONNEL.

MPBB + MEASUREMENT + *AIR + *ANALYTICAL TECHNIQUE + DOSE MEASUREMENT, INTERNAL + *WATER VAPOR + *CONCENTRATION + MAN

037466
RAY JW
TRITIUM IN POWER REACTORS
BATTELLE MEMORIAL INSTITUTE, COLUMBUS LABORATORIES
8 PAGES, 3 FIGURES, 17 REFERENCES, REACTOR AND FUEL-PROCESSING TECHNOLOGY, 12(1), PAGES 19-26 (WINTER 1968-1969)

DISCUSSES HEALTH PHYSICS ASPECTS, PRODUCTION RATES IN POWER REACTORS, MIGRATION OF TRITIUM, AFFINITY FOR WATER, MIGRATION FROM FUEL PINS, CONTROL AND DISPOSAL. FOR A TYPICAL 1000-MW(E) REACTOR, 40 CURIES/DAY IS PRODUCED BY FISSION. FOR 1000-MW(E) PWR WITH BORON CHEMICAL SHIM, ADDITIONAL TRITIUM IS GENERATED AS A RESULT OF NEUTRON CAPTURE BY BORON. THE PRODUCTION GRADUALLY INCREASES UNTIL 16 CURIES/DAY IS PRODUCED AFTER 365 DAYS OF OPERATION.

*ACTIVITY BUILDUP + FISSION PRODUCT, VOLATILE + INGESTION + INHALATION + *WASTE DISPOSAL + REACTOR, POWER + REACTOR COOLANT + COOLANT CHEMISTRY + PERSONNEL EXPOSURE, RADIATION + CHEMICAL SHIM + MAIN COOLING SYSTEM + RADIATION EFFECT

038641
AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS
CONGRESS OF THE UNITED STATES
6 PAGES, PG 505-510 OF JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES, 1969

AT THESE HEARINGS CONCERN WAS EXPRESSED BY INTERESTED CITIZENS AS TO THE POSSIBLE ENVIRONMENTAL EFFECTS THAT MIGHT RESULT FROM ROUTINE RELEASES OF LOW LEVELS OF RADIOACTIVE HYDROGEN (TRITIUM) INTO THE BAY. THE BIOLOGICAL EFFECTS, IF ANY, OF EXPOSURES TO SUCH A LOW LEVEL WOULD BE TOO SMALL TO BE DETECTED, EVEN IF VERY LARGE POPULATIONS WERE EXPOSED, AND WOULD HAVE NO ECOLOGICAL SIGNIFICANCE. IN DERIVING LIMITS FOR TRITIUM APPLICABLE TO MEMBERS OF THE GENERAL PUBLIC, THESE EXPERT GROUPS HAVE TAKEN INTO ACCOUNT THE UNIQUE ENERGY AND ABSORPTION PROPERTIES OF TRITIUM AS THEY RELATE TO DISTRIBUTION OF THE DOSE IN BODY TISSUE.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*NRC QUESTION + ECOLOGY + REACTOR, PWR + *POPULATION EXPOSURE + *CALVERT CLIFFS 1 (PWR) + CALVERT CLIFFS 2 (PWR)

039699
AEC SEEKS TO GET RECORD STRAIGHT ON TRITIUM
2 PAGES, NUCLEAR INDUSTRIES, 16(11), PG 41-2 (NOVEMBER 1969)

COMMISSIONER LARSON DISCUSSES BIOLOGICAL ASPECTS OF TRITIUM. TRITIATED WATER IS COMPLETELY AND RAPIDLY ABSORBED BY THE GASTRO-INTESTINAL TRACT FOLLOWING INGESTION. MAXIMUM PERMISSIBLE BODY BURDEN IS ONE MCI. BIOLOGICAL HALF-LIFE OF TRITIUM IS ABOUT 10 DAYS FOR MAN. THE RELATIVE BIOLOGICAL EFFECTIVENESS FOR TRITIUM IS 1.7. NO KNOWN METHODS WHEREBY TRITIUM CAN BE CONCENTRATED THROUGH THE FOOD CHAIN.

*MPBB + *MPC + *AGENCY, AEC

040379
BASSON JK + CRAIG OK + VAN AS D + VAN DER MERWE CJ
RADIATION PROTECTION AT THE NATIONAL NUCLEAR RESEARCH CENTER, PELINDABA
ISOTOPES AND RADIATION DIVISION, ATOMIC ENERGY BOARD, PELINDABA, TVL
7 PAGES, 3 TABLES, 18 REFERENCES, SOUTH AFRICAN MEDICAL JOURNAL, VOL. 43, PAGES 1181-7 (SEPTEMBER 27, 1969)

THE ORGANIZATION AND RESULTS OF RADIATION PROTECTION AND CONTROL AT THE NATIONAL NUCLEAR RESEARCH CENTRE, PELINDABA, WHICH IS THE RESEARCH INSTITUTE OF THE SOUTH AFRICAN ATOMIC ENERGY BOARD, ARE DESCRIBED.

*CODES AND STANDARDS + URANIUM + RADIATION PROTECTION, ORGANIZATION + ICRP + *RADIATION SAFETY AND CONTROL + *SOUTH AFRICA + X-RAY + MONITOR, AREA + DOSIMETRY, CLINICAL + THERAPY

040785
FEINENDEGEN LE
TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS
4 PAGES, PP. 338-41 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

TRITIUM-LABELED LEUCINE, PROLINE, AND HISTIDINE WERE LESS TOXIC IN ESCHERICHIA COLI THAN H3-NUCLEOSIDES AND LED TO A KILLING EFFICIENCY OF APPROXIMATELY ONE-HALF THE VALUE OBTAINED FOR H3-URIDINE AND H3-THYMIDINE. STUDIES ON RELATIVE TOXICITY OF H3-CYTIDINE AND H3-THYMIDINE IN HELA CELLS IN CULTURE SHOWED THAT UP TO 0.1 MICROCURIE OF H3-CYTIDINE PER MILLILITER OF MEDIUM HAD NO SIGNIFICANT EFFECT ON VIABILITY, WHILE THE SAME DOSE OF H3-THYMIDINE DEPRESSED SUVIVAL TO 19.8 PERCENT.

BACTERIA + TOXICITY + AMINO ACID + CELL, NUCLEUS + CULTURE + PROTEIN

040787
FEINENDEGEN LE
TRANSMUTATION EFFECT
2 PAGES, PP. 341-2 OF TRITIUM-LABELED MOLECULES IN BIOLOGY AND MEDICINE, NEW YORK AND LONDON, ACADEMIC PRESS, 1967

WHEN THE CHROMOSOME OF EXCHERICHIA COLI WAS LABELED WITH H-3 THYMIDINE, VIABILITY LOSSES CORRESPONDED TO AN INCREASING NUMBER OF TRITIUM DISINTEGRATIONS, ALTHOUGH ENZYME FORMATION WAS NOT AFFECTED. THE EFFECT OF TRITIUM ON THE REVERSION OF ARGININE DEPENDENCE OF E. COLI WAS INVESTIGATED. TRITIUM BOUND MAINLY TO RNA WAS SIGNIFICANTLY MORE EFFECTIVE IN YIELDING REVERTED MUTANTS AMONG THE SURVIVORS THAN WAS TRITIUM BOUND TO DNA OR PROTEIN. TRANSMUTATION EFFECTS ARE CONSIDERED EXPRESSIONS OF LOCALIZED MOLECULAR REACTIONS INSUFFICIENT FOR CAUSING DEATH BUT CAPABLE OF INDUCING MUTATIONS - THEREFORE THEY SHOULD BECOME RECOGNIZABLE IN CELLS OF HIGHER ORGANISMS WITH PROPER GENETIC TECHNIQUES.

BACTERIA + EFFECT, GENETIC + RADIATION EFFECT + DNA + ENZYME + MUTATION + PROTEIN + RNA

041584
KAYE SV + ROHWER PS
METHODS OF ESTIMATING POPULATION EXPOSURES FROM PLOWSHARE APPLICATIONS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
34 PAGES, 6 FIGURES, 3 TABLES, PP. 551-584 OF THE PROCEEDINGS OF THE SYMPOSIUM ON PUBLIC HEALTH ASPECTS OF PEACEFUL USES OF NUCLEAR EXPLOSIVES, APRIL 7-11, 1969

A COMPUTER CODE CALLED INREM HAS BEEN WRITTEN WHICH CAN CONSIDER ALL INTERNAL DOSE PARAMETERS AS A FUNCTION OF AGE. THE MAJOR LIMITATION IN USING THIS COMPUTER CODE FOR ALL RADIONUCLIDES IS THE PAUCITY OF AGE-DEPENDENT INPUT DATA FOR MANY RADIONUCLIDES. TRITIUM, IODINE, CESIUM, AND STRONTIUM HAVE BEEN STUDIED IN DETAIL WITH INREM AND THE RESULTS AND INTERPRETATIONS ARE DISCUSSED. EXREM COMPUTES THE EXTERNAL DOSE RATES AND CUMULATIVE DOSES FROM BOTH BETA PARTICLES AND GAMMA PHOTONS FROM SUBMERSION IN A RADIOACTIVE CLOUD, SUBMERSION IN CONTAMINATED WATER AND EXPOSURE ABOVE A CONTAMINATED LAND SURFACE. THIS CODE CAN CONSIDER UP TO 25 PLOWSHARE DETONATIONS. THE IMPORTANCE OF USING BOTH INREM AND EXREM TO ESTIMATE THE TOTAL DOSE TO A POPULATION GROUP IS STRESSED.

AVAILABILITY - S. V. KAYE, OAK RIDGE NATIONAL LABORATORY, P.O. BOX Y, OAK RIDGE, TENNESSEE 37830

CESIUM + COMPUTER PROGRAM + PLOWSHARE + STRONTIUM + DOSE CALCULATION, INTERNAL + NUCLEAR DETONATION + *POPULATION EXPOSURE + MODEL + *RADIATION EXPOSURE, CHRONIC

041900
OCKEY CH
CHROMATID ABERATIONS RESULTING FROM 3H-THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS
CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE, MANCHESTER, ENG.
6 PAGES, INTERNATIONAL JOURNAL OF RADIATION BIOLOGY, VOL. 13, PAGES 479-84 (1967)

CHROMATID ABERRATIONS WERE INDUCED BY H(3)-THYMIDINE INCORPORATED IN EARLY AND LATE S PERIODS OF HUMAN XY, XXY, AND XX CELLS. AT SIMILAR TOTAL H-3 DISINTEGRATIONS, LATE S CELLS WERE FOUR TIMES (XY) OR SEVEN TIMES (XXY) MORE SENSITIVE THAN EARLY S CELLS. THIS DIFFERENCE IS PARTLY ATTRIBUTABLE TO DOSE-RATE DIFFERENCES BETWEEN SAMPLES. LOCALIZATION PRODUCES AN INTRANUCLEAR

041900 *CONTINUED*
DOSE-RATE EFFECT DEMONSTRATED BY THE CONCENTRATION OF ABERRATIONS TO LATE-LABELLING CHROMOSOMES, PARTICULARLY THE LATE X. ANY ATTEMPT AT COMPARING STAGE SENSITIVITY MUST BE CARRIED OUT AT AN INTRACHROMOSOMAL LEVEL.

*CHROMOSOMAL EFFECT + RADIATION EFFECT + CELL, STEM + MAN

042771
CSBORNE RV
INTAKE OF TRITIUM WHEN SKIN IS SPLASHED WITH TRITIATED WATER
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
2 PAGES, HEALTH PHYSICS, VOL. 15, PAGES 155-6 (AUGUST 1968)

X WHERE THE SKIN IS WET WITH TRITIATED WATER THE INTAKE RATE PER UNIT AREA IS EQUAL TO THAT FROM A TRITIATED WATER VAPOUR CONCENTRATION SATURATING THE AIR AT THE SKIN TEMPERATURE. THIS INTAKE RATE PER UNIT AREA MAY BE ONLY A FEW TIMES THAT FROM AIR CONTAMINATION IF THE LOCAL AIR SPACE IS HOT AND NOT WELL VENTILATED, SINCE HIGH HEAVY WATER HUMIDITIES MAY BE REACHED IN SUCH PLACES. IN THESE CONDITIONS THE GREATER HAZARD MAY WELL BE THE AIR CONTAMINATION. A CALCULATION IS GIVEN, WHICH ALSO TAKES INTO ACCOUNT THE BLOTTER EFFECT, ILLUSTRATING THIS.

*WATER + AIR + DOSE CALCULATION, EXTERNAL + *CONTAMINATION + ABSORPTION + CONCENTRATION + *INTAKE + *SKIN

043091
MOSKALEV YI
DISTRIBUTION AND BIOLOGICAL EFFECTS OF RADIOACTIVE ISOTOPES
575 PAGES, MOSCOW, ATOMIZDAT, 1966

X FACTORS ENHANCING OR REDUCING THE BUILD-UP OF ISOTOPES IN VARIOUS ORGANS OF THE BODY ARE ANALYZED. IT IS SHOWN THAT FUNCTIONAL SHIFTS IN VARIOUS SYSTEMS MAY ARISE EVEN EARLIER THAN IN THE CRITICAL ORGANS. THE ROLE OF ADDITIONAL PATHOLOGICAL FACTORS IN THE LONG-TERM CONSEQUENCES OF POISONING WITH RADIOISOTOPES IS EXAMINED, AS IS THE EFFECT OF RADIOISOTOPES ON FERTILITY AND THE GROWTH OF OFFSPRING. SPECIAL ATTENTION IS PAID TO THE BIOLOGICAL EFFECT OF TRITIUM OXIDE AND PO(210). THE RESULTS OF RESEARCH INTO WAYS AND MEANS OF ACCELERATING THE ELIMINATION OF RADIOISOTOPES BY THE ORGANISM AND REDUCING THEIR ABSORPTION FROM THE GASTROINTESTINAL TRACT ARE PRESENTED.

DOSIMETRY + *OXIDE + *MPD + *POLONIUM + *RADIOISOTOPE + ABSORPTION + CONCENTRATION + EFFECT, GENETIC + DISTRIBUTION + THERAPY + *RADIATION EFFECT + ELIMINATION + GI TRACT + MAN

043100
SHTUKKENBERG YM + ZHURAVLEV VF
THE MAXIMUM PERMISSIBLE CONCENTRATION OF GASEOUS TRITIUM IN THE AIR OF INDUSTRIAL PREMISES
INSTITUTE OF BIOPHYSICS, MOSCOW
5 PAGES, GIGIENA I SANITARIYA, NO. 8, PG 44-48 (AUGUST 1968) (IN RUSSIAN)

X THE PENETRATION OF GASEOUS TRITIUM THROUGH THE SKIN AND THE RESPIRATORY ORGANS AND THE PERIODS OF HALF-ELIMINATION OF THE ISOTOPE FROM THE BODY OF RATS AFTER ITS INHALATION ARE DISCUSSED. VALUES FOR THE MAXIMUM PERMISSIBLE CONCENTRATION OF GASEOUS TRITIUM IN THE AIR OF INDUSTRIAL PREMISES ARE RECOMMENDED.

*MPC + *AIR + INDUSTRIAL SAFETY + RESPIRATION + ELIMINATION + EXPOSURE, ACUTE + SKIN + MAMMAL, RODENT

043103
SIRI W + EVERS J
TRITIUM EXCHANGE IN BIOLOGICAL SYSTEMS
UNIVERSITY OF CALIFORNIA, BERKELEY
14 PAGES, PAGES 71-84 OF TRITIUM IN THE PHYSICAL AND BIOLOGICAL SCIENCES, VOL. II, VIENNA, IAEA, 1962

WHENEVER TRITIUM-LABELED WATER IS EMPLOYED AS A TEST SOLUTE OR TRACER IN BIOLOGICAL SYSTEMS, AN APPRECIABLE EXCHANGE BETWEEN TRITIUM AND LABILE HYDROGEN ATOMS OCCURS THAT FREQUENTLY AFFECTS THE NATURE AND INTERPRETATION OF EXPERIMENTAL RESULTS. THE STUDIES REPORTED ARE CONCERNED WITH THE MAGNITUDE OF THE EFFECT THAT TRITIUM EXCHANGE INTRODUCES INTO MEASUREMENTS OF TOTAL BODY WATER AND WATER METABOLISM IN ANIMALS AND HUMANS.

HEAVY WATER + TRACER, RADIOACTIVE + *WATER + EXPERIMENT + *RADIOBIOLOGY + CONCENTRATION + BLOOD + *RADIATION EFFECT + *TURNOVER RATE + MAMMAL, SMALL + EXPOSURE, IV + LIVESTOCK + *WHOLE BODY

043122
CHASSANY J + ROUX JM
HEALTH PHYSICS PROBLEMS DUE TO TRITIUM AROUND HEAVY-WATER REACTORS
COMMISSARIAT A L/ENERGIE ATOMIQUE, CHUSCLAN (FRANCE)
CEA-R-3874 +. 24 PAGES, 13 TABLES, DECEMBER 1969

A REVIEW IS MADE, AFTER ONE YEAR OPERATION, OF THE PROTECTION AGAINST TRITIUM IN A HEAVY-WATER REACTOR - NATURE OF THE TRITIUM RISK (PARTICULARLY TO THIS TYPE OF INSTALLATION), DETECTION AND MEASUREMENT EQUIPMENT, WORKING METHOD, RESULTS OBTAINED CONCERNING THE SUPERVISION OF THE PERSONNEL, THE INSTALLATION, AND THE SERVICING OPERATION.

043122 *CONTINUED*
AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATICN, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*HEAVY WATER + RADIATION IN PERSPECTIVE + SAFETY REVIEW + *RADIATION SAFETY AND CONTROL + *REACTOR + EQUIPMENT + OPERATING EXPERIENCE

043153
INTERNAL DOSE ESTIMATION
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-3697 +. 5 PAGES, PG 173-7, MARCH 15, 1965

THE RETENTION OF HTO BY AN EMPLOYEE EXPOSED IN THE COURSE OF HIS WORK IS STUDIED. THE RETENTION IS CLOSELY APPROXIMATED BY THE SUM OF TWO EXPONENTIALS, ONE SHOWING AN ELIMINATION HALF-TIME OF ABOUT 9 DAYS AND THE OTHER ABOUT 37 DAYS. ALTHOUGH MULTIEXPONENTIAL RETENTION FUNCTIONS WERE OBSERVED IN ANIMALS, THIS IS THE FIRST DIRECT OBSERVATION OF SUCH A RETENTION IN MAN. HOWEVER, INDIRECT EVIDENCE WAS REPORTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

INCIDENT, EXPOSURE + HEAVY WATER + *RADIONUCLIDE UPTAKE + BIOLOGICAL HALF-LIFE + ELIMINATION + EXPOSURE, ACUTE

043197
PLAMONDON JE + BASSHAM JA
DETERMINATION OF BODY WATER IN HUMANS WITH THE AID OF TRITIUM
DEUTSCHE HOCHSCHULE FUR KOERPERKULTUR, LEIPZIG
5 PAGES, ARCHIV FUER DIE GESAMTE PHYSIOLOGIE DES MENSCHEN UND DER TIERE, PFLUEGERS, VOL. 281, PG 374-378 (1964)(IN GERMAN)

BODY WATER IN HUMANS WAS MEASURED BY COMPARISON OF H-3 SPECIFIC ACTIVITY IN EXPIRED AIR, SERUM, AND URINE SAMPLES AFTER ORAL ADMINISTRATION OF H(3)2O. OTHER MEASUREMENTS SHOWED THAT THE CONCENTRATION OF H-3 IN EXPIRED AIR WAS A SENSITIVE MEASURE OF BODY WATER CHANGES.

DOSIMETRY + HEAVY WATER + *MEASUREMENT + WATER + EXPERIMENT + *CONCENTRATION + *EXCRETION + DOSIMETRY, CLINICAL + *BLOOD, SERUM + WHOLE BODY

043213
PENELLE G + CORBISIER O
TRITIUM LABORATORY - STUDY OF THE MAXIMUM POSSIBLE ACCIDENT
CENTREO/ETUDE DE L/ENERGINE NUCLEAIRE, BRUSSELS (BELGIUM)
BLG-280 +. 9 PAGES, JULY 1964

IN THE CASE OF THE TRITIUM LABORATORY THE MAXIMUM CREDIBLE ACCIDENT IS DEFINED AS A FIRE THAT OWULD DESTROY THE DIFFERENT ROOMS AND RELEASE TO THE ATMOSPHERE ALL THE TRITIUM CONTAINED IN THE LABORATORY. THE QUANTITY OF TRITIUM SUPPOSED TO BE IN THE LABORATORY WHEN THE FIRE STARTS IS THE MAXIMUM FORESEEABLE QUANTITY WITH RESPECT TO THE EXISTING INSTALLATIONS. THE DOSES BY DIRECT RADIATION FROM THE RADIOACTIVE CLOUD AND THE INHALATION DOSES WERE CALCULATED AND FOUND TO BE SMALLER THAN THE CORRESPONDING GUIDE-LEVELS.

FIRE + INHALATION + *ACCIDENT, MAXIMUM CREDIBLE (MCA) + *ATMOSPHERIC POLLUTION + *ACCIDENT, HYPOTHETICAL + DOSE CALCULATION, EXTERNAL + RADIOACTIVITY RELEASE

043246
MOSER MH + ROBINSON DW + SCHLOERG PR
TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS
UNIVERSITY OF KANSAS
5 PAGES, SURGERY, GYNECOLOGY AND OBSTETRICS, VOL. 118, PG 984-988 (MAY 1964)

THE TRANSFER OF H(3)2O, NA-22, AND CL36 ACROSS BURNED SKIN WAS STUDIED IN 19 PATIENTS. SOLUTIONS OF THE RADIOISOTOPES WERE APPLIED DIRECTLY TO THE SKIN AND LOCAL LOSS OF RADIOACTIVITY WAS MEASURED. ABSORPTION OF ALL THREE ISOTOPES FROM THE SOLUTION EXPOSED TO THE BURN GRANULATION TISSUE WAS RAPID, RANGING FROM 11 TO 56 PERCENT IN 30 MIN. RESULTS INDICATED THAT WATER WAS TRANSFERRED FROM THE GRANULATING TISSUE SURFACE AT NEARLY THE SAME RATE AT WHICH IT WAS ABSORBED. DATA SHOW LARGE TRANSFERS OF WATER AND ELECTROLYTE ACROSS BURNED TISSUE, THAT ABSORPTION IS CONCENTRATION DEPENDENT AND SUGGEST THAT A MORE PHYSIOLOGIC SOLUTION SHOULD HAVE ELECTROLYTIC CONCENTRATIONS APPROXIMATING THOSE OF THE EXTRACELLULAR FLUID.

SODIUM + *WATER + CHLORINE + ABSORPTION + CONCENTRATION + *RADIONUCLIDE TRANSFER + RADIATION EXPOSURE, ACUTE + DOSIMETRY, CLINICAL

043273
BUTLER HL + LEROY JH
OBSERVATIONS OF BIOLOGICAL HALF LIFE OF TRITIUM
DU PONT DE NEMOURS (E.I.) AND COMPANY, SAVANNAH RIVER PLANT, S.C.
DPSPU-64-30-9 + CONF-642-24 +. 9 PAGES, MAY 1964, FROM HEALTH PHYSICS SOCIETY MEETING, CINCINNATI, JUNE 1964 X

043273 *CONTINUED*
OVER THE PAST TEN YEARS 309,000 URINE SAMPLES WERE RADIOASSAYED FOR TRITIUM. MOST OF THE SAMPLES WERE ANALYZED USING A LIQUID SCINTILLATION COUNTING TECHNIQUE. IN 310 CASES THE TRITIUM CONCENTRATION IN URINE WAS AT LEAST 20 MICROCURIES/LITER. THE BIOLOGICAL HALF LIFE VALUES FOR THESE CASES RANGED FROM 4 TO 18 DAYS, WITH AN AVERAGE OF 9.5 +- 4.1 DAYS (90 PERCENT CONFIDENCE LEVEL). DATA SHOWED NO CORRELATION BETWEEN THE AMOUNT ASSIMILATED AND BIOLOGICAL HALF LIFE. A TREND TOWARD A SHORTER HALF LIFE WAS OBSERVED FOR INCREASING AGE.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

COUNTER + *ANALYTICAL TECHNIQUE + WATER, DRINKING + ASSIMILATION + *BIOLOGICAL HALF-LIFE + *CONCENTRATION + TEMPERATURE + EFFECT, AGE + *EXCRETION, URINE

043306
GROOT-WESSELDIJK A
EXPERIENCE WITH THE USE OF RADIOACTIVE HYDROGEN IN INDUSTRY
PHILIPS GLOEILAMPENFABRIEKEN, N.V., EINDHOVEN, NETHERLANDS
4 PAGES, TIJDSCHRIFT SOCIALE GENEESKUNDE, VOL. 42, PG 854-7 (1964)

WHEN IT WAS NECESSARY TO USE A RADIOACTIVE SUBSTANCE IN THE MASS PRODUCTION OF A CERTAIN TYPE OF RADIO TUBES THE HYDROGEN ISOTOPE TRITIUM (H-3) WAS CHOSEN. PREFERENCE WAS GIVEN TO TRITIUM AS A GAS AND NOT IN A CHEMICAL COMBINATION. IN CASE THE GAS IS ACCIDENTALLY INHALED IT IS NOT DEPOSITED IN AN ORGAN OR TISSUE. INSTEAD THE TRITIUM IS DISSOLVED IN THE BODY FLUIDS AND RAPIDLY EXCRETED BY THE KIDNEYS. OCCASIONALLY SMALL AMOUNTS OF TRITIUM WERE FOUND IN THE URINE OF MEN WORKING WITH THE ISOTOPE.

DEPOSITION + INHALATION + *GAS + INDUSTRIAL SAFETY + TELEVISION + EXCRETION, URINE + BODY FLUID

043571
THIE JA
ELK RIVER REACTOR SYSTEM MONITORING DATA
ARGONNE NATIONAL LABORATORY, ILLINOIS
COO-651-49 +. 64 PAGES, JUNE 30, 1967

PRESENTS IN-PLANT MONITORING DATA FOR THE ELK RIVER REACTOR FOR PERIOD JULY 1, 1966 THROUGH JUNE 30, 1967.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*CONTAINMENT + EFFLUENT + *ELK RIVER (BWR) + FUEL INTEGRITY + TESTING + SAMPLING + SURVEY, RADIATION + *RADIATION SAFETY AND CONTROL + SYSTEM DESCRIPTION + *SAFETY ANALYSIS + OPERATING EXPERIENCE

043593
RICHMOND CR + LANGHAM WH + TRUJILLO TT
COMPARATIVE METABOLISM OF TRITIATED WATER BY MAMMALS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
9 PAGES, 3 FIGURES, REFERENCES, JOURNAL OF CELLULAR AND COMPARATIVE PHYSIOLOGY, VOL. 59, PG. 45-53 (JUNE 1962)

TRITIATED WATER WAS USED TO MEASURE THE VOLUME AND TURNOVER OF EXCHANGEABLE BODY WATER IN 7 SPECIES OF ADULT MAMMALS. USING THESE PARAMETERS, THE DAILY TURNOVER OF EXCHANGEABLE BODY WATER WAS CALCULATED FOR EACH SPECIES. AN INTERSPECIES CORRELATION OF THE POWER FUNCTION TYPE BETWEEN DAILY WATER TURNOVER AND SPECIES WEIGHT WAS ESTABLISHED. A PARABOLIC INTERSPECIES CORRELATION WAS ALSO ESTABLISHED BETWEEN TOTAL BODY WATER AND TOTAL BODY SOLIDS FOR THE 7 SPECIES.

*HEAVY WATER + *WATER + RADIONUCLIDE UPTAKE + CONCENTRATION + TURNOVER RATE + MAMMAL, SMALL + MAMMAL, LARGE + RETENTION + *WHOLE BODY

043979
RADFORD EP
ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD
6 PAGES, ATOMIC ENERGY CLEARING HOUSE, 16(5), PG 25-30 (FEBRUARY 2, 1970)

SPEAKER DEVELOPS A SCHOLARLY PRESENTATION OF POTENTIAL EFFECTS OF TRITIUM RELEASES. HE POINTS OUT THAT MOST SERIOUS SOURCE WOULD BE FROM FUEL REPROCESSING PLANTS, ALTHOUGH RELEASES TO WATER (CHESAPEAKE BAY) CAN BE HIGHLY SIGNIFICANT. ASSUMING THE AEC ACCEPTS THE LINEAR-DOSE-RESPONSE, NONTHRESHOLD, AND MAXIMUM-PERMISSIBLE-CONCENTRATION CONCEPTS, THEN HE HAS FIGURES TO SHOW POTENTIAL POPULATION MUTAGENIC EFFECTS (SPERM AND OVA). HE DIVIDES DOSES DUE TO VARIOUS RADIATION SOURCES PERCENTAGEWISE. IN ADDITION HE STATES HIS CONSIDERED ACCEPTABLE GENETIC RISK FROM TRITIUM. FROM THESE HE DEVELOPS HIS THESIS. HENCE, MANKIND MUST BE PREPARED TO ACCEPT CERTAIN RISKS, AND THE AEC WOULD SERVE BEST IF IT AWAKENS PUBLIC TO THEIR RESPONSIBILITIES FOR TACKLING THE WHOLE RANGE OF ENVIRONMENTAL PROBLEMS. DECISIONS MADE NOW CAN INFLUENCE GENERATIONS TO COME FOR CENTURIES.

CRUSTACEAN + CESIUM + CODES AND STANDARDS + CONGRESSIONAL ACTIVITY + FRC + KRYPTON + STRONTIUM + *REACTOR, POWER + ICRP + NCRP + RADIOACTIVITY RELEASE + WATER POLLUTION + FUEL REPROCESSING + CALVERT CLIFFS 1 (PWR) + DATA COLLECTION + FOOD CHAIN + AQUATIC ORGANISM + EFFECT, GENETIC + (TAMPLIN A) + INDUSTRY, NUCLEAR + BIOLOGICAL CONTROL + OPPONENT + *SOCIO/PHILOSOPHICAL CONSIDERATION

044015
BOND VP
ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS - TESTIMONY BEFORE JCAE BY VICTOR P. BOND
8 PAGES, ATOMIC ENERGY CLEARING HOUSE, 16(5), PG 30-37 (FEBRUARY 2, 1970)

BOND SUMMARIZES THE POSSIBLE BIOLOGICAL EFFECTS OF TRITIUM FROM THEORETICAL AND EXPERIMENTAL STANDPOINTS. FACTORS THAT MIGHT INCREASE THE DEGREE OF TOXICITY OVER THAT EXPECTED FROM ABSORBED DOSE ARE - (1) POSSIBILITY OF TRITIUM CONCENTRATION, (2) INCORPORATION INTO BIOLOGICAL MOLECULES, E.G., DNA. HE CONCLUDES THESE FACTORS DO NOT SIGNIFICANTLY INCREASE THE DOSE EXPECTED FROM A GIVEN CONCENTRATION OF TRITIUM IN THE ENVIRONMENT. TRITIUM HAS SAME RADIOBIOLOGICAL AND RADIATION PROTECTION MEANING AS SAME DOSE FROM X OR GAMMA RAYS, AND NO ADDED HAZARD SHOULD BE ATTACHED BECAUSE DOSE HAS BEEN DERIVED FROM TRITIUM.

CONGRESSIONAL ACTIVITY + MPC + RADIATION IN PERSPECTIVE + *ICRP + NCRP + REACTOR POWER + RADIOACTIVITY RELEASE + DATA COLLECTION + CONCENTRATION + *EFFECT, GENETIC + DNA + *BIOLOGICAL CONTROL + N-POWER, SAFETY OF + PROPONENT + SPOKESMAN, AEC

044109
CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.
BALTIMORE GAS AND ELECTRIC COMPANY
1 PAGE, THE WASHINGTON POST, SEPTEMBER 3, 1969

A PROMOTIONAL ADVERTISEMENT BY BGE CO. DEVOTED PRINCIPALLY TO INNOCUOUSNESS OF TRITIUM, VIZ. (1) CHESAPEAKE BAY WATER NOT DRINKABLE BECAUSE SALT WATER, (2) TO ACCUMULATE SO MUCH AS TO ACQUIRE SAME RELATIVE DOSE AS CHEST X-RAY, INDIVIDUAL WOULD NEED TO EAT 30 TONS FISH, CRABS, CLAMS AND OYSTERS, (3) NO BIOLOGICAL BUILDUP BECAUSE OF EXCHANGE MECHANISM, (4) EXPOSURE TO INDIVIDUAL IN SITE VICINITY WILL BE 0.0002 MILLIREM. ALSO, $4.4 MILLION PROCESSING SYSTEM INSTALLED TO REMOVE 99.999 PERCENT OF MOST NUCLIDES AND 97 PERCENT OF THE FEW REMAINING (EXCEPT TRITIUM).

FISSION PRODUCT RELEASE + *RADIATION IN PERSPECTIVE + REACTOR POWER + RADIOACTIVITY RELEASE + *CALVERT CLIFFS 1 (PWR) + *ENVIRONMENTAL CONTROL MEASURE + FOOD CHAIN + N-POWER, SAFETY OF + PROPONENT + SPOKESMAN, UTILITY

044224
PINSON EA + LANGHAM WH
PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN
UNIVERSITY OF CALIFORNIA, LOS ALAMOS SCIENTIFIC LABORATORY
19 PAGES, 16 FIGURES, 10 TABLES, 32 REFERENCES, JOURNAL OF APPLIED PHYSIOLOGY, 10(1), PP. 108-26 (JANUARY 1957)

USING TRITIUM WATER AS A TRACER IN MAN, WATER ABSORPTION THROUGH THE GASTROINTESTINAL TRACT BEGIN IN 2-9 MINUTES AND WAS COMPLETE IN 40-45 MINUTES. FOR VOLUME OF WATER TRANSFERRED FROM THE INTESTINE TO THE BLOOD WAS LINEAR WITH TIME AND PROPORTIONAL TO THE VOLUME OF WATER INGESTED, WITHIN THE RANGE OF 100-1000 ML. WHEN EXPOSED TO HTO VAPOR VIA INHALATION, MAN ABSORBED THROUGH THE RESPIRATORY SYSTEM 98-99 PERCENT OF THE ACTIVITY INSPIRED. THE ACTIVITY IN VENOUS BLOOD INCREASED SHARPLY DURING AND SHORTLY AFTER INHALATION EXPOSURE, AFTER WHICH IT DECLINED EXPONENTIALLY TO EQUILBRIUM WITH A HALF-TIME OF ABOUT 12 MINUTES.

INGESTION + INHALATION + *TRACER, RADIOACTIVE + TRANSFER FUNCTION + *WATER + *ABSORPTION + *EQUILIBRIUM + *BIOLOGICAL HALF-LIFE + BLOOD + TURNOVER RATE + EXPOSURE, SKIN + GI TRACT

044471
LARSON CE
ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS
U.S. ATOMIC ENERGY COMMISSION
38 PAGES, PG 238-275 OF THE HEARINGS BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY, CONGRESS OF THE UNITED STATES, NINETY-FIRST CONGRESS, FIRST SESSION, OCTOBER 28-31, NOVEMBER 4-6, 1969

STATEMENT OF C. E. LARSON, AEC COMMISSIONER ON ENVIRONMENTAL EFFECTS. RADIATION EFFECTS ARE EQUIVALENT TO JET-PLANE FLIGHT ONCE A YEAR. MICE STUDIES AT ORNL AT MUCH HIGHER IRRADIATION LEVELS SHOW VERY SMALL EFFECTS. EFFECTS AT ALLOWABLE LEVELS SO SMALL AS TO BE UNDETECTABLE BY PRESENT TECHNIQUES. GIVES DETAILS OF TYPES AND EFFORTS OF STUDIES ON ENVIRONMENTAL EFFECTS. INCLUDES RADIONUCLIDE CYCLING, SOMATIC AND GENETIC EFFECTS, TRITIUM, KRYPTON-85, THERMAL EFFECTS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*ECOLOGY + EFFLUENT + KRYPTON + REACTOR + THERMAL POLLUTION + *RADIONUCLIDE UPTAKE + FOOD CHAIN

044674
JUNKINS RL
BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
CONF-690303 +. 11 PAGES, PP. 133-43 OF THE PROCEEDINGS OF A SYMPOSIUM ON BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE, LIVERMORE, CALIFORNIA, MARCH 5-7, 1969

THE RELEASES OF RADIONUCLIDES FROM REACTORS AND THE ENVIRONMENTAL EFFECTS OF THESE RELEASES HAVE BEEN STUDIED SINCE THE EARLY 1940S. CONTROLS BASED ON THE KNOWLEDGE GAINED FROM THESE STUDIES HAVE BEEN ADEQUATE TO MAINTAIN THE RADIATION EXPOSURE OF THE PUBLIC WELL WITHIN ACCEPTABLE LIMITS. THE SIGNIFICANT PATHWAYS OF EXPOSURE HAVE BEEN IDENTIFIED. OVER THE YEARS IMPROVED METHODS OF WASTE TREATMENT AND CONTAINMENT TECHNOLOGY FOR REACTORS HAVE EVOLVED TO THE POINT

044674 *CONTINUED*
WHERE RELEASE OF WASTE HEAT FROM POWER REACTORS NOW APPEAR TO BE RECEIVING MORE PUBLIC ATTENTION THAN THE RELEASE OF RADIONUCLIDES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIOMEDICAL + ECOLOGY + FALLOUT + WASTE TREATMENT + CONTAINMENT R AND D + SAVANNAH RIVER PLANT + CHALK RIVER + RADIOISOTOPE + ENVIRONMENT + HANFORD SITE + *REACTOR, PRODUCTION + *RADIONUCLIDE TRANSFER

045018
HULL A
ANDREW HULL ON KRYPTON, TRITIUM
ATOMIC INDUSTRIAL FORUM, INC.
1 PAGE, INFO ISSUE NO. 27 (SUPPLEMENT), PG 5 (MAY 1970)

THE SUPV. OF ENVIRONMENTAL MONITORING OF BNL DISCUSSED NUCLIDES OF CONCERN IN THE ENVIRONMENTAL ASPECTS OF NUCLEAR POWER OPERATIONS -- PRIMARILY TRITIUM AND KRYPTON. TRITIUM APPEARS TO BE ONE OF GREATEST CONCERN. IF TEN 1000 MEGAWATT (E) PRESSURIZED WATER REACTORS EACH DISCHARGED 3000 CI/YR INTO LONG ISLAND SOUND, A PERSON DERIVING HIS ENTIRE FOOD SUPPLY FROM AQUATIC ORGANISMS IN THE SOUND WOULD RECEIVE A DOSE OF 0.00007 REM/YR. HE STATES THAT THE LOW LEVELS OF RADIATION ASSOCIATED WITH ROUTINE RELEASES FROM REACTORS ARE NOT DEMONSTRATABLE BUT ARE RATHER AN INFERRED PROBABILITY FROM OBSERVED HIGH-LEVEL, DOSE-EFFECT RATIOS.

DOSE + FISSION GAS RELEASE + FISSION PRODUCT RELEASE + KRYPTON + *REACTOR, POWER + *RADIOACTIVITY RELEASE + WATER POLLUTION + *DATA COLLECTION + AQUATIC ORGANISM + RADIATION EFFECT + SPOKESMAN, AEC

045384
MOGHISSI AA + LIEBERMAN R
TRITIUM BODY BURDEN OF CHILDREN, 1967-1968
SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY + SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY
5 PAGES, 2 FIGURES, 15 TABLES, 17 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 11(5), PG 227-231 (MAY 1970)

THE TRITIUM CONCENTRATION IN BODY WATER OF CHILDREN WAS DETERMINED FROM SAMPLES OF URINE TAKEN FROM TWO CHILDREN IN EACH OF NINE INSTITUTIONAL TOTAL DIET SAMPLING STATIONS. THE TRITIUM CONCENTRATIONS IN BODY WATER OF CHILDREN GRADUALLY DECREASED FROM ABOUT 1.5 NCI/LITER TO LESS THAN 0.2 NCI/LITER DURING THE PERIOD, JANUARY 1967 TO DECEMBER 1968. SEVERAL ANOMALIES WERE NOTED. THE DOSE EQUIVALENT FROM TRITIUM FOR STANDARD MAN WAS CALCULATED TO BE 0.15 MREM FOR 1967 AND 0.13 MREM FOR 1968. THE DOSE EQUIVALENT FOR CHILDREN VARIES ACCORDING TO AGE AND IS ROUGHLY 0.1 MREM FOR A 13-YEAR-OLD CHILD.

DOSE + *DIETARY HABIT + *CONCENTRATION + EFFECT, AGE + *EXCRETION, URINE + *MAN + *YOUNG + BODY FLUID

045385
MOGHISSI AA + LYON RJ
TRITIUM CONCENTRATIONS IN FOOD, 1967-1968
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY + SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY
4 PAGES, 2 FIGURES, 4 TABLES, 9 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 11(5), PG 233-236 (MAY 1970)

TRITIUM CONCENTRATIONS WERE DETERMINED IN FOOD SAMPLES OBTAINED FROM SEVERAL CHILDRENS HOMES IN THE UNITED STATES. THE AVERAGE CONCENTRATIONS OF TRITIUM IN FOOD INDICATE A DECREASING TREND FROM 1967 TO 1968. THE AVERAGE DOSE EQUIVALENT FROM TRITIUM IN FOOD WAS CALCULATED TO BE 0.08 MREM FOR 1967 AND 0.03 MREM FOR 1968.

DOSE + *DIETARY HABIT + UNITED STATES + CONCENTRATION + *FOOD CHAIN + MAN + FOOD

045597
JOHNSTON JE
HEALTH PHYSICS AND MEDICAL DIVISION PROGRESS REPORT, JAN - DEC 1968
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL (ENGLAND)
AERE-PR/HPM-13 +. 49 PAGES, MARCH 1969

STUDIES ARE REPORTED UNDER THE FOLLOWING HEADINGS - AEROSOLS. PHYSICAL CHEMISTRY, NATURAL ENVIRONMENT, PHYSICS, ATMOSPHERIC POLLUTION. RADIATION PHYSICS. NEUTRON DOSIMETRY AND RADIOBIOPHYSICS, PERSONNEL DOSIMETRY, SPECIAL INVESTIGATIONS, RADIATION SPECTROMETRY AND COMPUTER PROCESSING, FALLOUT. METABOLIC STUDIES. MEASUREMENT OF PU IN LUNG, RETENTION OF ALKALINE EARTHS, ACTINIDES, CS AND K, RETENTION IN THORAX, NEUTRON ACTIVATION ANALYSIS IN VIVO, INSTRUMENTATION, TRABECULAR BONE. OPERATIONS GROUP. HUMAN BIOLOGY AND BIOMEDICAL RESEARCH (INHALATION STUDIES; ASBESTOS STUDIES; TRITIUM STUDIES;), BIOASSAY. MEDICAL SERVICES. STUDY OF ISCHAEMIC HEART DISEASE, SMOKING CLINIC, TETANUS IMMUNIZATION, CLINICAL PATHOLOGY, RADIOLOGY. A LIST OF PUBLICATIONS BY THE STAFF ARE INCLUDED.

*AEROSOL + *BIOMEDICAL + *DOSIMETRY + INHALATION + RADIOBIOLOGY + RADIOLOGY + *PHYSIOLOGY/METABOLISM + *PATHOLOGY

047898
WHEELER JK + MOGHISSI AA + REHNBERG BF + COLVIN MC
COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS
EASTERN ENVIRONMENTAL RADIATION LABORATORY, ALABAMA
4 PAGES, 2 FIGURES, 1 TABLE, 6 REFERENCES, HEALTH PHYSICS, 22(1), PP. 35-38 (JANUARY 1972)

A SINGLE ORAL DOSE OF A TRITIATED LUMINOUS COMPOUND IN COMMON USAGE BY THE LUMINOUS DIAL PAINTING INDUSTRY WAS GIVEN TO RATS AND CATS, AND THE TRITIUM CONCENTRATION FOLLOWED IN THE URINE, FECES AND VARIOUS BODY TISSUES. A MAJOR FRACTION OF THE ABSORBED TRITIUM WAS ELIMINATED WITH A BIOLOGICAL HALF-LIFE ESSENTIALLY THE SAME AS THAT OF TRITIATED WATER.

*DOSE + *ABSORPTION + *BIOLOGICAL HALF-LIFE + CONCENTRATION + COMPARISON + MAMMAL, SMALL + LUMINARY + *MAMMAL, RAT + *EXCRETION, FECAL + EXCRETION, URINE

048419
HACKE J + JACOBI W
RADIATION PROTECTION PROBLEMS IN THE RELEASE AND INCORPORATION OF RADIOACTIVE MATERIALS. FOURTH ANNUAL MEETING OF THE ASSOCIATION OF SPECIALISTS FOR RADIATION PROTECTION, BERLIN, 28-30 MAY 1969
HAHN-MEITNER-INSTITUT FUER KERNFORSCHUNG, BERLIN (WEST GERMANY)
CONF-690590 +, 638 PAGES, MAY 1969

REPORTS ON THE VARIOUS PROBLEMS ASSOCIATED WITH RADIOACTIVITY RELEASE, THEIR CONTROL, AND THE BIOLOGICAL EFFECTS ON MAN. ONE PAPER OF 52 IS IN ENGLISH, THE REMAINDER IN GERMAN.

DECONTAMINATION + DEPOSITION + *DOSIMETRY + INHALATION + IODINE + MPC + *MEASUREMENT + URANIUM + ARGON + FAST NEUTRON + *INSTRUMENT CALIBRATION + RADON + HIGH RADIATION + CONTAMINATION + *GERMANY + ICRP + *REACTOR POWER + *RADIOACTIVITY RELEASE + METEOROLOGY + ACCELERATOR + OPERATING EXPERIENCE + *EFFECT + BIOLOGICAL HALF-LIFE + CONCENTRATION + *DOSIMETRY, CLINICAL + THERAPY + BODY BURDEN + FOOD + INSTRUMENTS, MISC.

048519
LAMBERT BE + VENNART J
RADIATION DOSES RECEIVED BY WORKERS USING TRITIUM IN INDUSTRY
RADIOLOGICAL PROTECTION SERVICE, BELMONT, SUTTON, U. K.
8 PAGES, 1 FIGURE, 2 TABLES, 20 REFERENCES, HEALTH PHYSICS, 22(1), PP. 23-30 (JANUARY 1972)

IN RECENT YEARS TRITIUM HAS FOUND MORE AND MORE COMMERCIAL USE PARTICULARLY IN THE LUMINISING INDUSTRY. EXPERIENCE OVER THE PAST 7 YR AT THE RADIOLOGICAL PROTECTION SERVICE HAS SHOWN THAT ENVIRONMENTAL CONTROL ALONE HAS NOT PREVENTED THE INTAKE OF TRITIUM BY WORKERS. RADIOLOGICAL CONTROL HAS, THEREFORE, NECESSITATED CONTINUOUS BIOLOGICAL MONITORING OF WORKERS FOR TRITIUM IN URINE. THE RESULTS OF THIS MONITORING ARE PRESENTED AND SHOW THAT THE RADIATION DOSES RECEIVED BY SOME WORKERS ARE NOT INCONSIDERABLE.

*MONITOR, PERSONNEL + *PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + *CONSUMER PRODUCT + *EXCRETION, URINE + BIOLOGICAL CONTROL

049197
MOGHISSI AA + TOERBER ED + REGNIER JE + CARTER MW + POSEY CD
HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING
SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY, ALABAMA
7 PAGES, 2 FIGURES, 9 REFERENCES, HEALTH PHYSICS, 18(3), PG 255-261 (MARCH 1970)

THE SURVEY OF A LUMINOUS DIAL PAINTING PLANT IS DESCRIBED. UNDER THE CONDITIONS INVESTIGATED, SKIN CONTAMINATION WAS INDICATED AS A MAJOR MODE OF ENTRY OF TRITIUM INTO THE BODY OF THE WORKERS. A NEW UNIT, GRAM-LAMBERT (G-L) IS PROPOSED FOR COMPARISON OF RADIOACTIVE LUMINOUS PAINTS. IT IS SHOWN THAT THE BENEFIT OF THE PRODUCTION OF 1 G-MICRON L IS ASSOCIATED WITH THE RISK OF APPROXIMATELY 0.16 MREM TO THE WORKERS STUDIED. A MAXIMUM TRITIUM ACTIVITY WHICH MAY BE PROCESSED BY A WORKER WITHOUT EXCEEDING THE MAXIMUM PERMISSIBLE BODY BURDEN IS PROPOSED.

*MPBB + REGULATION + *CONTAMINATION + PERSONNEL EXPOSURE, RADIATION + *EXPOSURE, CHRONIC + *EXPOSURE, SKIN

049517
CARGILL DI + STEINETZ BG + GOSNELL E + BEACH VL + MELI A + FUJIMOTO GI + REYNOLDS BM
FATE OF INGESTED RADIOLABELED ETHYNYLESTRADIOL AND ITS 3-CYCLOPENTYL ETHER IN PATIENTS WITH BILE FISTULAS
WARNER-LAMBERT RESEARCH INSTITUTE, N.J. + ALBERT EINSTEIN COLLEGE OF MEDICINE, N.Y. + MISERICORDIA HOSPITAL, N.Y.
11 PAGES, 3 FIGURES, 5 TABLES, 27 REFERENCES, JOURNAL OF CLINICAL ENDOCRINOLOGY AND METABOLISM, 29(8), PG 1051-1061 (1969)

RETENTION OF THE ETHER, GIVEN ORALLY TO HUMANS, IS GREATER THAN ITS PARENT, THOUGHT TO BE DUE TO STORAGE AND SLOW RELEASE FROM FAT DEPOTS OF THE FORMER. 3 FEMALES AND 1 MALE WERE GIVEN ORAL DOSES OF THE TITLE COMPOUNDS RANGING FROM 3 TO 63 MICROCURIES, LABELED EITHER WITH H-3 OR C-13. URINARY EXCRETION CURVES OUT TO 4 DAYS ARE SHOWN, AND COMBINED URINARY PLUS BILE EXCRETION FROM 0 TO 1 DAY. PERCENTAGES OF GLUCURONIDE VS SULFATED CONJUGATE FORMS TABULATED. IN THE FIRST 30 HOURS POSTORAL, URINARY AND BILIARY EXCRETION OF TRITIUM FROM THE 17 ALPHA-ETHYNYL-6,7-DI-H3-ESTRADIOL-17 BETA STEROID WERE BOTH FIVE TO SIX TIMES THAT FROM THE 6,7-H3-3-CYCLOPENTYL-1 PRIME-C14 ETHER DERIVATIVE.

CARBON + INGESTION + RADIOBIOLOGY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + PHYSIOLOGY/METABOLISM + EXCRETION, URINE + MAN + FEMALE + MALE + ORGANIC + IC PATHOLOGICAL + RADIOPHARMACEUTICAL + STEROID

049527
MOSKALEV JI + BULDAKOV LA + LYAGINSKAYA AM + OVCHARENKO EP + FGOROVA TM
EXPTL STUDY OF RADIONUCLIDE TRANSFER THROUGH THE PLACENTA AND THEIR BIOL ACTION ON THE FETUS
INSTITUTE OF BIOPHYSICS, MINISTRY OF PUBLIC HEALTH, MOSCOW, USSR
CONF-590501 +. 8 PAGES, 6 TABLES, PG 153-160 OF THE PROCEEDINGS OF THE NINTH ANNUAL HANFORD BIOLOGY SYMPOSIUM ON RADIATION BIOLOGY OF THE FETAL AND JUVENILE MAMMAL, RICHLAND, WASHINGTON, MAY 5-8, 1969

RADIONUCLIDES WERE INJECTED AT 1,4,7,9,11,13,15, AND 17 DAYS OF GESTATION AND 1 TO 10, 90. AND 180 DAYS BEFORE IMPREGNATION. AND SACRIFICED AT VARIOUS TIMES POSTINJECTION. THE SMALLER THE AMOUNT OF AM-241 INJECTED, THE GREATER THE FRACTION RETAINED IN THE PLACENTA. NP-237 PLACENTAL RETENTION INCREASED AS PREGNANCY TIME INCREASED, AS ALSO OCCURRED WITH CS-137, SR-90, H-3, AND I-131. IN LATE PREGNANCY, H-3 CONTENT OF PLACENTA WAS 4.3 TIMES GREATER THAN THAT OF FETUS. PERCENT OF ADMINISTERED DOSE FOUND IN VARIOUS ORGANS OF THE FETUS AT VARIOUS PREGNANCY DAYS (MOTHER AND FETUS SACRIFICED 2 DAYS POST I.V.) ARE TABULATED FOR THE TRANSURANICS STUDIED. FETAL DOSES IN RADS ARE GIVEN FOR SR-90, AM-241, I-131, AND H-3, AND CORRESPONDING PERCENT FETAL LETHALITIES. DECREASES IN POSTNATAL SIZE AND WEIGHT DUE TO SR-90 ARE TABULATED. VASCULAR DISORDERS FROM HTO ARE DISCUSSED. PERCENT EMBRYONIC LETHALITIES FROM AM-241 ARE TABULATED. EFFECT OF SR-90 ON FETAL AND PLACENTAL WEIGHTS ARE TABULATED. CS-137 CONTENTS OF NEWBORN ANIMALS ARE TABULATED IN PERCENT OF DOSE PER GRAM OF ANIMAL, PER OFFSPRING, AND PER LITTER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

INGESTION + IODINE + PLUTONIUM + STRONTIUM + NEPTUNIUM + DOSE CALCULATION, INTERNAL + AMERICIUM + TRANSURANIUM ELEMENT + RADIONUCLIDE UPTAKE + PHYSIOLOGY/METABOLISM + DISTRIBUTION + PREGNANT + MORPHOLOGY + MAMMAL, SMALL + MAMMAL, DOG + BONE + MAMMAL, RAT + EMBRYO + EXPOSURE, IV + EXPOSURE, SC + FETUS + LIVER + PLACENTA + UTERUS + FEMALE + IC GROSSLY NORMAL + PATHOLOGY + PLACENTAL TRANSFER

049533
CAHILL DF + YUILE CL
SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL DEVELOPMENT
UNIVERSITY OF ROCHESTER SCHOOL OF MEDICINE AND DENTISTRY, N.Y.
CONF-690501 +. 5 PAGES, 6 TABLES, 5 REFERENCES, PG. 283-287 OF THE PROCEEDINGS OF THE NINTH ANNUAL SYMPOSIUM ON RADIATION BIOLOGY OF THE FETAL AND JUVENILE MAMMAL, RICHLAND, WASHINGTON, MAY 5-8, 1969

TERM FETAL ORGAN WEIGHTS ARE TABULATED FOR MALE AND FEMALE RAT, AS WELL AS ORGAN-BOUND TRITIUM, SPLEEN BEING HIGHEST IN MICROCURIES PER MILLIGRAM AT ALL 3 DOSE LEVELS STUDIED. ORGANICALLY BOUND TRITIUM WAS PROPORTIONAL TO LEVELS OF TRITIUM IN BODY FLUIDS AND SEEMS TO BE PROPORTIONAL TO LEVELS IN WATER EXCEPT FOR A DILUTION FACTOR OF ABOUT 30%.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

INGESTION + OXIDE + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + PREGNANT + MAMMAL, RAT + EXPOSURE, CHRONIC + FETUS + KIDNEY + LIVER + SPLEEN + TESTIS + FEMALE + MASS + ORGANIC + BRAIN + EFFECT, DOSE + HEART + THYMUS

049550
SANDERS SM + REINIG WC
ASSESSMENT OF TRITIUM IN MAN
9 PAGES, 2 FIGURES, 3 TABLES, 9 REFERENCES, PG 534-542 OF THE PROCEEDINGS OF THE SYMPOSIUM ON DIAGNOSIS AND TREATMENT OF DEPOSITED RADIONUCLIDES, RICHLAND, WASHINGTON, MAY 15-17, 1967

MILLICURIES WHILE WORKING IN A PROCESS AREA, PROBABLY BY INHALATION, AND HIS URINARY EXCRETION WAS FOLLOWED FOR 415 DAYS, IN MICROCURIES PER LITER, TO WHICH WAS FITTED THE 3-EXPONENTIAL FUNCTION, NORMALIZING TO 100 AT TIME ZERO - 99.72 EXP (-0.113T) + 0.2776 EXP (-0296T) + 0.004570 EXP (-0.00202T). THE ORGANICALLY BOUND TRITIUM COMPARTMENT FOR A 100-KG MAN WAS CALCULATED TO BE PERHAPS 28.5 KG, THAT IS, THE MASS OF ALL BODY COMPONENTS EXCEPT WATER, COMPACT BONE AND TEETH. IT WAS CONCLUDED THAT THE DOSE CONTRIBUTED BY ORGANICALLY BOUND TRITIUM FOR SUCH A CASE SHOULD BE LESS THAN THAT CONTRIBUTED BY THE BODY WATER, AND THAT THE USUAL PRACTICE OF ESTIMATING ABSORBED DOSE FROM THE 1ST EXPONENT, ONLY, OF THE EXCRETION RATE CURVE RESULTS IN A GOODAPPROXIMATION OF THE DOSE FROM BODY-WATER TRITIUM.

INHALATION + WATER + DOSE CALCULATION, INTERNAL + *PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + EXCRETION, URINE + *EXPONENTIAL FUNCTION + MAN + ORGANIC + *YEAR

049585
LASSEN NA
ASSESSMENT OF TISSUE RADIATION DOSE IN CLINICAL USE OF RADIOACTIVE INERT GASES, WITH EXAMPLES OF ABSORBED DOSES FROM H-3, KR-85 AND XE-133
7 PAGES, 5 TABLES, 8 REFERENCES, MINERVA NUCLEARE, VOL. 8, PG 211-217 (1964)

NO ORIGINAL DATA. ASSUMES THAT INERT GASES CAN ONLY EXIST IN SIMPLE PHYSICAL SOLUTION IN TISSUES, THAT ELIMINATION FROM BODY IS THEREFORE SOLELY DETERMINED BY PHYSICOMECHANICAL FACTORS, NAMELY, SOLUBILITY, DIFFUSION COEFFICIENT, DIFFUSION DISTANCE, BLOOD FLOW AND VENTILATION. INTERACTION OF WHICH FACTORS RESULTS IN A BIOLOGICAL HALF-LIFE OF THE ORDER OF MINUTES. SOLUBILITY COEFFICIENTS

049585 *CONTINUED*
ARE TABULATED FOR FAT, BLOOD, AND OTHER TISSUE. BETA AND GAMMA DOSES FOR XE-133 ARE TABULATED FOR THE KEY-WORD ORGANS, FOR 1-MINUTE INHALATION AT A CONCENTRATION OF 1 MICROCURIE PER MILLILITER IN AN AVERAGE NORMAL SUBJECT FROM THE USUAL DOSE EQUATIONS. BETA DOSE TO GONADS IS 0.6 MILLIRAD, WHILE THE TOTAL DOSE FOR 3 BODY TYPES ARE 0.9 FOR A BODY CONTAINING 10 PERCENT FAT, 1.1 FOR 30 PERCENT, AND 1.4 FOR 50 PERCENT FAT. THE HIGHEST GONADAL DOSE FROM INJECTION OF 5 MILLICURIES OF XE-133 IS CALCULATED TO BE 1 MILLIRAD, THE SAME AS WOULD BE RECEIVED FROM BACKGROUND BY LIVING 3 DAYS AT SEA LEVEL. IT IS CONCLUDED BY AUTHOR THAT INHALATION OF 1 MICROCURIE PER MILLILITER FOR 1 MINUTE, OR EJECTION OF 5 MILLICURIES OF THE KEYWORD NUCLIDES MAY BE USED IN MAN SAFELY IF CLINICALLY REQUIRED.

INHALATION + KRYPTON + XENON + DOSE CALCULATION, INTERNAL + REVIEW + GAS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + DISTRIBUTION + BONE + EXPOSURE, IV + FAT + KIDNEY + LUNG + MAN + MUSCLE + OVARY + *SOLUBILITY + TESTIS + MASS + HEART + TRACHEA

049586
VENNART J
RADIOTOXICOLOGY OF TRITIUM AND C-14 COMPOUNDS
RADIOLOGICAL PROTECTION SERVICE, BELMONT, SUTTON, SURREY, ENGLAND
12 PAGES, 7 TABLES, 29 REFERENCES, HEALTH PHYSICS, VOL. 16, PG 429-440 (1969)

NO ORIGINAL DATA. REVIEW OF TRITIUM ASSUMPTIONS, AND REM-PER-MILLICURIE DOSES ARE TABULATED FOR THE KEYWORD ORGANS BY INJECTION AND BY INGESTION FOR TRITIATED WATER, FOLIC ACID, THYMIDINE, CORTISOL, ALDOSTERONE, AND CORTICOSTERONE. DOSE TO RATS FROM INGESTED THYMIDINE WAS CALCULATED TO BE 9 FOR TESTES AND 18.5 WHEN INJECTED. LIVER DOSE FROM TRITIATED WATER WAS 16 AND FROM TRITIATED FOLIC ACID 110, WHILE FOR CORTISOL-1,2-T IT WAS 1.1. FOR ALDOSTERONE-1,2-T 9.55 AND FOR CORTICOSTERONE-1,2-T IT WAS 0.9, ALL BY INJECTION. FOR INGESTION AND INJECTION, RESPECTIVELY, OF TRITIATED THYMIDINE DOSES TO BONE MARROW WERE CALCULATED AS 12 AND 42.5 REMS PER MILLICURIE. ASSUMING A QUALITY FACTOR OF 1.7, MAXIMUM PERMISSIBLE ANNUAL INTAKES OF TRITIATED COMPOUNDS TO BLOOD OF ADULT WORKERS, BASED ON AVERAGE DOSES TO ORGANS, ARE CITED FOR THE FOLLOWING CRITICAL TISSUES - 30 MILLICURIES TO TESTES AND BONE MARROW FOR WATER, 10 TO LIVER FOR FOLIC ACID, 10 TO BONE MARROW FOR THYMIDINE AND 1000 TO LIVER FOR CORTICOSTEROIDS. FOR CORRESPONDING COMPOUNDS LABELED WITH C-14 INSTEAD OF H-3, RESPECTIVE VALUES SHOULD BE UP TO 10 TIMES LESS, ASSUMING SAME EXCHANGE AND BREAKDOWN PROCESSES FOR THE TWO NUCLIDES.

CARBON + INGESTION + DOSE CALCULATION, INTERNAL + *CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TOXICITY + DISTRIBUTION + BLOOD + BONE, MARROW + MAMMAL, RAT + EXPOSURE, IP + GI TRACT + KIDNEY + LIVER + LUNG + MAN + MATURE + SPLEEN + TESTIS + WHOLE BODY + INORGANIC + *ORGANIC + RADIOPHARMACEUTICAL + STEROID + THYMIDINE + THYMUS

049600
CHIPPERFIELD B
TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL DIPHOSPHATE
UNIVERSITY OF CAMBRIDGE + ADDENBROOKES HOSPITAL, ENGLAND
15 PAGES, 9 FIGURES, 4 TABLES, 24 REFERENCES, INTERNATIONAL JOURNAL OF CANCER, VOL. 2, PG 381-395 (1967)

3 TRITIATED FORMS OF THE TITLE COMPOUND WERE STUDIED - (1) 6 POSITION OF THE B RING TRITIATED, (2) 6,7 POSITIONS, AND (3) 5,6,7 POSITIONS, AND USED IN THERAPEUTIC AMOUNTS ON 16 PATIENTS WITH DIFFERENT CANCERS. FROM DATA OBTAINED, THE FOLLOWING BIOLOGICAL HALF-LIVES WERE CALCULATED (THE COMPOUND USED UNSPECIFIED) - HEART 5.7, LUNG 6.2, SMALL INTESTINE 7.6, KIDNEY 7.8, SKELETAL MUSCLE 9, BONE MARROW 12.5, LIVER 14.5, TESTIS 17, SPLEEN 23.8, AND BRAIN 34.5, THE RESPECTIVE STANDARD DEVIATIONS BEING 1.0, 1.3, 1.3, 1.8, 4.5, 7.5, 6.5, 2.1, 2.6, AND 10. WET-TISSUE CONCENTRATIONS FOR CASE 119 IN MICROCURIES PER GRAM FOR THE SAME RESPECTIVE ORGANS WERE 15.0, 16.5, 12.2, 48.6, 13.1, 11.8, 21.5, 20.8, 17.7, AND 15.9.

*BIOMEDICAL + DOSE CALCULATION, INTERNAL + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + PHYSIOLOGY/METABOLISM + DISTRIBUTION + BONE, MARROW + *CANCER + INTESTINE, LARGE + EXPOSURE, IV + *KIDNEY + LIVER + LUNG + MAN + MUSCLE + INTESTINE, SMALL + SPLEEN + TESTIS + THYROID + ORGANIC + IC PATHOLOGICAL + PATHOLOGY + RADIOPHARMACEUTICAL + RETENTION FUNCTION + BRAIN + HEART + MONTH + PHYSICOCHEMICAL FORM

049605
SNYDER WS + FISH BR + BERNARD SR + FORD MR + MUIR JR
URINARY EXCRETION OF TRITIUM FOLLOWING EXPOSURE OF MAN TO HTO - A TWO EXPONENTIAL MODEL
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
13 PAGES, 2 FIGURES, 2 TABLES, 18 REFERENCES, PHYSICS IN MEDICINE AND BIOLOGY, VOL. 13(4), PG 547-559 (1968)

ACCIDENTAL INHALATION OF HTO IN A HOOD BY A SCIENTIST AT ORNL MADE POSSIBLE URINARY, BLOOD SALIVA, AND SPUTUM SAMPLES, URINARY OUT TO 260 DAYS, TO THE LATTER OF WHICH WAS FITTED A 2-EXPONENTIAL, WITH RESPECTIVE BIOLOGICAL HALF-LIVES OF ABOUT 9 AND 34 DAYS. WITH ADULT MICE, RC THOMPSON (JBC 197, 81-7 (1952)) FOUND 9- AND 90-DAY BIOLOGICAL HALF-LIVES IN A 160-DAY STUDY. FIT TO THE HUMAN DATA WAS MADE WITH THE LASL CODE (RICHMOND, CR, HEALTH PHYSICS 10, 2 (1964) OF LOS ALAMOS. THE SUBJECTS TOTAL BODY WATER WAS ESTIMATED BY (1) WEIGHT, (2) AGE, (3) WEIGHT/HEIGHT RATIO, AND (4) WHOLE-BODY POTASSIUM, AND 36 LITERS WAS DECIDED ON AS THE AMOUNT OF BODY WATER FOR THE 41-YEAR-OLD, 66.5 KILOGRAM, 161-CENTIMETER-TALL MAN. TABULATION FROM LITERATURE OF HYDROGEN CONTENTS OF THE MAJOR ORGANS AVERAGED ABOUT 10 PERCENT, EXCEPT FOR BONE, WHICH IS 3.4 PERCENT ACCORDING TO WOODARD (1962). IT IS CONCLUDED UNLIKELY BY THE AUTHORS THAT ANY TISSUE CAN GET A DOSE FROM INGESTED HTO THAT IS MARKEDLY IN EXCESS OF THAT TO BODY WATER, WHICH THEY CALCULATE TO BE ABOUT 16 REMS, THE LONG TERM-COMPONENT OF 34 DAYS CONTRIBUTING ABOUT 2 PERCENT OF TOTAL, FROM THE 2-COMPARTMENT MODEL USED, THE 2ND COMPARTMENT BEING A 1440-GRAM MASS OF UNKNOWN TISSUE WITHIN A FACTOR OF 2.

C49605 *CONTINUED*
OXIDE + WATER + DOSE CALCULATION, INTERNAL + PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + BLOOD, SERUM + EXCRETION, URINE + EXPONENTIAL FUNCTION + MAN + MATURE + MALE + IC GROSSLY NORMAL + RETENTION FUNCTION + BODY FLUID + MONTH

049639
LYAGINSKAYA AM + ISTOMINA AG
TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN PERIODS OF PRENATAL AND POSTNATAL LIFE
INSTITUTE OF BIOPHYSICS, MINISTRY OF HEALTH, USSR, MOSCOW
AEC-TR-7013 +. 6 PAGES, TRANSLATED FROM RADIOBIOLOGIYA, VOL. 8, PG. 859-862 (1968)

180-190 GRAM RATS WERE INJECTED WITH A DOSE OF 3 X 10 (EXP -4) PER GRAM OF BODY WEIGHT, BOTH PREGNANT AND NONPREGNANT, AND SACRIFICED ON 22ND DAY OF PREGNANCY, 10 RATS TOTAL. ELIMINATION FROM THE AQUEOUS PHASE OF THE MOTHERS BODY WAS 2 EXPONENTIAL. IN THE NONPREGNANT FEMALES, 79 PERCENT WAS ELIMINATED FROM THE AQUEOUS PHASE IN 3.1 DAYS, AND IN THE PREGNANT 84 PERCENT IN 2.7 DAYS, THE REMAINING AMOUNTS IN THE 1ST DAY. AUTHORS SUGGEST DECREASED ELIMINATION TIME MAY BE DUE TO (1) INCREASED METABOLISM AND (2) MORE RAPID BODY-WEIGHT INCREASE IN PREGNANCY. TRITIUM OXIDE CONTENT OF THE WATER EXTRACTED FROM UTERUS, PLACENTA, AND FETUS WAS THE SAME AS IN THE WATER OF THE MATERNAL ORGANS, NAMELY 1.5 X 10 (EXP -6) CURIES PER ML.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

OXIDE + DOSE CALCULATION, INTERNAL + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *CONCENTRATION + TOXICITY + *DISTRIBUTION + BLOOD + *PREGNANT + BONE + MAMMAL, RAT + FETUS + LIVER + MUSCLE + PLACENTA + SKIN + UTERUS + FEMALE

049684
PATZER RG
RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE IGENSTION
UNIVERSITY OF MICHIGAN
98 PAGES, 13 FIGURES, 8 TABLES, 43 REFERENCES, 1968 (THESIS), T 6636

PRESENCE OF NONLABILE TRITIUM IN TISSUES OF MAN AFTER INTAKE OF HTO WAS NOT ACKNOWLEDGED BY ICRP IN 1959 FOR CALCULATING MAXIMUM PERMISSIBLE INTAKES, AND SO THE PURPOSE OF THESIS WAS TO COMPARE DOSE FROM NET (NON-EXCHANGEABLE TRITIUM) WITH THAT CALCD ON ASSUMPTION THAT ALL OF THE TRITIATED WATER INTAKE IS TO BE FOUND IN BODY WATER ONLY, USING A TOTAL OF 6 RATS AND 3-COMPARTMENT MODEL. AUTHORS RESULTS DO NOT WARRANT, IN HIS OPINION, ANY CHANGE IN THE RECOMMENDED MPC OF ICRP 1959, SINCE THE LONG-TERM COMPONENT DOES NOT ADD TOO SIGNIFICANTLY TO ORGAN DOSES. FOR EXAMPLE, 254 DAYS AFTER HAVING CONSUMED 3 MICROCURIES/ML OF TRITIUM OXIDE (HTO) IN DRINKING WATER OVER 111 DAYS. CONTINUOUS, TESTES RECEIVED 51 RADS (CONSIDERING TRITIUM TO BE PRESENT ONLY IN BODY WATER, 1 EXPONENTIAL) AS AGAINST 53 RADS (BODY WATER TRITIUM + NONEXCHANGEABLE TRITIUM).

MPC + OXIDE + *DOSE CALCULATION, INTERNAL + WATER, DRINKING + ICRP + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *DISTRIBUTION + BLOOD + BLOOD, SERUM + BONE, MARROW + *CELL, NUCLEUS + MAMMAL, RAT + EXPONENTIAL FUNCTION + EXPOSURE, CHRONIC + LIVER + MUSCLE + INTESTINE, SMALL + *TESTIS + RETENTION FUNCTION + BODY FLUID + BRAIN + MONTH

C49700
JACKSON S + DOLPHIN GW
ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
4 PAGES, HEALTH PHYSICS, VOL. 12, PG 494-497 (1966)

REVIEW. NO ORIGINAL DATA. TRITIATED HYDROGEN GAS AND TRITIATED WATER ARE MOST COMMON. TURNOVER OF TRITIATED ORGANIC COMPOUNDS MAY BE SLOWER THAN TRITIATED WATER, AND EVEN WITH THE LATTER THERE IS A SMALL, LONG-TERM COMPONENT. ICRP 2 (1959) ACCEPTED A NOT UNREALISTIC AVERAGE BIOLOGICAL HALF-LIFE OF 12 DAYS, 0.6 OF THE EXCRETED TRITIATED WATER BEING VIA URINE, SO THAT THE URINARY EXCRETION RATE WOULD THEN BE REPRESENTED AS U(T) EQUALS 3.5 E (EXP -0.0576T). URINARY EXCRETION RATE EXPRESSED AS A PROPORTION OF THE BODY CONTENT AT TIME T WOULD BE 3.5 PERCENT. WITH A MAXIMUM PERMISSIBLE BODY BURDEN OF 1000 MICROCURIES, CORRESPONDING URINARY EXCRETION RATE WOULD BE 35 MICROCURIES/DAY, 1/10 OF WHICH, 3 MICROCURIES PER LITER, WOULD BE THE INVESTIGATION LEVEL.

OXIDE + *PERSONNEL EXPOSURE, RADIATION + REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *EXCRETION, URINE + MAN + WHOLE BODY + RETENTION FUNCTION

049702
BUTLER RE
ASSESSMENT OF TRITIUM IN PRODUCTION WORKERS
SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA
12 PAGES, 7 FIGURES, 1 TABLE, 15 REFERENCES, PG 431-442 OF THE PROCEEDINGS OF THE SYMPOSIUM ON THE ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN, HEIDELBERG, MAY 11-16, 1964

X MORE THAN 300,000 URINE SAMPLES WERE ANALYZED FOR TRITIUM IN THE FIRST 10 YEARS OF SAVANNAH RIVER PLANT OPERATION. THE BIOLOGICAL HALF-LIFE OF TRITIUM WAS FOUND TO VARY INVERSELY WITH THE AMBIENT TEMPERATURE, 7 DAYS IN JULY AND 12 DAYS BETWEEN NOV.-MAR. THE HALF-LIFE DECREASES WITH AGE, POSSIBLY DUE TO DECREASED ANTIDIURETIC HORMONE PRODUCTION WITH INCREASED AGE. IN 310 CASES

049702 *CONTINUED*
WHERE THE INITIAL TRITIUM CONCENTRATIONS IN URINE RANGED FROM 20 TO 118 MICROCURIES PER LITER, WITH A 12-DAY BIOLOGICAL HALF-LIFE ASSUMED WHEN URINARY TRITIUM IS LESS THA 20 MICROCURIES PER LITER. TRITIUM RETENTION IS A FUNCTION OF THE BODY-WATER TURNOVER. CF JACKSON AND DOLPHIN, HEALTH PHYSICS 12, 495 (1966).

DOSE CALCULATION, INTERNAL + PERSONNEL EXPOSURE, RADIATION + ENVIRONMENT + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + *TEMPERATURE + *EFFECT, AGE + MAN + BODY FLUID

049711
WHITTON JT
CRITICAL ANALYSIS OF ICRP DERIVATION OF MAXIMUM PERMISSIBLE CONCENTRATION OF TRITIUM
CENTRAL ELECTRICITY GENERATING BOARD, BERKELEY NUCLEAR LABORATORIES, ENGLAND
RD/B/M-1354 +. 19 PAGES, NOVEMBER 1969. T7220

NO ORIGINAL DATA. REVIEWS ICRP NUMERICAL METHOD OF CALCULATING WHOLE-BODY (MPC)A AND (MPC)W FOR HTO. AUTHOR STATES THAT THE MPC VALUES TO SKIN FOR TRITIUM-GAS SUBMERSION ARE UNRELIABLE, CITING PRIVATE COMMUNICATION BETWEEN WHEATLEY AND VENNART, THE FACT THAT THE SOLUBILITY OF TRITIUM GAS IN THE BODY WATER AND OXIDATION OF TRITIUM GAS IN THE ATMOSPHERIC AIR OR IN THE BODY ARE IGNORED, AND THAT THE METHOD OF ESTIMATING SKIN DOSE IS SUSPECT SINCE RANGE OF TRITIUM BETAS IS LESS THAN THICKNESS OF EPIDERMIS. AUTHOR ARGUES THAT MPC VALUES FOR TRITIUM ARE INDEPENDENT OF AGE, BODY WEIGHT, WATER INTAKE, AND EXCRETION RATE AND SUGGESTS CONFIRMATION FROM VENNART BY AN ALTERNATIVE ARGUMENT. SHE CONCLUDES IT IS UNLIKELY THAT ICRP CALCULATIONS HAVE OVERESTIMATED OR UNDERESTIMATED DOSES BY A FACTOR GREATER THAN 2.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*MPC + OXIDE + ICRP + PERSONNEL EXPOSURE, RADIATION + *REVIEW + GAS + LIQUID + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + MAN + RBE + SKIN + SOLUBILITY

049712
VENNART J
THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS
RADIOLOGICAL PROTECTION SERVICE, BELMONT, SUTTON, SURREY, ENGLAND
8 PAGES, 3 TABLES, 27 REFERENCES, HEALTH PHYSICS, VOL. 14, PG 541-548 (1968)

NO ORIGINAL DATA. REVIEWS THE QUALITY FACTOR (QF) AND THE STOPPING POWER OR LINEAR ENERGY TRANSFER (LET) IN TERMS OF THE RELATIVE BIOLOGICAL EFFECTIVENESS (RBE). FOR REPORT OF THE RBE COMMITTEE TO ICRP AND ICRU, SEE HEALTH PHYSICS 9, 357 (1963). LITERATURE VALUES FOR RBE RANGED FROM 1 TO 2 WHEN RATS AND MICE WERE INJECTED IN VIVO WITH TRITIUM OXIDE, AND WHEN HUMAN HELA CELLS, BACTERIAL AND PLANT CELLS, WERE GROWN IN VITRO IN SAME. RBE IS THE INVERSE RATIO OF DOSES FROM TWO RADIATIONS WHICH PRODUCE THE SAME BIOLOGICAL EFFECT. REFERENCE RADIATION IS COMMONLY 175 TO 250 KEV X RAY, OR GAMMA RAYS FROM CO-60 OR RA-226. VARIATION FROM 1 TO 2 OF THE LITERATURE RBE VALUES CAN BE PARTIALLY EXPLAINED IF THE CO-60 OR RA-226 GAMMA RAYS RELATIVE TO 200-KEV X RAYS ARE DIFFERENT FROM UNITY IN BIOLOGICAL EFFECT, AND AT THE RELATIVELY HIGH DOSE RATES COMMONLY USED.

OXIDE + HAZARD, RELATIVE + ICRP + *REVIEW + *RADIOBIOLOGY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + EFFECT, GENETIC + MAN + *RBE + IN VITRO

049713
EVANS AG
NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES
SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA
7 PAGES, 8 FIGURES, 3 TABLES, 12 REFERENCES, HEALTH PHYSICS, VOL. 16, PG 57-63 (1969)

ONLY A SMALL FRACTION OF THE TOTAL DOSE IN ACUTE EXPOSURE IS ATTRIBUTABLE TO LABELING OF ORGANIC MOLECULES IN THE BODY, BUT ANIMAL DATA SHOW THAT SUCH LABELING INCREASES WITH EXPOSURE TIME. IN PAST ANIMAL WORK, EQUILIBRIUM BETWEEN AQUEOUS AND ORGANIC TRITIUM HAS NOT BEEN REACHED WITHIN THE FEW WEEKS STUDIED, AND LONG-TERM ENVIRONMENTAL WORK IS EQUALLY DIFFICULT BECAUSE OF THE VERY LOW TRITIUM CONCNS IN THE NATURAL ENVIRONMENT. 52 DEER KILLED OVER 4 MONTHS IN THE SAVANNAH RIVER PLANT AREA WERE ANALYZED FOR TRITIUM AND THE AVERAGE BODY-WATER CONCN FOUND TO RANGE FROM 4 TO 55 PICOCURIES/ML, AND COMBUSTION WATER FROM FREEZE-DRIED TISSUES (7 ORGANS) RANGED FROM 8 TO 39 PICOCURIES/ML, OR AN ORGANIC TRITIUM CONTENT OF 8 PICOCURIES/ML OF COMBUSTION WATER FROM THE ORGANIC MATTER OF DRY TISSUES ANALYZED WHEN BODY-WATER TRITIUM CONCENTRATIONS WERE EXTRAPOLATED TO ZERO.

SAVANNAH RIVER PLANT + ENVIRONMENTAL CONTROL MEASURE + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + *DISTRIBUTION + MAMMAL, LARGE + EXPOSURE, CHRONIC + FAT + KIDNEY + LIVER + MUSCLE + SPLEEN + BODY BURDEN + EXPOSURE, BACKGROUND + BODY FLUID + BRAIN + HEART

049714
BOND VP + FEINENDEGEN LE
INTRANUCLEAR H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION ASPECTS
BROOKHAVEN NATIONAL LABORATORY
14 PAGES, 2 FIGURES, 1 TABLE, 66 REFERENCES, HEALTH PHYSICS, VOL. 12, PG 1007-1020 (1966) T2765

NO ORIGINAL DATA. REVIEW. AUTHORS CONCLUDE THAT THE OBSERVED BIOLOGICAL EFFECTS OF TRITIATED

049714 *CONTINUED*
THYMIDINE (3HTDR) ARE PREDICTABLE ON BASIS OF AVERAGE ABSORBED DOSE TO NUCLEUS. WHILE RECOIL ENERGY (3EV) OF THE HE ATOM FROM TRANSMUTATION OF THE 3H ATOM IN THE THYMIDINE MOLECULE IS INADEQUATE TO RUPTURE CHEMICAL BONDS, CHEMICAL CONSEQUENCES COULD RESULT FROM THE MOLECULAR EXCITATION, WITH SOMATIC AND GENETIC EFFECTS. 3H BETA IN WATER HAS AN AVERAGE RANGE OF 1 MICRON. IN A 2 MICRON UNIT DENSITY SPHERE 37 PERCENT OF THE TOTAL ENERGY ESCAPES. NUCLEAR VOLUME INCREASES DURING DNA SYNTHESIS. AUTHORS CONSIDER THE EDGE EFFECT (ESCAPE OF BETAS AT THE NUCLEAR SURFACE).

*DOSE CALCULATION, INTERNAL + AUTORADIOGRAPHY + *REVIEW + RADIOBIOLOGY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + CHROMOSOMAL EFFECT + PHYSIOLOGY/METABOLISM + TOXICITY + EFFECT, GENETIC + INSECT + DNA + HISTOPATHOLOGY + BONE, MARROW + MAMMAL, RAT + EXPOSURE, IV + MAN + RBE + TUMOR + ORGANIC + IN VITRO + MAMMAL, RODENT + EFFECT, DOSE + THYMIDINE

051314
SPALDING JF
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.
RADIATION RESEARCH 4 PAGES 221-227 1956

TESTING + EFFECT + BIOCHEMICAL + VEGETATION + FOOD CHAIN + BETA RAY

051402
TRUJILLO TT
BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS.
LA-1986 +.

INHALATION + GAS + EFFECT + HIGH + BIOCHEMICAL + CONCENTRATION + MAMMAL, MOUSE

051403
ANDERSON EC
A THEORETICAL CONSIDERATION OF THE HAZARDS ASSOCIATED WITH ACUTE EXPOSURE TO HIGH CONCENTRATIONS OF TRITIUM GAS.
LA-1646 +.

DOSE + GAS + HIGH + CONCENTRATION + RADIATION EXPOSURE + MAN

051404
PINSON EA
PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN.
JOURNAL OF APPLIED PHYSIOLOGY 10 PAGES 108-126 1957

MAN

051405
PINSON EA
THE ABSORPTION OF INGESTED TRITIUM WATER AND THE WATER DILUTION VOLUME OF MAN.
LA-1464 +.

DILUTION + WATER + ABSORPTION + MAN

051406
PINSON EA
ABSORPTION OF LIQUID HTO AND HTO VAPOR THROUGH THE SKIN OF MAN.
LA-1466 +.

LIQUID + ABSORPTION + MAN + SKIN

051407
PINSON EA
THE SPECIFIC ACTIVITY OF TRITIUM IN THE ORGANIC COMPONENTS OF THE SKIN AND FAT OF MAN FOLLOWING EIGHT MONTHS CHRONIC EXPOSURE TO HTO IN BODY FLUIDS.
LA-1468 +.

COMPONENTS + BEHAVIOR + RADIATION EXPOSURE + EXPOSURE, CHRONIC + FAT + MAN + SKIN + ORGANIC + MONTH

051408
PINSON EA
THEORETICAL CONSIDERATIONS OF ACUTE EXPOSURE OF MAN TO HTO OR T*2*O ACTIVITY IN THE ATMOSPHERIC ENVIRONMENT.
LA-1469 +.

051408 *CONTINUED*
DOSE + AIR + ENVIRONMENT + BEHAVIOR + RADIATION EXPOSURE + MAN

051573
RICHMOND CR
ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND TRITIUM.
LAMS-2526 +.

MPC + WATER + ZINC + RADIOISOTOPE + ANIMAL + CONCENTRATION + RADIONUCLIDE TRANSFER + COMPARISON + MAN

051582
THOMPSON RC
STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.
JOURNAL OF BIOLOGICAL CHEMISTRY 206 PAGES 101-107 1954

DEUTERIUM + TRACER + COMPARISON + TURNOVER RATE + MAMMAL, RAT

051628
DELONG CW
PERCUTANEOUS ABSORPTION OF TRITIUM OXIDE.
AMERICAN JOURNAL OF ROENTGENOLOGY, RADIUM THERAPY AND NUCLEAR MEDICINE 71 PAGES 1038-1045 1954

OXIDE + ABSORPTION + MAMMAL, RAT + SKIN

051967
BASERGA R
UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.
LABORATORY INVESTIGATION 11 PAGES 360-364 1962

RADIONUCLIDE UPTAKE + MAN + TUMOR + THYMIDINE

051968
BATEMAN AJ
MUTATIONS INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.
NATURE 193 PAGES 705-706 1962

EFFECT, GENETIC + MAMMAL, MOUSE + THYMIDINE

051998
BOLING EA
DETERMINATION OF K-42, NA-24, BR-82 AND TRITIATED WATER CONCENTRATION IN MAN.
ANNALS OF THE NEW YORK ACADEMY OF SCIENCE 110 PAGES 246-254 1963

SODIUM + WATER + POTASSIUM + BROMINE + CONCENTRATION + MAN + INSTRUMENTS, MISC.

052303
GIBSON JAB
THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM.
AERE-M-1169 +.

TITANIUM + RADIOLOGY

052315
GOODHEART CR
RADIATION DOSE CALCULATION IN CELLS CONTAINING INTRANUCLEAR TRITIUM.
RADIATION RESEARCH 15 PAGES 767-773 1961

DOSE + MATHEMATICAL TREATMENT + RADIATION EFFECT + CELL

052834
QUASTEL MR
CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED THYMIDINE.
RADIATION RESEARCH 18 PAGES 46-57 1963

DOSE + DAMAGE + HIGH + RECOVERY + RADIATION EXPOSURE + MAMMAL, RAT + THYMIDINE

052906
SAMUELS LD
TOXICOLOGICAL STUDIES OF TRITIATED THYMIDINE.
RADIATION RESEARCH 18 PAGES 620-632 1963

EFFECT + CHROMOSOMAL EFFECT + MAMMAL, MOUSE + THYMIDINE

053130
WIMBER DE
EFFECTS OF INTRACELLULAR IRRADIATION WITH TRITIUM.
BNL-7049 +. ADVANCES IN RADIATION BIOLOGY 1 PAGES 85-115 1964

EFFECT + ANIMAL + RADIATION EXPOSURE

053555
RACHMELER M
THE EFFECTS OF TRITIUM DECAY ON DNA. PROGRESS REPORT, JUNE 1, 1966 TO DECEMBER 31, 1966.
COO-1603-1 +.

BACTERIA + EFFECT + CHROMOSOMAL EFFECT + DECOMPOSITION

054534
VENNART J
RADIOTOXICOLOGY OF TRITIUM AND 14-C COMPOUNDS.
HEALTH PHYSICS 16 PAGES 429-440 1969

CARBON + COMPOSITE MATERIAL

054639
DEWEY WC
COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER, AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS.
RADIATION RESEARCH 24 PAGES 214-238 1965

COBALT + WATER + GAMMA + CHROMOSOMAL EFFECT + COMPARISON + THYMIDINE

054897
WORMAN FCV
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.
LA-1641 +.

BIOCHEMICAL + MAMMAL, MOUSE + BETA RAY + THYMUS

054914
FURCHNER J
THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN RATS.
LA-1544 +.

IRON + RADIONUCLIDE UPTAKE + BIOCHEMICAL + MAMMAL, RAT

055111
BARTON CJ + BUTLER HM + CUMMING RB + ROHWER PS
THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS
11 PAGES, 1 TABLE, 2 REFERENCES, NUCLEAR SAFETY, 13(3), PP. 225-235 (MAY-JUNE 1972)

A TRITIUM SYMPOSIUM SPONSORED BY THE WESTERN ENVIRONMENTAL RESEARCH LABORATORY OF THE ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA AT LAS VEGAS WAS HELD IN LAS VEGAS AUG. 30 TO SEPT. 2, 1971. NEARLY 100 PAPERS WERE PRESENTED COVERING A BROAD RANGE OF TOPICS, INCLUDING TRITIUM PRODUCTION, ITS MOVEMENT IN THE ENVIRONMENT, ENVIRONMENTAL RELEASE AND MONITORING, DETECTION AND MEASUREMENT, BIOLOGICAL EFFECTS, BIOKINETICS, APPLICATIONS IN BIOLOGY AND MEDICINE, AND HEALTH PHYSICS. THIS ARTICLE TOUCHES ON ALL ASPECTS OF THE MEETING, BUT PAPERS OF PARTICULAR INTEREST IN THE FIELD OF NUCLEAR SAFETY ARE EMPHASIZED.

*AIRBORNE RELEASE + *BIOMEDICAL + MONITOR, LIQUID + *MONITOR, AIR + ANALYTICAL TECHNIQUE + *MONITORING SYSTEM, RADIATION

056158
BUTLER HL
OBSERVED EFFECTIVE HALF-LIFE OF TRITIUM AT THE SAVANNAH RIVER PLANT
SAVANNAH RIVER PLANT, AIKEN, SOUTH CAROLINA

056158 *CONTINUED*
DP-831 +. 8 PAGES, PG 38-45, 1962 (T7199)

REVIEW OF WORK AT SAVANNAH AND ELSEWHERE. SUMMARY OF BIOLOGICAL HALF-LIFE DATA AT SAVANNAH ON MORE THAN 260 CASES WHERE URINARY TRITIUM WAS FROM 20 TO 110 MICROCURIES/LITER. BETWEEN 5 AND 20 MICORCURIES/LITER, A 12 DAY BIOL HALF-LIFE IS USED TO COMPUTE DOSE, TO GIVE 45 MREMS FROM A 5 MICROCURIE/LITER UPTAKE. PINSON AND LANGHAM (J APPL PHYSIOL 10, 108 (1957)) FOUND A 10-DAY HALF-LIFE WHEN WATER INTAKE WAS 2.7 LITERS/DAY, BUT WHEN WATER INTAKE WAS INCREASED TO 12.8 LITERS/DAY, HALF-LIFE WAS REDUCED TO 2.4 DAYS. IN 8 CASES OF AD LIB. WATER INTAKES, THEY NOTED 4.3 TO 13 DAYS. PRESENT AUTHOR REPORTS 4 TO 18 DAYS FOR AD LIB. WATER INTAKE BY SAVANNAH EMPLOYEES. AVERAGE MEAN TEMP FOR SAVANNAH PLANT AREA FOR 1959-1962 WAS 63 F, COMPARED WITH 80 F AVERAGE FOR SOUTHERN NIGERIA, WHERE A 7.5-DAY HALF-LIFE WAS FOUND. SEASONAL AVERAGE BIOLOGICAL HALF-LIFE VALUES AT SAVANNAH FOR SPRING, SUMMER, FALL, AND WINTER WERE RESPECTIVELY 8.3, 8.3, 10.4 AND 10.4 DAYS. VARIATIONS WITHIN A GIVEN INDIVIDUALS BIOL HALF-LIFE ARE TABULATED. PRESENT AUTHOR DOES NOT CONFIRM THE RELATION BETWEEN HALF-LIFE AND BODY WEIGHT AS A POWER FUNCTION OF 0.8 BODY WEIGHT REPORTED BY RICHMOND ET AL., J CELL COMP PHYSIOL 59, 45-53 (1962).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MONITOR, SAMPLING + WATER, DRINKING + SAVANNAH RIVER PLANT + PERSONNEL EXPOSURE, RADIATION + *ENVIRONMENT + CORRELATION + REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + *TEMPERATURE + *EFFECT, AGE + MAN + MATURE + WHOLE BODY + MASS + *VARIABILITY

056159
OSBORNE RV
ABSORPTION OF TRITIATED WATER VAPOUR BY PEOPLE
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER, ONTARIO
11 PAGES, 7 FIGURES, 8 TABLES, 19 REFERENCES, HEALTH PHYSICS, VOL. 12, PG 1527-1537 (1966) (T3054)

BY EXTRAPOLATION TO WHOLE-BODY SKIN AREA FROM FOREARM EXPOSURE, OTHER WORKERS HAVE SHOWN THAT HTO SKIN ABSORPTION IS ABOUT EQUAL TO THE INTAKE BY INHALATION, UPON WHICH CONSIDERATION ICRP (1959) (MPC) A VALUE OF 5 MICROCURIES/CU METER WAS BASED. IN THE PRESENT PAPER, 17 SUBJECTS VOLUNTEERED TO EXPOSETHEMSELVES IN A CHAMBER TO AIR CONTAINING HTO VAPOUR, WITH AND WITHOUT ORONOSAL MASK, AND WITH COTTON OVERALLS, 1- AND 2-PIECE POLYVINYL CHLORIDE SUITS, AND OTHER TYPE CLOTHING, THE UNPROTECTED EXPOSURE DESIGNED TO KEEP BODY BURDEN OF ABSORBED TRITIUM BELOW 0.6 MILLICURIE, WITH AN UPPER LIMIT OF 1.2 MC FOR OTHER EXPOSURES. AIR TRITIUM CONCNS UP TO 15,000 (MPC)A WERE GENERATED. SKIN INTAKE RATE CORRELATED WITH AVERAGE SKIN TEMP IN THE RANGE 86.3 TO 93 F, SIGNIFICANT AT THE 5 PERCENT LEVEL, AND CORRESPONDING TO 0.73 LITERS PER MINUTE PER DEG F OR 7.6 PERCENT PER DEG F AT 90 F. AVERAGE INTAKE RATE DURING UNPROTECTED EXPOSURES WAS 15.8 + OR - 1.8 LITERS/MIN AND 9.6 + OR - 1.7 WITH MASKS. BODY-WATER VOLUME CORRELATES WITH BODY SURFACE AREA BETTER THAN BODY WT, 22.6 LITERS/SQ METER AVERAGE FOR 30 SUBJECTS. INTAKE RATES FOR 3 UNPROTECTED SUBJECTS WERE 14.8, 14.8, AND 17.9 MICROCURIES/MIN PER MICROCURIE/LITER, AVERAGE SKIN INTAKE RATE BEING 9.6. BIOL. HALF-LIVES BETWEEN 6.4 AND 14.4 DAYS WERE FOUND.

CANADA + *INHALATION + OXIDE + REACTOR SAFETY SYSTEM + CHALK RIVER + CHEMICAL KINETICS + PERSONNEL EXPOSURE, RADIATION + ENVIRONMENT + ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + EXCRETION, URINE + *EXPOSURE, SKIN + MAN + MATURE + SKIN + WHOLE BODY + MASS + BODY BURDEN + IC GROSSLY NORMAL + BODY FLUID + METABOLIC KINETICS

056179
UDEKWU FAO + KOZOLL DD + MEYER KA
DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE
10 PAGES, JOURNAL OF NUCLEAR MEDICINE, VOL. 4, PG. 60-69 (1963) (T6531)

USING A MODIFIED LANGHAM METHOD (J LAB CLIN MED 47, 819 (1967)) PRESENT AUTHORS ESTIMATED TOTAL BODY WATER IN 100 MALE PATIENTS OF ALL AGES BY INJECTING 2 MILLICURIES IN THE ADULTS, 1 MILLICURIE INTO CHILDREN AND 0.1 MILLICURIE INTO INFANTS AND NEWBORNS, FOLLOWED BY BLOOD SAMPLINGS AT 1.5, 2.5, 3.5 AND 4.5 HR POSTINJECTION, AND EXTRAPOLATING TO ZERO TIME ON SEMILOG PAPER TO CALCULATE TOTAL BODY WATER. MEAN VALUES OF GROUPS OF 10 PATIENTS IN EACH AGE DECADE ARE TABULATED AS FOLLOWS - AGE GROUPD, MEAN AGE, WT IN KG, SURFACE AREA IN SQ METERS, TOTAL BODY WATER IN LITERS AND PER CENT BODY WATER, FOR MALES - 1 TO 10 YEARS, 5.6 YRS, 21.53 KG, 0.82 SQ.M., 13 LITERS WATER, 64.86 PERCENT WATER - 11 TO 20, 16.4 57.94, 1.64, 37.96, 65.83 - 21 TO 30, 27.2, 77.52, 191, 43.65, 57.54 - 31 TO 40, 34.4, 76.9, 1.91 44.6, 57.20 - 41 TO 50, 45.4, 69.64, 1814, 39.24, 56.39 - 51 TO 60, 53.5, 70.81, 1.825, 40.47, 57.39 - 61 TO 70, 64.2, 70.72, 1.79, 37.89, 54.49 - 71 TO 80, 73.1, 69.86, 1.776, 35.26, 52.2 - 81 + 83.6, 59.61, 166, 29.51, 49.84.

OXIDE + *WATER + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + EFFECT, AGE + IMMATURE + MAN + MATURE + NEWBORN + AGED + *WHOLE BODY + FEMALE + YOUNG + MALE + INFANT

056410
SIMPSON JW
JCAE ROUND TWO - THE SCIENTIFIC GAMUT
1 PAGE, INFO, FEBRUARY 1970 (SUPPLEMENT)

PRES. OF WESTINGHOUSE POWER SYSTEMS REVEALED TWO JOINT STUDIES OF WASTE HEAT USE - WITH CON. ED. OF N.Y. ON UTILIZATION FOR URBAN USE, AND WITH COMMONWEALTH EDISON ON POTENTIAL BENEFICIAL USE IN AQUACULTURE. EX. DIR. OF NAT. WILDLIFE FEDERATION SAYS A POLL SHOWS 75 PERCENT OF PUBLIC WOULD PAY UP TO 25 CENTS/MON. MORE ON THEIR UTILITY BILLS TO CLEAN UP ENVIRONMENT. HE STATED THAT THIS WAS ENOUGH TO HANDLE PROBLEM (HOSMER DISAGREED). E. RADFORD WHO OPPOSED CALVERT CLIFFS ON TRITIUM PROBLEM NOW STATES HE WOULD CERTIFY PLANT AS BEING SAFE, ALTHOUGH HE STILL

056410 *CONTINUED*
FEARS TRITIUM FROM REPROCESSING PLANTS. V. BOND (DISPUTING RADFORD ON SEVERAL POINTS) STATED THAT GIVEN DOSE OF BETA RAYS OF TRITIUM (INHALATION OR INGESTION) IS SAME AS DOSE FROM X-RAYS OR GAMMA RAYS -- NO ADDED SIGNIFICANCE OR HAZARD TO BE ATTACHED TO FACT THAT DOSE IS DERIVED FROM TRITIUM.

*ECOLOGY + CONGRESSIONAL ACTIVITY + DOSE + ECONOMICS + *CONTROL + REACTOR, POWER + FUEL REPROCESSING + *THERMAL POLLUTION + CALVERT CLIFFS 1 (PWR) + RADIATION EFFECT + INDUSTRY, NUCLEAR + BENEFICIAL USE, AGRICULTURE + BENEFICIAL USE, SPACE HEATING + WASTE HEAT, WATER + INDUSTRY, UTILITY + ORGANIZATION, CITIZEN + SPOKESMAN, ACADEMIC + SPOKESMAN, AEC + CONGRESSMAN

061912
BARBER DE
MAXIMUM PERMISSIBLE CONCENTRATION FOR TRITIATED WATER AND TRITIATED THYMIDINE
UNIVERSITY OF MINNESOTA, MINNEAPOLIS
5 PAGES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, VOL. 30, PG. 514-518 (SEPTEMBER-OCTOBER 1969)

THE ELECTRONS OF IMPORTANCE BIOLOGICALLY IN THE ABSORPTION OF ENERGY FROM BETA PARTICLES EMITTED BY TRITIUM HAVE ENERGIES BELOW 1 KEV. THESE ELECTRONS HAVE EXTREMELY SHORT RANGES THAT PROMPT THE EXAMINATION OF ABSORBED ENERGY ON SOME BASIS OTHER THAN AVERAGE DOSE, SUCH AS ERGS/GM. TENATIVE MPCS FOR TRITIATED WATER AND TRITIATED THYMIDINE ARE DERIVED IN THIS PAPER WITHOUT REFERENCE TO ABSORBED DOSE. THE MPCS THUS OBTAINED ARE 10 TO 100 TIMES PRESENT RECOMMENDED VALUES.

*MPC + *WATER + BETA EMITTER + ABSORPTION + PHYSIOLOGY/METABOLISM + MAN + *THYMIDINE

057579
VAUBERT, B + BITTEL, R
THE HAZARD FROM TRITIUM CONTAMINATION
CENTRE D/ETUDES NUCLEAIRES DE FONTENAY-AUX-ROSES, FRANCE
CEA-BIB-182 + EUR-4522F +. 1970

CONTENTS - OBJECTIVE OF THIS REPORT. NUCLEAR CHARACTERISTICS. FORMATION AND ASSOCIATED HAZARDS. BEHAVIOR VIS-A-VIS HYDROGEN, OXYGEN, WATER AND VARIOUS ORGANICS OF BIOLOGICAL IMPORTANCE. RADIOCHEMISTRY. EXCHANGE REACTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BIBLIOGRAPHY + OCEAN AND SEA + RADIATION IN PERSPECTIVE + *HAZARD, RELATIVE + RIVER + *LAKE + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER

057580
PLANET, J + UZZAN, G + LE GRAND, J
RADIATION EXPOSURE TO MAN FROM DISPOSAL OF TRITITIATED WATER VAPOR TO THE ATMOSPHERE
CENTRE D/ETUDES DE NUCLEAIRES, FONTENAY-AUX-ROSES, FRANCE
CEA-CONF-1560 +. CONF-700505-11 +. 25 PAGES, 1970, PRESENTED AT THE INTERNATIONAL RADIATION PROTECTION ASSOCIATED CONGRESS, BRIGHTON, ENGLAND

BOTH CONTAMINATION BY INHALATION AND INGESTION OF FOODS (DRINKING WATER, VEGETABLES, ANIMAL PRODUCTS) ARE CONSIDERED. THE STUDY SHOWED THAT IN CERTAIN CASES THE DOSE THROUGH INGESTION OF MILK IS APPRECIABLE FOR INFANTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FRANCE + WASTE DISPOSAL, ATMOSPHERIC + *MILK + WATER, DRINKING + CONTAMINATION + BIOACCUMULATION/TURNOVER + FOOD CHAIN + MAN + *FOOD

058835
WADE L + SHAW EI
PRELIMINARY ESTIMATE OF THE HAZARD FROM INGESTION OF TRITIATED THYMIDINE
UNIVERSITY OF KANSAS, LAWRENCE
13 PAGES, 5 FIGURES, 3 TABLES, 22 REFERENCES, RADIATION RESEARCH, VOL. 43, PG 403-415 (1970) (T7334)

FOR ESTIMATING HAZARD TO MAN OF INGESTED TRITIATED THYMIDINE, ASSUMPTIONS MADE WERE (1) THAT MAN IS A MOUSE METABOLICALLY, (2) THAT ALL THE NONVOLATILE TRITIUM (-10 DEG C FREEZE-DRY) IS LOCATED IN THE NUCLEUS, (3) THAT THE VOLATILE TRITIUM IS WATER AND UNIFORMLY DISTRIBUTED, (4) THAT ACTIVITY IN EACH TISSUE DECREASES EXPONENTIALLY WITH TIME, (5) THAT TISSUE ACTIVITY REMAINS CONSTANT DURING 1ST 24 HOURS AFTER STOMACH-TUBE ADMINISTRATION. NUCLEAR RADIUS OF DIFFERENT ORGAN CELLS (2.8 TO 5.0 MICRONS) AND CELL VOLUMES WERE MEASURED FROM PHOTOMICROGRAPHS IN AN ATLAS OF ULTRASTRUCTURE, BY RHODIN, SAUNDERS (1963). FASTED 10-20 WEEK-OLD MICE (17-31 G) WERE GIVEN 1 OR 10 MICROCURIES (SP. ACT. 1.9 CURIES/MILLIMOLE) BY STOMACH TUBE OR SC. NONVOLATILE TRITIUM IN MICROCURIES TIMES 10 (EXP -7) PER MG WET TISSUE AT 1,2,4,8,16,30,60 DAYS, RESPECTIVELY ARE GIVEN IN ORDER OF KEYWORD ORGANS LISTED BELOW AS FOLLOWS FOR 10 MICROCURIE INGESTION - 21, 14, 13,9.0,.5.2, 1.5, 0.80, - 45, 42, 30, 15, 6.2, 4.5, 2.4 - 40, 26, 16, 9, 3.1, 1.9, 2 - 27, 15, 19, 7, 3, 2, 0.08 - 80, 79, 28, 11, 2.2, 1.3, 1.1 - 100, 70, 30, 14, 3, 1.8, 1.3. ALSO 1 MICROCURIE TO WHICH DATA THE DESIRED RETENTION FUNCTIONS CAN BE FITTED. EFFECT AT 15 RADS TO NUCLEUS OBSERVED.

INGESTION + HAZARD, RELATIVE + *DOSE CALCULATION, INTERNAL + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE +

058835 *CONTINUED*
PHYSIOLOGY/METABOLISM + TOXICITY + DISTRIBUTION + DNA + *CELL, NUCLEUS + MAMMAL, MOUSE + EXPOSURE, SC + KIDNEY + LIVER + MATURE + MUSCLE + INTESTINE, SMALL + SPLEEN + TESTIS + MALE + ORGANIC + *RETENTION FUNCTION + DISTRIBUTION, MICRO + EFFECT, DOSE + MONTH + THYMIDINE

060933
MINDER W
INTERNAL CONTAMINATION WITH TRITIUM
EIDGENOESSISCHES GESUNDHEITSAMTES, BERN
5 PAGES, STRAHLENTHERAPIE, VOL. 137, PG. 700-704 (JUNE 1969)(IN GERMAN)

REPEATED AND LONG LASTING INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS IN AIR LED TO VERY SERIOUS CONTAMINATION EFFECTS WITH FATAL CONSEQUENCES IN ONE CASE. STUDIES OF TRITIUM CONTENT IN URINE DURING 16 MONTHS AFTER STOPPING WORK WITH RADIOACTIVE MATERIAL SHOWED AT LEAST TWO DIFFERENT ELIMINATION VELOCITIES, ONE CORRESPONDING TO BIOLOGICAL HALF LIFE OF MORE THAN FOUR MONTHS, THE OTHER OF THE ORDER OF MAGNITUDE OF WEEKS. DEFINITE FIGURES WERE RATHER STRONGLY INFLUENCED BY THE MODE OF CALCULATION. IN ALL INVESTIGATED ORGANS, TRITIUM WAS BOUND IN A FORM COMPLETELY INSOLUBLE IN WATER.

*INCIDENT, EXPOSURE + *INHALATION + *DOSE CALCULATION, INTERNAL + INCIDENT, FATALITY + BIOLOGICAL HALF-LIFE + CONCENTRATION + EXCRETION, URINE + *ORGAN

061130
BASSON JK + VANAS D + VLEGGAAR CM + VANDERWESTHUSIZEN
RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE
11 PAGES, SOUTH AFRICAN JOURNAL OF SCIENCE, 66(7), PP. 214-225

MEASUREMENTS SINCE 1963 WITH SPECIAL ATTENTION TO 1966-67 SHOWED THE FRENCH NUCLEAR TESTS DID NOT PRODUCE A HAZARDOUS INCREASE. ANALYSES OF AIRBORNE FALLOUT, SR-90 IN MILK, CS-137 IN BONE, TRANSIT TIME AND AGE ANALYSIS, THE RATIO OF CE-144/CS-137 INDICATED FALLOUT AGE, AND SHOWED FALLOUT TOWARDS THE END OF 1966. INCREASES IN CUMULATIVE SR-90 DEPOSITION AND H-3 IN RAIN WERE ATTRIBUTABLE TO INTERHEMISPHERIC MIXING. THE AVERAGE DOSE RATE FOR THE POPULATION WAS CALCD. TO BE 0.9 MRAD/YEAR TO GONADS AND 3.3 TO THE BONE MARROW. (CA 74-10119 N)

CERIUM + CESIUM + *FALLOUT + STRONTIUM + DOSE CALCULATION, INTERNAL + *POPULATION EXPOSURE + *SOUTH AFRICA + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + BONE, MARROW + TESTIS

061721
PLANET J + UZZAN G + LE GRAND J
HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER
CEA, FONTENAY-AUX-ROSES, FRANCE
2 PAGES, HEALTH PHYSICS, VOL. 19, PP. 100-102 (1970)

CONTAMINATION MECHANISMS ARE (1) INHALATION AND SKIN ABSORPTION AND (2) INGESTION OF CONTAMINATED FOOD. THE DOSE TO POPULATIONS WAS ESTIMATED BY CONSIDERING DISPERSION IN THE AIR AS A FUNCTION OF METEOROLOGICAL CONDITIONS, CONTAMINATION OF RAIN BY WASHOUT FROM THE ATMOSPHERE, CONTAMINATION OF THE WATER TABLE, CONTAMINATION OF VEGETABLE PRODUCTS TAKING INTO ACCOUNT THE EXCHANGE OF WATER IN THE VAPOUR PHASE BETWEEN THE ATMOSPHERE AND THE EXPOSED PARTS OF PLANTS, OF THE FOLIAR ABSORPTION OF TRITIATED WATER, AND OF UPTAKE THROUGH THE ROOTS, CONTAMINATION OF MILK AND MEAT FROM PASTURE AND FROM THE METHOD OF REARING LIVESTOCK.

*INHALATION + RAINOUT + *WASTE DISPOSAL, ATMOSPHERIC + MILK + WATER, DRINKING + ABSORPTION + RADIONUCLIDE UPTAKE + *FOOD CHAIN + LIVESTOCK + MAN + SKIN

061931
BUTLER HM + HAYWOOD FF
RADIATION SAFETY PRACTICES - OPERATION HENRE
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CEX-65.05 +. 34 PAGES, APRIL 1970

DURING 1967 AN EXPERIMENT WAS CONDUCTED AT THE NEVADA TEST SITE USING A HIGH-YIELD-NEUTRON GENERATOR SUPPORTED AT SEVERAL ELEVATIONS ON A 1527-FT STEEL TOWER. NUMEROUS PERSONNEL RADIATION HAZARDS WERE ASSOCIATED WITH THE ROUTINE OPERATION OF THIS GENERATOR, AND SPECIALIZED EQUIPMENT AND PROCEDURES WERE REQUIRED. THE MOST NOTABLE HAZARD RESULTED FROM HANDLING TARGETS FOR THE GENERATOR, EACH OF WHICH CONTAINED 1500 TO 2000 CI OF 3H. HANDLING WAS REQUIRED FOR TARGET FABRICATION, PACKING AND SHIPPING, MOUNTING ONTO GENERATOR, REMOVAL AND TRANSFER TO STORAGE, AND DISPOSAL OF WASTES. THIS REPORT INCLUDES AREA MONITORING AND BIO-SAMPLING TECHNIQUES, INTERNAL-DOSE ESTIMATION, AND SPECIFIC PROCEDURES FOR LIMITING PERSONNEL EXPOSURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HAZARD, RELATIVE + *TESTING + TRANSPORTATION AND HANDLING + *WASTE DISPOSAL + WASTE STORAGE + SAMPLING + DOSE CALCULATION, INTERNAL + *NEVADA TEST SITE + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + MONITOR, AREA

062563
WYLIE KF + BIGLER WA + GROVE GD
BIOLOGICAL HALF-LIFE OF TRITIUM (T7377)
MONSANTO RESEARCH CORPORATION, MOUND LABORATORY, OHIO
4 PAGES, 2 FIGURES, 1 TABLE, 11 REFERENCES, HEALTH PHYSICS, VOL. 9, PP. 911-914 (1963)

X SNYDER ET AL, PHYS MED BIOL 13, 547 (1968) MADE A 2-EXPONENTIAL FIT TO AN ACCIDENTAL HUMAN EXPOSURE, GIVING RESPECTIVE BIOLOGICAL HALF-LIVES OF 9 AND 34 DAYS. THOMPSON, JBC 197, 81 (1952) FOUND 9 AND 90 DAY BIOLOGICAL HALF LIVES FOR MICE. THE PRESENT AUTHORS FIND AN AVERAGE BIOLOGICAL HALF-LIFE OF 8.5 DAYS OVER THE 50-DAY URINARY MEASUREMENT PERIOD STUDIED FOR 6 MALE WORKERS WHO INADVERTENTLY INHALED TRITIATED-VAPOR. THE LOWEST HALF-LIFE FOR THE PERIOD OF STUDY WAS 6.4 +- 0.6 DAYS AND THE LONGEST WAS 12.1 +- 0.7. THE CORRESPONDING BODY WTS FOR THESE TWO SUBJECTS WERE 64.7 AND 73.4 KG, TOTAL BODY WATER 33.1 AND 47.0 LITERS AND AVERAGE DAILY WATER OUTPUT OF 3.6 AND 2.7 LITERS.

WATER + PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + EXCRETION, URINE + MAN + MATURE + WHOLE BODY + MALE + RETENTION FUNCTION + MONTH

062587
MOSKALEV YI + SHTUKKENBERG YM + ZHURAVLEV VF
RECOMMENDATIONS ON MAXIMUM PERMISSIBLE CONCENTRATION IN AIR OF INDUSTRIAL PREMISES FOR TRITIUM OXIDE
5 PAGES, GIGIENA TRUDE I PROFESSIONALNYE ZABOLEVANIIA/MOSCOW, VOL. 13, PP. 39-43 (1969)

X NO ORIGINAL DATA. AUTHORS CONSIDER AS OF MARCH 1967 THAT THE USSR STANDARD OF 2 X 10 (EXP-8) CURIES/LITER FOR 40-HR WEEK (MPC)A SHOULD BE CHANGED TO THE ICRP (1959) RECOMMENDATION OF 5 X 10 (EXP-9) FOR THE AIR OF INDUSTRIAL PREMISES, WITH A URINARY LEVEL OF 3 X 10 (EXP-8) CURIES PER ML OF URINE. REVIEW OF RBE EVALUATION AND OF DOSE CALCULATION FOR TRITIATED WATER VAPOR INHALATION AND SKIN ABSORPTION ON ASSUMPTIONS THAT (1) 98 PERCENT OF TRITIATED WATER GETTING TO THE BODY ENTERS WATER COMPARTMENT, 2 PERCENT IN THE SOLID COMPARTMENT (SIRI AND EVERS, TRITIUM IN PHYS AND BIOL SCIENCES 2, 71 (1962), IAEA)), (2) ABSORPTION RATE OF HTO THROUGH SKIN IS 0.029 TO 0.065 MICROCURIES/SQ CM, AND SAME ORDER OF MAGNITUDE FOR LUNG ABSORPTION, (3) TOTAL BODY WATER OF A HEALTHY ADULT HUMAN IS 42 LITERS, (4) A HEALTHY ADULT HUMAN IS 42 LITERS, (4) HEALTHY ADULT TAKES IN 2.6 TO 3 LITERS OF FLUID PER DAY AS DRINKING WATER + FOOD WATER + METABOLIC WATER (30 LM), (5) TOTAL BODY WATER EXCEEDS DAILY WATER INTAKE BY A FACTOR OF NOT MORE THAN 14 TO 17, (6) 1500 ML WATER ELIMINATED VIA URINE, 200 ML VIA STOOLS, 750 TO 1000 ML VIA SKIN AND EXPIRED AIR, (7) RECOMMENDED RBE OF 3 FOR HTO, (8) 8000 LITERS OF AIR INHALED PER SHIFT. MAX DAILY INTAKE SHOULD NOT EXCEED 70 MICROCURIES, FOR 5 RADS/YR.

ADSORPTION + *CODES AND STANDARDS + INHALATION + MPBB + *MPC + OXIDE + WATER + AIR + DOSE CALCULATION, INTERNAL + PERSONNEL EXPOSURE, RADIATION + *USSR + *REVIEW + GAS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + TOXICITY + EXCRETION, URINE + INTAKE + MAN + MATURE + RBE + SKIN

062623
LAMBERT BE + CLIFTON RJ
RADIATION DOSES RESULTING FROM ADMINISTRATION OF TRITIATED FOLIC ACID AND TRITIATED WATER IN THE RAT
RADIOLOGICAL PROTECTION SERVICE, BELMONT, SUTTON, SURREY, ENGLAND
7 PAGES, BRITISH JOURNAL OF RADIOLOGY, VOL. 40, PP. 56-61 (1967) (T3892)

FROM RAT ORGAN RETENTION DATA AND ICRP (1959) DOSE LIMITS TO ORGANS, PRESENT AUTHORS CONCLUDE THAT TRITIATED FOLIC ACID (I) IS TWICE AS TOXIC AS TRITIATED WATER (II). REMS/MILLICURIE WERE AS FOLLOWS, FOR I AND II RESPECTIVELY - LIVER 91,16 - KIDNEY 65,16 - MARROW 16,15 - BLOOD 7,16 - WHOLE BODY 12,12. GROUPS OF 6 RATS WERE SACRIFICED FROM 1 HR TO 6 WKS AFTER INJECTING 10 MICROCURIES (SP. ACT. 270 MILLICURIES/MILLIMOLE) OF (I) INTRAVENOUSLY. GROUPS OF 4 RATS WERE GIVEN AN IP DOSE OF 220 MICROCURIES OF (II), AND SACRIFICED FROM 1 TO 30 DAYS POSTINJECTION, AN AMOUNT TOO LOW TO FOLLOW ORGANIC TRITIUM (III) AFTER 30 DAYS. 3 PERCENT OF INITIAL ACTIVITY WAS (III), INCREASING TO 50-70 PERCENT BY 30 DAYS. THOMPSON, JBC 200, 731 (1953), AT THE RISK OF ALTERING METABOLISM BY HIGH DOSE, SUGGESTED A 3RD EXPONENTIAL OF 80 TO 300 DAYS BIOL HALF LIFE AFTER INJECTING 15200 MICROCURIES. PRESENT AUTHORS FOUND PEAK ACTIVITY IN NANOCURIES/GM OF TISSUE AS FOLLOWS - KIDNEY OVER 300 WITHIN 30 MIN - LIVER 180 AT 24 HRS - FAT 82 AT 18 HRS - LYMPH NODE 48 AT 24 HRS - GUT 48 AT 17 HRS - PANCREAS 48 AT 19 - MARROW 51 AT 10 - THYMUS 44 AT 18 - SPLEEN 39 AT 21 - ETC. DOSE WAS CALCD BY THE FORMULA OF VENNART AND MINSKI, BJR 35, 372 (1962). 1 MILLICURIE OF FOLIC ACID GAVE TO LIVER, KIDNEY, MARROW 90,65,15 REMS, RESPECTIVELY - HTO A UNIFORM DOSE OF 12 REMS/MILLICURIE.

OXIDE + WATER + *DOSE CALCULATION, INTERNAL + ICRP + CRITICAL MASS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + *CONCENTRATION + TOXICITY + DISTRIBUTION + ACID + BONE, MARROW + MAMMAL, RAT + EXPOSURE, IP + EXPOSURE, IV + FAT + GI TRACT + KIDNEY + LIVER + LUNG + LYMPH NODE + MATURE + MUSCLE + PANCREAS + SKIN + SPLEEN + TESTIS + WHOLE BODY + ORGANIC + RADIOPHARMACEUTICAL + RETENTION FUNCTION + BRAIN + HEART + MONTH + THYMUS

062687
LOUGH SA
THE NATURAL RADIATION ENVIRONMENT
HEALTH AND SAFETY LABORATORY, NEW YORK
24 PAGES, PG. 405-429 OF RADIATION BIOLOGY AND MEDICINE, READING, MASSACHUSETTS, ADDISON-WESLEY PUBLISHING COMPANY, INC., 195*

DISCUSSES THE VARIOUS IMPLICATIONS OF NATURAL RADIATION WITH RESPECT TO COMPONENTS OF THE ENVIRONEMNT, UNITS OF DOSE, COSMIC AND TERRESTRIAL GAMMA RADIATION, EXTERNAL DOSE DUE TO RADON AND THORON, EXTERNAL BETA RADIATION, INTERNAL LUNG DOSE FROM RADON AND THORON, AND THE NATURALLY OCCURRING RADIOACTIVE MATERIALS OF THE HUMAN BODY.

062687 *CONTINUED*
CARBON + DEPOSITION + DOSIMETRY + INHALATION + *CONCENTRATION, GROUND LEVEL + POTASSIUM + GROSS BETA + GROSS GAMMA + RADIUM + RADON + *DOSE MEASUREMENT, EXTERNAL + MONITOR, BACKGROUND + *COSMIC RADIATION + *DOSE MEASUREMENT, INTERNAL + *ENVIRONMENT + THORON + CONCENTRATION + LUNG + WHOLE BODY

062726
BALLEREAU P
OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS
COMMISSARIAT A L/ENERGIE ATOMIQUE, BRUYERES-LE-CHATEL (FRANCE)
CEA-BIB-179 +. 65 PAGES, NOVEMBER 1970

TRITIATED WATER IS THE MOST HAZARDOUS SPECIES OF TRITIUM. IN PRESENCE OF AIR, TRITIUM AND ITS COMPOUNDS CAN BE CONVERTED INTO OXIDE BY TWO REACTIONS INDEPENDENT FROM EACH OTHER - (A) SELF-OXIDATION BY THE BETA RADIATION EMITTED, (B) ISOTOPIC EXCHANGE BETWEEN GASEOUS 3H AND THE 1H ATOMS OF WATER VAPOUR. KNOWLEDGE OF CONDITIONS AND RATE CONSTANTS FOR THE CONVERSION OF TRITIUM IN TRITIATED WATER IS NECESSARY FOR THE PROTECTION OF WORKERS IN A TRITIATED ENVIRONMENT. THIS BIBLIOGRAPHY, WHICH PROVIDES A THOROUGH STUDY OF THE UNHAPPILY TOO RARE PUBLISHED MATERIALS, ENABLES TO SHOW THAT THE DATA, PRESENTLY AVAILABLE, ARE INADEQUATE AND THAT FURTHER EXPERIMENTAL WORK MUST BE CARRIED OUT TO CONFIRM THEM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIBLIOGRAPHY + OXIDATION + *ENVIRONMENT + WATER VAPOR

064725
BUSH WR
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER NUCLEAR LABORATORY, CANADA
AECL-2756 +. 17 PAGES, 6 FIGURES, 3 TABLES, 7 REFERENCES, 1967

MOST OF THE EXPOSURES RESULTED FROM INTAKE OF HTO VAPOUR THROUGH THE UNWETTED SKIN OF MEN WEARING AIR-SUPPLIED MASKS AND COTTON OVERALLS, WHERE DTO IS EXPOSED TO THE AIR IN VICINITY OF THE NRU REACTOR WHICH IS WATER-COOLED, D2O MODERATED. AVERAGE HTO ABOVE THE REACTOR WAS 0.17 (MPC)A IN 1964-5, A STANDARD MAN RECEIVING 850 MREM/YR FROM SUCH A CONCN, 40 HR/WK, BUT SINCE REAL MEN ABSORB HTO ONLY HALF AS FAST (NSIC NO. 56159), AND WORK 30 HR/WK, THEY SHOULD HAVE RECEIVED 320, BUT ACTUALLY GOT 120 MREM/YR, IN AREAS AVERAGING LESS THAN OVER THE REACTOR, 5000 MREM/YR BEING THE LIMIT SET BY CANADIAN LAW. AVERAGE DOSES TO NRU OPERATING PERSONNEL IN 1966 WERE 700 MREM FROM HTO + 1.2 R FROM GAMMA RAYS, AVERAGE HTO DOSE RECEIVED BY 50 MEN REMOVED FROM EXPOSURE AREAS BEING 230 MREM. MEN ARE REMOVED FROM FURTHER HTO EXPOSURE IF THEIR URINE CONTAINS 20 MICROCURIES PER LITER OR MORE AND KEPT AWAY UNTIL URINE LEVEL DROPS TO 6 UCI/L (USUALLY 3 WKS). MEN WITH 7 TO 10 UCI/L ARE CLASSIFIED AS HAVING MINOR HTO CONTAM. AIR-SUPPLIED MASKS WORN IF ANTICIPATED DAILY EXPOSURE EXCEEDS 8(MPC)A HOURS, BUT NOT ALWAYS WHEN HTO CONCN WAS ONLY 2 OR 3 PICOCURIES PER LITER OF D2O. ROUGHLY EQUAL AMTS OF HTO ARE ABSORBED THROUGH SKIN AND LUNGS, 16(MPC)A-HOURS PERMISSIBLE WITH MASKS.

CANADA + CODES AND STANDARDS + OXIDE + DOSE CALCULATION, INTERNAL + PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *EXCRETION, URINE + EXPOSURE, SKIN + MAN + LEGISLATION

064727
PINSON EA + LANGHAM WH
PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (T0226)
UNIVERSITY OF CALIFORNIA, LOS ALAMOS SCIENTIFIC LABORATORY
19 PAGES, JOURNAL OF APPLIED PHYSIOLOGY, VOL. 10, PP. 108-126 (1957)

TRITIUM WAS DISCOVERED IN 1939. THIS INDUSTRIAL HEALTH HAZARD STUDY MEASURES (1) ENTRY RATES OF HT AND HTO BY INGESTION, INHALATION AND SKIN ABSORPTION INTO THE BODY, (2) DISTRIB AND RETENTION IN BODY COMPARTMENTS AND TISSUES, (3) EXCRETION RATE OF TRITIUM. SUBJECT EAP INGESTED 100,200,1000 ML OF WATER CONTAINING 1640, 1640, 2920 UCI OF HTO RESPECTIVELY, TO GIVE BODY DILUTION VOLS IN % OF BODY WT AS FOLLOWS - 62,58,62. CORRESPONDING VALUES FOR WHL WERE 100 ML WATER CONTAINING 1640 UCI HTO TO GIVE 62 AND FOR JS 1000,1640,67. SUBJECT WTS WERE 66,60,69 KG RESP. WATER TRANSFERRED FROM GI TRACT TO BLOOD PER UNIT TIME WAS PROP TO VOL INGESTED, VENOUS BLOOD ACTIVITY STARTING 2 TO 9 MIN POSTINGESTION, MAX IN 40 TO 45 MIN, IN AGREEMENT WITH DEUTERIUM DATA OF RITTENBERG, JBC 184,687(1950). 2.5 HR EQUIL ACTIVITIES WERE USED TO CALC ABOVE BODY DIL VOLS, WHICH WERE IN GOOD AGREEMENT WITH SCHLOERB, J CLIN INV 29,1296(1950). SUBJECTS THEN INHALED FOR 4 TO 5 MIN O2 SATD WITH HTO VAPOR BY PASSING THROUGH WATER CONTAINING 1.32 MCI HTO/ML OF HHO. HTO IN BODY FLUIDS AT EQUIL RANGED FROM 22 TO 27 UCI/L, BODY DILUTION VOL FROM 37 TO 46 L, CALCD INCREASE OF HTO IN BODY FROM 819 TO 1080 UCI, HTO INSPIRED FROM 830 TO 1083, 97 TO 100% OF INHALED HTO REACHING THE BODY FLUIDS. CONTD TO NSIC NO. 64728.

INGESTION + INHALATION + MPC + OXIDE + WATER + THERMAL CONSIDERATION + ICRP + PERSONNEL EXPOSURE, RADIATION + GAS + LIQUID + ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + RESPIRATION + PHYSIOLOGY/METABOLISM + BLOOD + EXCRETION, URINE + EXPONENTIAL FUNCTION + *FAT + *GI TRACT + *INTAKE + MAN + MATURE + RBE + *SKIN + MALE + BODY FLUID + HOUR + METABOLIC KINETICS

064728
PINSON EA + LANGHAM WH
PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (T0226)
19 PAGES, JOURNAL OF APPLIED PHYSIOLOGY, VOL. 10, PP. 108-126 (1957)

064728 *CONTINUED*
CONTD FROM NSIC NO. 64727. FOREARM SKIN ABSORPTION OF 3 HUMAN SUBJECTS EXPOSED TO ATMOS SATD WITH HTO VAPOR AT 24 DEG C FROM 1 TO 61 MIN RANGED FROM 0.0044 TO 0.017 MG/CM2/MIN WITH FROM 180 TO 1680 UCI OF HTO ABSORBED. EFFECTS OF WATER AND ALCOHOL RINSES STUDIED, AND OF TEMP, ON SKIN ABSORPTION. AV SKIN ABSORPTION AT 24 DEG C AT GREATER THAN 15 MIN 0.018 MG/CM2/MIN, COMPARABLE TO RATE OF INSENSIBLE PERSPIRATION. HTO IN DRY HUMAN SKIN OR FAT BIOPSIES AFTER 8 MONTHS CHRONIC EXPOSURE TO HTO THROUGH SKIN, LUNGS AND GI TRACT RANGED FROM 200 TO 500 PICOCURIES/KG DRY WT, BODY FLUID ACTIVITY RANGING FROM 6 TO 70 UCI/L, EQUIV TO 0.05 RAD/WK WHOLE-BODY RADIATION. AUTHORS CALCULATE 62.2% OF BODY WT OF 70 KG MAN TO BE TOTAL BODY WATER (RATHER THAN 71% GIVEN BY ICRP), AND 20% FAT. ADDNL HUMAN DATA. RAT OXIDIZED HT TO HTO 50 TIMES FASTER THAN MAN PER KG OF BODY WT. MICE WERE GIVEN 4.14 UCI/ML OF HTO IN DRINKING WATER FOR 5 MONTHS, BODY FLUIDS 2880 UCI/L, THEN NORMAL WATER INTAKE FOR 32 DAYS, AND DRIED TISSUES BURNED TO GIVE FOLLOWING WATER OF COMBUSTION ACTIVITY IN UCI/L AVERAGE FOR 3 MICE - BRAIN 263, SKIN 183, MUSCLE 135, HEART 94, BONE 91, SPLEEN + THYMUS 67, GI TRACT 49, FAT 49, KIDNEY 48, LIVER 27, URINE 4. ADDNL RAT AND MOUSE DATA.

INGESTION + INHALATION + OXIDE + DOSE CALCULATION, INTERNAL + CORRELATION + GAS + LIQUID + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + TOXICITY + DISTRIBUTION + BONE + MAMMAL, MOUSE + MAMMAL, RAT + *EXPOSURE, CHRONIC + EXPOSURE, IP + FAT + GI TRACT + KIDNEY + LIVER + MUSCLE + SKIN + SPLEEN + BODY FLUID + BRAIN + HEART + MONTH + THYMUS

064729
BIRO T + CZIBOLY C
DETERMINATION OF INTERNAL RADIATION DOSES FOR TRITIUM INTAKE (T5547)
5 PAGES, 1 FIGURE, 1 TABLE, 7 REFERENCES, PP. 93-97 OF THE PROCEEDINGS OF THE II. SYMPOSIUM ON HEALTH PHYSICS, PECS, HUNGARY, SEPTEMBER 26-30, 1966

MOST FREQUENT FORMS OF TRITIUM UPTAKE BY WORKERS AT THE HUNGARIAN INSTITUTE OF ISOTOPES WHERE ABOUT 100 TRITIUM-LABELED COMPOUNDS ARE SYNTHESIZED ARE TRITIATED HYDROGEN GAS AND TRITIATED WATER VAPOR BY INHALATION OR SKIN ABSORPTION. TRITIATED WATER TAKES LESS THAN 1 HR TO EQUILIBRATE IN ALL BODY FLUIDS. A PERMANENT BODY BURDEN OF 1.2 MILLICURIES OF TRITIUM HOMOGENEOUSLY DISTRIBUTED DELIVERS 5 REM ANNUAL DOSE TO THE 43 KG OF SOFT TISSUE IN STANDARD MAN. THE MPBB IS 1 MILLICURIE OF TRITIUM, CORRESPONDING TO 23 MICROCURIES/LITER SPECIFIC ACTIVITY IN BODY FLUIDS INCLUDING URINE. BODY BURDEN USUALLY DETERMINED FROM URINE OR EXHALED WATER VAPOR, 0.05 UCI/L MINIMUM DETECTABLE BY METHOD USED, INVESTIGATION LEVEL BEING 3 MICROCURIES/LITER OF URINE OR GREATER. 2 WORKERS ACCIDENTLY EXPOSED TO TRITIUM GAS (TT) GAVE URINARY FUNCTIONS OF 38 E (EXP -0.0578T) AND 141 E (EXP -0.0990T) RESPECTIVELY FOR THE 1ST 50 DAYS MEASURED. A 3RD WORKER EXPOSED TO TRITIATED WATER (HTO) GAVE 120 E (EXP -0.0521T) DURING THE SAME TIME PERIOD. ROUTINE MONITORING OF 12 PERSONS ENGAGED IN CHEMICAL SYNTHESIS FOR 2 YRS GAVE IN SOME CASES 1.4 TO 8.4 UCI/L OR 30 MREM/WK (0.25 TO 1.5 REM/YR) MAXIMUM.

MPBB + OXIDE + ANALYTICAL TECHNIQUE + DOSE CALCULATION, INTERNAL + HUNGARY + PERSONNEL EXPOSURE, RADIATION + GAS + LIQUID + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *EXCRETION, URINE + *EXPONENTIAL FUNCTION + MAN + MONTH

064730
JONES HG + LAMBERT BE
RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS (T0257)
12 PAGES, 1 FIGURE, 4 TABLES, 9 REFERENCES, PP. 419-430 OF THE PROCEEDINGS OF THE SYMPOSIUM ON THE ASSESSMENT OF RADIOACTIVE BODY BURDENS IN MAN HELD BY THE INTERNATIONAL ATOMIC ENERGY AGENCY AT HEIDELBERG, MAY 11-16, 1964

4 FIRMS, LARGE-SCALE USERS OF TRITIATED COMPOUNDS, WERE MONITORED BY THE RADIOL PROT SERVICE AND ALL EMPLOYEES FOUND TO HAVE URNINARY TRITIUM, ONE OVER 6 TIMES THE MAX PERMISSIBLE BURDEN OF 1 MILLICURIE TO BODY WATER WHICH IS ASSUMED TO BE 43 KG EVENLY DISTRIBUTED THROUGHOUT THE 70 KG STANDARD MAN AND WHICH DELIVERS ABOUT 5 REMS/YR TO BODY WATER (TISSUES CONTAINING THIS WATER) AND CORRESPONDS TO 0.023 UCI/ML OF URINE. UNFORTUNATELY, ICRP2 (1959) HAS ANOTHER MAX PERMISSIBLE BODY BURDEN OF 2 MILLICURIES OF TRITIATED WATER FOR THE WHOLE BODY CORRESPONDING TO 0.046 UCI/ML OF URINE, SINCE ICRP COULD NOT AGREE ON WHICH SHOULD BE CONSIDERED THE CRITICAL TISSUE (BODY WATER OR WHOLE BODY), NOR DID ICRP2 (1959) GIVE GUIDANCE ON OTHER TRITIATED COMPDS. BEFORE IMPROVEMENTS, THE LUMINIZING ROOM OF FACTORY X CONTAINED EXACTLY 1 (MPC)A, 40-HR WK, 5 X 10 (EXP -6) UCI/CM3, CORRESPONDING TO 1 MCI MPB TO BODY WATER, AND AFTER IMPROVEMENTS 5.7 X 10 (EXP -7) UCI/CM3. MISS A REMOVED FOR 10 DAYS FROM LUMINIZING ROOM GAVE A BIOL HALF-LIFE (TB) OF 12.1 AND HRS, 8 13.4 DAYS. HAZARD INHAL RATHER THAN INGESTION AND PROBABLY HTO RATHER THAN HT, TT, OR TRITIATED ORGANIC COMPOUND. PHYSICOCHEM FORM NOT SPECIFIED. RADIUM STATISTICS BY BE GODFREY (PERSONAL COMMUNICATION).

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

*MPBB + MPC + *UNITED KINGDOM + *INDUSTRY, MANUFACTURING + RADIUM + STATISTICAL FLUCTUATION + ICRP + PERSONNEL EXPOSURE, RADIATION + CORRELATION + SOLID + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + LUMINARY + *EXCRETION, URINE + *EXPONENTIAL FUNCTION + MAN + WHOLE BODY + INORGANIC + ORGANIC + BODY BURDEN + PHYSICOCHEMICAL FORM + WEEK

064731
BRUNNER H
SURVEY OF AVAILABLE DATA ON TRITIUM (T0915)
8 PAGES, PP. 10-16 OF SEMINAIRE SUR LA PROTECTION CONTRE LES DANGERS DU TRITIUM, APRIL 16-18, 1964

PHYSICAL DATA - AVERAGE ENERGY OF THE BETAS 5.5 KEV, MAX 18.0 - MAX RANGE IN TISSUE 6 MICRONS, 90%

064731 *CONTINUED*
OF ALL BETAS ABSORBED WITHIN 1 MICRON, BREMSSTRAHLUNG ENERGY IN WATER 0.00025 KEV - SPECIFIC ACTIVITY 9800 CURIES/GM - RADIOL HALF-LIFE 12.3 YRS. CHEMICAL DATA - TT DISSOCIATION ENERGY 4.59 EV - IONIZATION ENERGY OF T 13.55 EV - 1 TRITIUM UNIT (TU) DEFINED AS 1 T ATOM PER 10 (EXP +18) H ATOMS - TRITIUM CONTENT OF RAIN AND RIVERS BEFORE 1954 4 TU, AFTER 1954 20 TO 500 TU - G VALUES (MOLECULES DEGRADED PER 100 EV) FOR ALCOHOL, CARBONIC ACID, AMINO ACIDS RESPECTIVELY 4 TO 12, 5, 2 TO 30. RADIOLOGICAL DATA - ENERGY LOSS BY IONIZATION IN TISSUES 3.36 KEV/MICRON, AVERAGE NUMBER OF IONIZATIONS 47 PER MICRON, AVERAGE DISTANCE BETWEEN IONIZATIONS 0.02 MICRON - SINGLE TRITIUM DISINTEGRATION GIVES AN AVERAGE OF 53.5 RADS TO THE INNER 0.5 MICRON RADIUS AND 5.8 RADS TO THE NEXT 0.5 MICRON SHELL... - 1 UCI/GM OF T IN A 500 CUBIC MICRON CELL NUCLEUS PRODUCES AN ABSORBED DOSE RATE OF ABOUT 12 MRADS/HR. BIOLOGICAL DATA - WATER BALANCE. TOTAL WATER, EXTRACELLULAR WATER, INTRACELLULAR WATER (%), FLUID WATER INTAKE, FOOD WATER INTAKE (ML/DAY), WATER LOSS THROUGH SKIN, LUNGS, URINE, FECES (ML/DAY) ARE AS FOLLOWS - CONTD TO NSIC NO. 64732.

OXIDE + WATER + DOSE CALCULATION, INTERNAL + WATER, DRINKING + PROPERTY, PHYSICAL + *REVIEW + RADIOLOGY + GAS + LIQUID + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + SPECIFIC ACTIVITY + RANGE EXTENSION + ENERGY SPECTRUM + LINEAR ENERGY TRANSFER + MAN + EXPOSURE, BACKGROUND + BODY FLUID

064732
BRUNNER H
SURVEY OF AVAILABLE DATA ON TRITIUM (T0915)
PAPER FROM SEMINAIRE SUR LA PROTECTION CONTRE LES DANGERS DU TRITIUM, APRIL 16-18, 1964

CONTD FROM NSIC NO. 64731. WATER BALANCE DATA FOR MALE AND FEMALE, RESPECTIVELY, AS FOLLOWS - 60.55 - 15.15 - 45.40 - AND FOR MALE ONLY STARTING WITH FLUID WATER INTAKE, 1500 - 1000 - 500 - 400 - 1500 - 100. AUTHOR CITES 12 DAYS AS AN AVERAGE BIOL HALF-LIFE FROM THE LITERATURE BUT SINGLES OUT WYLIE (NSIC NO. 62563) TB OF 8.5 DAYS. SEE ALSO NSIC NOS. 49550, 49659, 49700, 49702, 56158, 56159, 62587, 64725, 64727, 64729, 64730 FOR DATA ON BIOL HALF-LIFE OF TRITIUM IN MAN. MINDER (NSIC NO. 49549) IN A HUMAN LETHAL EXPOSURE REPORT FOUND A 230 DAY HALF-LIFE FOR 5% AND 30 DAYS FOR 90% CHRONIC INTAKE OF HT OR TT GAS. SNYDER (NSIC NO. 49605) FOUND A 34-DAY HALF-LIFE FOR 2% OF AN ACUTE INTAKE OF HTO. BIOL-HALF-LIFE IS DECREASED BY INCREASED WATER INTAKE (NSIC NO. 64727), 245 HRS AT 2.7 L/DAY AND 57 HRS AT 12.8 L/DAY WATER INTAKE. AUTHOR INDICATES THAT ABSORPTION OF HTO THROUGH SKIN IS AS IMPORTANT AS ABSORPTION VIA RESPIRATION, CITING WENZEL-SCHULZE, TRITIUM-HARKIERUING (1962), BUTLER, NUCLEAR SAFETY 4, 77 (1963), REINIG, AIHAJ 24 276 (1963) - BUT SEE ALSO NSIC NO. 64728 AND DELONG, AM J ROENTG 71, 1038 (1951). AT A CONCN OF 0.01 UCI/CM3, 1 MCI OF HTO IS ABSORBED IN 2 MIN WITHOUT RESP PROTECTION, IN 5 MIN WITH AIR-SUPPLIED MASK ONLY, IN 17 HR IN A 12 MIL AIR-SUPPLIED 1-PIECE PLASTIC SUIT.

MPBB + MPC + OXIDE + DOSE CALCULATION, INTERNAL + *WATER, DRINKING + HAZARDS ANALYSIS + ICRP + PERSONNEL EXPOSURE, RADIATION + *REVIEW + GAS + LIQUID + *EFFECT + *ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + RESPIRATION + PHYSIOLOGY/METABOLISM + EXPOSURE, SKIN + MAN + MATURE + *SKIN + FEMALE + MALE

064733
VERLY WG
CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES
PAPER FROM SEMINAIRE SUR LA PROTECTION CONTRE LES DANGERS DU TRITIUM, APRIL 16-18, 1964 (T0915)

REVIEW OF TRITIATED HYDROGEN GAS (A), TRITIATED WATER (B), TRITIATED THYMIDINE (C), OTHER TRITIATED ORGANICS (D). 0.004% OF (A) GETS OXIDIZED IN THE HUMAN BODY (PINSON, LA-1218 (1951)), AND FOR 0.3 REM/WK TO LUNG THE (MPC)A, 40-HR-WK, IS 0.17 UCI/CM3, THOUGH ANIMALS DIE WITH WHOLE-BODY IRRADIATION SYMPTOMS AND NOT ACUTE LUNG LESIONS, 0.08 UCI/CM3 BEING THE (MPC)A FOR WHOLE-BODY, 0.1 REM/WK (NSIC NO. 64728). INGESTED (B) IS COMPLETELY ABSORBED, BUT INHALATION IS THE MORE COMMON RISK ACCOMPANIED BY SKIN ABSORPTION FROM THE ATMOSPHERE. MPBB OF 1.2 MCI CORRESPONDS TO A SPECIFIC ACTIVITY OF 27 NCI/CM3 OF WATER IN 70 KG STAND MAN WHO CONTAINS 40,000 CM3 OF WATER. 40-HR-WK (MPC)A FOR (B) IS 5 X 10 (EXP -6) UCI/CM3. I.V. (C) DISAPPEARS RAPIDLY FROM PLASMA EVEN BEFORE EQUILIBRATING, 50% OF (C) USED FOR DNA BIOSYNTHESIS BY MITOSING CELLS WITHIN 1/3 HR AND A SMALL % OF B-AMINOISO-BUTYRIC ACID EXCRETION IN URINE WITHIN 24 HURS, REMAINDER CATABOLIZED TO WATER. HUMAN BODY CONTAINS 10 (EXP +12) CELLS, OLIVER, NATURE 186, 91 (1960), UNDERGOING DNA SYNTHESIS, WHICH CAN BE CONSIDERED THE CRITICAL ORGAN, 90% OF THE BETA ENERGY ABSORBED IN A UNIT DENSITY SPHERICAL CELL OF 500 CUBIC MICRON VOL, RBE 1.7, GIVING 15 UCI MPBB, IF UNIFORMLY DISTRIBUTED, CELLS PERMANENTLY LABELED. CONTD TO NSIC NO. 64734.

MPBB + MPC + OXIDE + HAZARD, RELATIVE + WATER + DOSE CALCULATION, INTERNAL + ICRP + *REVIEW + CRITICAL MASS + GAS + LIQUID + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + TOXICITY + DNA + AMINO ACID + MODEL, BIOLOGICAL + MAMMAL, MOUSE + MAN + PROTEIN + INORGANIC + ORGANIC + THYMIDINE

064734
VERLY WG
CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES
6 PAGES, 1 FIGURE, 11 REFERENCES, PP. 117-123, OF SEMINAIRE SUR LA PROTECTION CONTRE DU DANGERS DU TRITIUM, APRIL 16-18, 1964

CONTD FROM NSIC NO. 64733. SOME LABELED CELLS SUBSEQUENTLY MULTIPLY, DILUTING THE TRITIUM (CRONKITE, NATURE 189, 153 (1961)) OR DIE AND THE TRITIUM LIBERATED. LISCO, NATURE 192, 571 (1961), NOTED 50% TUMORS IN 12-MONTH-OLD MICE AFTER A SINGLE DOSE OF 1 UCI TRITIATED THYMIDINE PER GM OF BODY WT, CORRESPONDING TO 70 MCI IN THE WHOLE-BODY OF STANDARD (70 KG) MAN. HOWEVER, INTRAVENOUS INJECTION IS NOT AS LIKELY AN ACCIDENT FOR MAN AS SKIN ABSORPTION + INHALATION. INGESTION WOULD GIVE INTENSE LABELING OF THE INTESTINAL EPITHELIUM MAKING IT THE CRITICAL ORGAN. FOR ORGANIC MOLECULES OTHER THAN THYMIDINE, BASED ON A RITTENBERG STUDY (SPRINSON, JBC 180, 715

064734 *CONTINUED*
(1949)) WITH N15-GLYCINE, THE PRESENT AUTHOR SUGGESTS A 3-COMPARTMENT QUALITATIVE MODEL CONSISTING OF (1) FREE AMINO ACID SPACE, (2) PROTEINS SUBDIVIDED INTO 3 POOLS, (3) TOTAL WATER. SPRINSON AND RITTENBERG GAVE A NORMAL SUBJECT 0.2 GM OF N/KG/DAY, URINARY EXCRETION OF GLYCINE TRITIATED IN THE 2-POSITION NEGLIGIBLE BUT 30% CATABOLIZED TO WATER WITHIN A FEW HRS. REMAINDER INTEGRATED INTO PROTEINS WITH A HALF-LIFE OF 80 DAYS, THESE PROTEINS DIVIDED INTO 3 MAIN POOLS - 40% OF THE H3 FIXED IN LIVER AND PLASMA PROTEINS WITH HALF-LIFE 10 DAYS, 14% IN KIDNEY, SPLEEN, HEART, TESTES, INTESTINE WITH 20 DAYS AND 46% IN LUNG, MUSCLE, SKIN, BRAIN, BONE FOR 158 DAYS.

*REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + TOXICITY + AMINO ACID + BONE + *MODEL, BIOLOGICAL + MAMMAL, MOUSE + KIDNEY + LUNG + MAN + MUSCLE + PROTEIN + SKIN + INTESTINE, SMALL + SPLEEN + TESTIS + *ORGANIC + BLOOD, PLASMA + BRAIN + HEART + MONTH + THYMIDINE

064737
SLATER TF + SAWYER B + STRAULI U
DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)
UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, LONDON, ENGLAND
3 PAGES, JOURNAL OF CLINICAL PATHOLOGY, VOL. 17, PP. 554-556 (1964)

CF NSIC NO. 64736. ENVIRONMENTAL TRITIUM GETTING INTO THYMIDINE OF THE PLANT FOOD CHAIN CAN BE INCORPORATED INTO DNA, RNA, AND PROTEIN OF ANIMALS INCLUDING MAN TO THE EXTENT THAT THYMINE OR THYMIDINE CROSSES THE INTESTINAL MEMBRANE. IF DNA IS THE CRITICAL ORGAN (MOLECULE) FOR THYMIDINE TRITIATED IN ONE OR MORE NONLABILE POSITIONS, THEN DOSE IN VARIOUS ORGANS CAN BE CALCD FROM DNA CONTENT OF THOSE ORGANS IF ORGAN UPTAKE AND RETENTION OF THYMIDINE ARE KNOWN. A 70-KG MAN EATS 100 GM PROTEIN/DAY AND IF ALL OF IT WERE CATTLE OR FOWL LIVER WHICH CONTAINS 20% PROTEIN, THEN LIVER CONTAINING 0.34 MG DNA-P/GM FRESH WT (P CONTENT OF DNA 9.23%) WOULD GIVE A DAILY INTAKE OF 1.84 GM DNA/100 GM PROTEIN CONSUMED AS LIVER, ACCORDING TO H.E. SAUBERLICH, U.S. ARMY MED.RES. AND NUTRITION LAB, FITZSIMONS GEN HOSP, DENVER, COLORADO. PRESENT AUTHORS ANALYZED ORGANS OF 3 MALES (60,70,71 YR) AND 2 FEMALES (18,71 YR) TO GIVE FOLLOWING - ORGAN, MEAN WT OF ORGAN (FROM SPECTOR (1956)), DNA-P IN MG/TOTAL ORGAN WT - LIVER, 1838,186.5 - LUNG, 953,112.0 - SPLEEN, 204,62.0 - KIDNEY, 313,36.8 - BRAIN, 1355,29.8 - TESTIS, 28,4.28 - THYROID, 25,2.6 - PROSTATE, 17.1.38 - ORGAN WTS FOR 20- TO 30-YR-OLD 71-KG MALES. FOR 56-KG FEMALES, OVARY 10,2.53.

CIVIL DEFENSE + ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *CONCENTRATION + FOOD CHAIN + *DNA + PLANT + CELL + CELL, NUCLEUS + MODEL, BIOLOGICAL + MAMMAL, RAT + *MAN + MATURE + RNA + FEMALE + *FOOD INTAKE + MALE + *MASS + *ORGAN + THYMIDINE

064740
OLIVER R + LAJTHA LG
HAZARD OF TRITIUM AS A DNA LABEL IN MAN (T1858)
OXFORD HOSPITAL, ENGLAND
2 PAGES, NATURE, 186(4718), PP. 91-92 (1960)

MAN IS NOT A HELA CELL IN A CULTURE MEDIUM, BUT SINCE THE 1 MICRON AV-RANGE TRITIUM BETA IS ABSORBED WITHIN THE CELL (1/2 MAX DOSE-RATE IN 10 CUBIC MICRONS) A CELLULAR APPROACH IS SUGGESTED TO SOME. 0.03 UCI/GM WITHIN A 500 CUBIC MICRON NUCLEUS DELIVERS 0.06 RAD OR 0.1 REM IN 1 WEEK TO THAT NUCLEUS (CF NSIC NO. 64739), AND IF ADULT MAN HAS 10 (EXP +12) CELLS IN HIS BODY (NSIC NO. 64738) AND ALL OF THEM WERE DIVIDING, THEN PRESENT AUTHORS CLAIM THIS WOULD CONSTITUTE A BODY BURDEN OF 15 UCI AVERAGING OVER TOTAL NUCLEI, OR 0.6% OF THE ICRP2 (1959) VALUE. PAINTER, SCIENCE 127, 1244 (1958), INHIBITED 24-HR GROWTH OF HELA CELLS WITH 5,000 UCI/ML OF TRITIATED WATER AND 5 UCI/ML OF TRITIATED THYMIDINE. A 0.055-MEV PARTICLE DISSIPATES ITS ENERGY WITHIN A 1 MICRON SPHERE TO GIVE AN ABSORBED DOSE OF 168 RADS (286 REMS FOR AN RBE OF 1.7) OR 5 TIMES MORE ENERGY THAN WOULD BE DEPOSITED IN THE 1ST PART OF A C-14 BETA TRACK IN THE SAME VOL. CRONKITE, NSIC NO. 64741, PRODUCED IN-VIVO MITOTIC INHIBITION OF MOUSE SPERMATOGONIA AT 60 HR BY INJECTING 1 UCI/GM OF BODY WT OF H3-THYMIDINE OR BY GIVING 5 R OF EXTERNAL GAMMA IRRADIATION. A GOOD AUTORADIOGRAPHY REQUIRES 6 X 10 (EXP +4) ATOMS/NUCLEUS OF 500 U3 VOL, OR 6 UCI/GM OF NUCLEUS, OR 10 TIMES AS MUCH THYMIDINE IN NUCLEI AS IN WHOLE-BODY. 6 UCI/GM GIVES A DOSE OF 4 RADS (6.8 REMS) IN 60 HRS. BIOL HALF-LIFE OF DNA THYMIDINE IN-VIVO IS NOT KNOWN.

DOSIMETRY + HAZARD, RELATIVE + DOSE CALCULATION, INTERNAL + RADIATION MODEL + REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TOXICITY + CELL + *CELL, NUCLEUS + MODEL, BIOLOGICAL + ABSORBED FRACTION + LINEAR ENERGY TRANSFER + MAN + MITOSIS + RBE + DISTRIBUTION, MICRO + EFFECT, DOSE + THYMIDINE

064741
JOHNSON HA + CRONKITE EP
EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (T2297)
BROOKHAVEN NATIONAL LABORATORY, NEW YORK
7 PAGES, RADIATION RESEARCH, VOL. 11, PP. 825-831 (1959)

MIN DOSE LEVEL AT WHICH TRITIATED THYMIDINE (A) PRODUCES OBSERVABLE RADIATION INJURY TO MAMMALS HAS NOT BEEN DETERMINED, AND THEORETICAL PREDICTION IS NOT EASY. MOUSE SPERMATOGONIA (B) HAVE AN LD50 OF 20 TO 24 R OF EXTERNAL CO60 GAMMA AND ARE AFFECTED BY AS LITTLE AS 5 R ACCORDING TO OAKBERG, J EXPTL ZOOL 134, 343 (1957). FOR HISTOL EVAL OF RADIATION DAMAGE FROM (A) PRESENT AUTHORS USED METHOD OF OAKBERG WHICH INCLUDES FAILURE OF (B) TO PASS SUCCESSFULLY THROUGH 2 MITOSES AND TO DIFFERENTIATE INTO SPERMATOCYTES. THOUGH HIGHLY RADIOSENSITIVE, MOUSE TESTIS MIGHT BETTER BE USED AS A DOSIMETER FOR HOMOGENEOUS HIGH-ENERGY RADIATION SINCE H3 LABELING OF THE SEMINIFEROUS TUBULES IS NOT UNIFORM. AN IP DOSE OF 1 UCI/GM BODY WT OF (A) PRODUCES EFFECT ON (B) COMPARABLE TO THAT PRODUCED BY 5 R OF ACUTE WHOLE-BODY EXTERNAL GAMMA, 5 AND 10 UCI/GM DOSES COMPARABLE TO 10 AND 20 R OF GAMMA RESPECTIVELY. FRACTIONS OF CELLS SURVIVING 0,0.5,1,5,10,20 UCI/GM DOSES WERE RESPECTIVELY 1,0.97,0.92, 0.75,0.65,0.44, EACH REPRESENTING AN AVERAGE OF 80 TUBULES IN 4 MICE AT 60 HR, CORRESPONDING RATIOS OF SPERMATOCYTES/SERTOLI CELLS

064741 *CONTINUED*
BEING 4.67,4.52,4.34, 3.49,3.05,2.03. A SERIOUS LIMITATION OF EXPT IS THAT ALL MEMBERS OF THE CELL POPULATIONS STUDIED WERE NOT EQUALLY IRRADIATED.

*HAZARD, RELATIVE + DOSE CALCULATION, INTERNAL + DOSE CALCULATION, EXTERNAL + AUTORADIOGRAPHY + CORRELATION + *SPERM + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TOXICITY + MORPHOLOGY + DNA + CELL + CELL, NUCLEOLUS + MAMMAL, MOUSE + EXPOSURE, IP + MATURE + *MITOSIS + TESTIS + MALE + *EFFECT, DOSE + THYMIDINE

064742
RECOMMENDED DIETARY ALLOWANCES (T2562T2297A)
NATIONAL RESEARCH COUNCIL, FOOD AND NUTRITION BOARD
6 PAGES, PP. 16-20 OF RECOMMENDED DIETARY ALLOWANCES, SEVENTH REVISED EDITION, 1968

A DOSIMETRIC MODEL FOR DIETARY INTAKE OF TRITIUM IN THE FORM OF DNA, PROTEIN, OR OTHER ORGANIC FORM REQUIRES DIET AND EXCRETION DATA. THE BASAL KCAL REQUIREMENT FOR 70-KG REFERENCE MAN IS 1750, AND FOR IDEAL PROTEIN 20 MG/BASAL KCAL, SO TOTAL REQUIREMENT FOR IDEAL PROTEIN IS 36 GM/DAY, OR ALLOWING 30% FOR INDIV VARIABILITY IN A LARGE POPULATION IT IS 45.5 GM/DAY OF IDEAL PROTEIN. TAKING 70% UTILIZATION OF FOOD PROTEINS, THE RDA BECOMES 65 GM/DAY OR 0.9 GM/KG OF BODY WT/DAY FOR THE 70-KG REF MAN AS RECOMMENDED BY THE FOOD AND NUT BOARD. ASSUMING 2 GM OF DNA/100 GM OF FRESH WT ANIMAL PROTEIN SUCH AS CATTLE OR FOWL LIVER, AND TAKING 30 GM % AS WT OF THYMIDINE IN AN AVERAGE DNA MOLECULE, ADULT MAN SHOULD CONSUME 0.4 GM THYMIDINE/DAY, TO WHICH SHOULD BE ADDED THE CONTRIBUTION FROM RNA INTAKE, SEE ALSO NSIC NO. 64737. ZHARKOV, RADIOBIOLOGIYA 5, 67 (1965) (CF AEC-TR-6602) FOUND NORMAL URINARY THYMIDINE IN RAT URINE TO BE FROM 50 TO 100 UG IN SPRING/SUMMER AND 100 TO 200 IN AUTUMN/WINTER, AVERAGE OF 9 MATURE RATS. H3 EXCRETED IN OTHER FORMS SUCH AS AMINOISOBUTYRIC ACID (10 MG/DAY), AHSB(RP)R-71 (1966), 100 UGM PRODUCED FROM 100 RADS TO THE BODY STORE OF 25 GM OF THYMIDINE.

INGESTION + DIETARY HABIT + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *DNA + MODEL, BIOLOGICAL + EXCRETION, URINE + *OBSERVED RATIO + *PROTEIN + RNA + FOOD INTAKE + *THYMIDINE

064743
LONG C + KING EJ + SPERRY WM
CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (T1510)
6 PAGES, PP. 643, 676, AND 746 OF BIOCHEMISTS HANDBOOK, LONDON, E. AND F. N. SPON LTD., 1961

ASSUMING 10% P CONTENT FOR DNA AND RNA OF BRAIN, THE GMS OF DNA/KG AND THE GMS OF RNA/KG OF FRESH BRAIN WT CAN BE APPROXIMATED FROM DNA-P AND RNA-P LITERATURE VALUES AS FOLLOWS - MAN 0.4 TO 1.2, 0.6 TO 1.2 - DOG 0.5 TO 0.6, 0.5 TO 1.1 - GUINEA PIG 0.3 TO 1.1, 0.9 TO 2.5 - RAT 1.5, 15 TO 2.0 - CHICKEN 8, 1.65 - FISH 21, 2.65. FRESH BRAIN WTS IN % OF ADULT BODY WT IN SAME ORDER ARE 1.77 TO 3.02 - 0.59 - 0.92 TO 1.33 - 1.22 - 0.40 TO 0.44 - 0.6. THE DNA CONTENT OF LIVER CELLS FOR MAN, GUINEA PIG AND RAT IS ABOUT 10 MICROGRAMS PER 10 (EXP +6) CELLS, FOWL BEING 2.3. FOR ADULT MICE WEIGHING 25 GM, THE CONCN OF DNA IN A 33 MG THYMUS IS ABOUT 3 GM OF DNA/GM OF WET WT TISSUE. FOR RAT PANCREAS (P 737) DNA IS 4.3 GM/KG WET TISSUE AND RNA IS 13.8. FROM DNA CONTENT OF EACH ORGAN THE DOSE TO EACH ORGAN (OR TISSUE) FROM DNA-INCORPORATED 3-THYMIDINE CAN BE CALCD IF ADDNL DATA SUCH AS TURNOVER RATES ARE KNOWN. CF NSIC NOS. 64742, 64740, 64739, 64738, 64736, 64726, 58835, 56180, 49587, 49586. DNA IS NOT CONSTANT HOWEVER, E.G., 18 UG DNA/100 MG WET RAT LIVER IN DAYTIME BUT 73 AT NIGHT ACCORDING TO HORVATH, NATURE 200, 261 (1963).

CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + ANIMAL, FISH + PHYSIOLOGY/METABOLISM + *CONCENTRATION + FOOD CHAIN + *DNA + DIVERSITY, SPECIES + MAMMAL, SMALL + MAMMAL, DOG + MODEL, BIOLOGICAL + MAMMAL, RAT + LIVER + PANCREAS + *RNA + MASS + ORGAN + BRAIN + THYMIDINE + THYMUS + FOOD

064747
RUNINI JR + CRONKITE EP + FLIEDNER TM
METABOLISM AND FATE OF TRITIATED THYMIDINE IN MAN (T7585)
10 PAGES, 7 FIGURES, 1 TABLE, 25 REFERENCES, JOURNAL OF CLINICAL INVESTIGATION, VOL. 39, PP. 909-918 (1960)

AVAILABILITY TIME OF INJECTED THYMINE-6H3-DEOXYRIBOSIDE (A) IS SHORT, PLASMA H3 MAX WITHIN 1 MIN AND THEN DECLINING PRECIPITOUSLY, BONE MARROW H3 UPTAKE WITHIN 1 MIN, MOST INCORP IN 1ST 10-15 MIN, ESSENTIALLY COMPLETE IN 60 MIN, AFTER WHICH H3 PLASMA ACTIVITY DUE TO THYMIDILIC ACID, B-OH-AMINOISOBUTYRIC ACID (B) AND OTHER DEGRADATION PRODUCTS OF (A). AT LEAST 50% OF INJECTED (A) RETAINED IN-VIVO AND PRESUMABLY INTO NEW DNA OF PROLIFERATING CELLS, AT LEAST 25% OF (A) DEGRADED TO HTO, WITH (B) THE MAJOR COMPONENT OF URINE NONVOLATILE H3, EVEN IN THE 1ST URINE SAMPLES. BIOL HALF-LIFE OF THE HTO FORMED WAS FROM 7 TO 12 DAYS. IN CALCULATING MAX (A) DEGRADED TO HTO, THE URINE OR PLASMA WITH HIGHEST HTO WAS TAKEN TO BE REPRESENTATIVE OF TOTAL BODY WATER (TBW) AT THAT TIME, TBW TAKEN TO BE 52% IN NORMAL MAN. NON-VOLATILE H3 TAKEN AS DIFF BETWEEN TOTAL H3 AND HTO OF PLASMA. 90% OF INJECTED ACTIVITY LOST FROM BLOOD IN 1ST MIN. BOTH PATIENTS DIAGNOSED AS GLIOBLASTOMA MULTIFORME, A 44-YR-OLD MACHINIST, COMATOSE MAN DECEREBRATE AFTER CRANIOTOMY SURVIVING 6 MONTHS, AND A 65-YR-OLD SURVIVING 4 MONTHS, GIVEN SP ACT 0.2 TO 2 CI/MM, 1ST MAN 5 INJECTIONS OF 10 MCI EACH AND 1 OF 20, THE 2ND MAN SINGLE INJECTION OF 8 MCI (0.1-0.3 UCI/GM).

BIOMEDICAL + WATER + AUTORADIOGRAPHY + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + *PHYSIOLOGY/METABOLISM + BONE, MARROW + EXCRETION, URINE + EXPOSURE, IV + MAN + MATURE + MALE + TC PATHOLOGICAL + RETENTION FUNCTION + BLOOD, PLASMA + BODY FLUID + HOUR + THYMIDINE + WEEK

064748
RUBINI JR + KELLER S + WOOD L + CRONKITE EP
INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (T2243)

064748 *CONTINUED*
4 PAGES, PROCEEDINGS OF THE SOCIETY OF EXPERIMENTAL BIOLOGY AND MEDICINE, VOL. 106, PP. 49-52 (1961)

GOOD METABOLIC DATA BASED ON INGESTION ARE SCARCE. THIS PAPER SUPPLIES MINIMAL DATA, CONCNS GIVEN IN CPM/MG DRY WT INSTEAD OF UCI OR DPM, 2 GUINEA PIGS AT 2 HR, 2 RATS AT 3 AND 2 AT 6 FOR BODY-FLUID MEASUREMENT AND 1 MOUSE AT 8 HR FOR MARROW, TESTIS, ILEUM 5-WK AUTORADIOGRAPHY, USING 100 UCI BY INTUBATION. % H3-THYMIDINE (SP ACT 2 CI/MM) DEGRADED TO HTO IN RAT AND GP WAS 8 TO 17% AND THE % URINARY NONVOLATILE ACTIVITY WAS 0.23 TO 0.41%, THE NONVOLATILE ORGAN DISTRIB BEING (IN CPM/MG DRY WT) SPLEEN 44, LIVER 28, MARROW 28, KIDNEY 15, ILIUM 11, ILIOPSOAS 5 AND 442 IN STOMACH CONTENTS. HEAVIEST AUTORADIOGRAPHIC LABELING SEEN IN MUCOSA OF SMALL INTESTINE. FOR ADDNL DATA ON INCORPORATION OF H3 FROM THYMIDINE INTO DNA SEE NSIC NOS. 64746, 64745, 64743. OF THAT INGESTED H-3-THYMIDINE (OR THYMINE) WHICH REACHES THE BLOOD, PRESUMABLY NOT MORE THAN 10% GETS INCORPORATED INTO MOUSE DNA, NSIC NO. 64738. 2% OF INGESTED THYMIDINE MAY CROSS RAT GUT WALL INTO BLOODSTREAM, NSIC NO. 49587, AT LEAST 50% OF WHICH MAY BE RETAINED BY THE BODY, NSIC NO. 64747, OF WHICH A MJAOR PART CONCENTRATES IN THE NUCLEUS OF DNA-SYNTHESIZING OR DNA-REPAIRING CELLS, NSIC NOS. 64744, 64726.

*INGESTION + AUTORADIOGRAPHY + CRITICAL MASS + ABSORPTION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + CONCENTRATION + MAMMAL, SMALL + BONE, MARROW + MODEL, BIOLOGICAL + MAMMAL, MOUSE + MAMMAL, RAT + GI TRACT + KIDNEY + LIVER + MATURE + MUSCLE + INTESTINE, SMALL + SPLEEN + STOMACH + MALE + BODY FLUID + HOUR + THYMIDINE

064749
GUILD WR
HAZARDS FROM ISOTOPIC TRACERS (T2297)
1 PAGE, SCIENCE, VOL 128, P. 1308 (1958)

DATA ARE ABSENT OR SCARCE FOR SPECIALIZED METABOLITES ACCIDENTLY OR DELIBERATELY INTRODUCED INTO THE BODY, REQUIRING CAUTION THEREFORE. FOR EXAMPLE, TRITIATED THYMIDINE HAS BEEN A GROWING FAVORITE AMONG BIOMEDICAL WORKERS. THE HUMAN BODY CONTAINS 50 TO 100 GM OF DNA (CF NSIC NO. 64744) OR 1000 TIMES LESS DNA THAN IT DOES H2O. WHERE THE BIOL HALF-LIFE OF HTO IS ONLY 19 DAYS OR SO, THAT FOR DNA MAY BE BETWEEN 6 MONTHS AND SEVERAL YRS. 10 MCI OF HTO IN THE BODY, OR 200 UCI/L OF DRINKING WATER, UNIFORMLY DISTRIBUTED THROUGHOUT THE 50 LITERS OF STANDARD MAN (NBS HANDBOOK NO. 52 (1953)) WOULD DELIVER 300 MREM/WK. THE INTEGRAL DOSE FROM A SINGLE INTAKE OF 1 CURIE WOULD DELIVER A TOTAL DOSE OF 100 REM, ON WHICH BASIS USAEC ALLOWS SALE OF 250 UCI OF TRITIUM WITHOUT SPECIFIC LICENSE, ALL OF WHICH DRUNK IN FORM OF WATER WOULD DELIVER 20 TO 35 MREM, A REASONABLE RISK FOR BIOMEDICAL INVESTIGATORS. BUT ONE IS ALLOWED ALSO TO BUY 250 UCI OF TRITIATED THYMIDINE WITHOUT SPECIFIC LICENSE. IF ALL THE RADIATION FROM 250 UCI OF TRITIATED THYMIDINE COULD BE IN THE DNA, GENE MATERIAL COULD RECEIVE A DOSE 10,000 TO 100,000 GREATER THAN THAT FROM AN EQUAL QUANTITY OF TRITIATED WATER. ONLY A SMALL FRACTION OF CELLS ARE ACTIVELY SYNTHESIZING DNA, AND IF THEY PICKED UP MOST OF THE TRITIUM, DOSE COULD BE FURTHER INCREASED. CF NSIC NO. 64752.

BIOMEDICAL + CODES AND STANDARDS + OXIDE + HAZARD, RELATIVE + WATER + DOSE CALCULATION, INTERNAL + ICRP + PERSONNEL EXPOSURE, RADIATION + CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + *DNA + MAN + AGENCY, AEC + DISTRIBUTION, MICRO + THYMIDINE

064753
JOHNSON HA
DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)
BROOKHAVEN NATIONAL LABORATORY, NEW YORK
9 PAGES, 18 REFERENCES, PP. 315-323 OF THE PROCEEDINGS OF THE SYMPOSIUM ON MEDICAL RADIONUCLIDES - RADIATION DOSE AND EFFECTS, OAK RIDGE, TENNESSEE, DECEMBER 8-11, 1969

10% OF INJECTED H3-THYMIDINE (A) CONCENTRATES IN NUCLEI OF THOSE FEW CELLS SYNTHESIZING DNA AT TIME OF INJECTION, WHICH WOULD IMPLY VERY LARGE DOSE RATES TO GENETIC MATERIAL. FOR MOST OF THE CELL CYCLE, 5 PG OF DNA IS EVENLY DISPERSED OVER 250 PG OF NUCLEOPLASM SO THAT MOST OF THE ENERGY IS ABSORBED BY OTHER THAN DNA AND SOME IS ABSORBED BY CYTOPLASM. 70% OF BODY WATER IS INTRACELLULAR, OF WHICH 10% IS INTRANUCLEAR, SO DOSE RATE TO GENETIC MATERIAL FROM (A) IS PROBABLY NOT MORE THAN 15 TIMES GREATER THAN FROM EQUAL ACTIVITY OF HTO (CF NSIC NOS. 64735, 64749). BOND, NSIC NO. 49714, CALCD ABSORBED DOSE FOR RAT MARROW CELL NUCLEI FROM 1 UCI OF INJECTED (A) PER GM OF BODY WT, AVERAGE ACTIVITY PER NUCLEUS 1.2 DIS/HR AT 1 HR POSTINJECTION, AVERAGE BETA ENERGY 5.7 KEV, AVERAGE NUCLEAR DIAMETER 8 U OR A MASS OF 270 PG, MAX RANGE OF THE BETA IN WATER 6 U, ABOUT 20% OF TOTAL ENERGY ESCAPING FROM NUCLEUS BECAUSE OF SO-CALLED EDGE EFFECT, TO GIVE AN AVERAGE DOSE OF 8 RADS/DAY. PARADOXICALLY, MOST HEAVILY IRRADIATED CELLS ARE THOSE INCORPORATING LEAST (A) BECAUSE THEY HAVE LOWEST TURNOVER AND THEREFORE HIGHEST ACCUMULATED DOSE, 99% OF LABELED DNA BEING LOST IN 2 MONTHS FROM ACTIVE CELLS.

*OXIDE + *HAZARD, RELATIVE + *DOSE CALCULATION, INTERNAL + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + TOXICITY + DNA + CELL + *CELL, NUCLEUS + MODEL, BIOLOGICAL + MAMMAL, RAT + EXPOSURE, IV + PATHOLOGY + DISTRIBUTION, MICRO + *THYMIDINE

064759
CRONKITE EP + FLIEDNER TM + KILLMANN SA + RUBINI JR
TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (T2297)
BROOKHAVEN NATIONAL LABORATORY, UPTON, LONG ISLAND, NEW YORK
20 PAGES, 44 REFERENCES, 7 FIGURES, 4 TABLES, TRITIUM IN PHYSICAL AND BIOL SCIENCES, 2, PAGE 189-209, 1961, (T2297)

WITH REGARD TO DOSIMETRY, METABOLISM, AND TOXICITY OF H3-THYMIDINE (A) THIS REVIEW LEAVES

064759 *CONTINUED*
SOMETHING TO BE DESIRED, A REFLECTION OF THE STATE OF THE ART. INTERPRETATION OF SERIAL AUTORADIOGRAPHIC DATA FOLLOWING FLASH LABELING BY (A) USUALLY ASSUMES (1) H3 LABEL ON (A) DOES NOT EXCHANGE, (2) THYMINE BASE DOES NOT EXCHANGE AFTER INCORP INTO DNA, (3) DNA TURNOVER IS SOLELY RESULT OF MITOSIS AND CELL DEATH, (4) REUTILIZ OF (1) FROM DNA DEGRADATION IS INSIG, (5) REUTILIZ OF LARGE CHUNKS OF DNA IS UNLIKELY IN MOST CELL RENEWAL SYSTEMS, (6) DNA SYNTHESIS IN NORMAL CELLS DESTINES A CELL TO DIVIDE ONCE AGAIN, (7) INITIALLY (A) IS UNIFORMLY DISTRIBUTED THROUGHOUT THE BODY AND IS EITHER PROMPTLY INCORPD INTO DNA OR DEGRADED TO NONLABELING MATERIALS, (8) EFFECTIVE AVAILABILITY TIME OF (A) FOR DNA SYNTHESIS IS SHORT, (9) RADIATION FROM (A) IN DNA DOES NOT PERTURB NORMAL STEADY STATE CELL PROLIF, (10) IN-VITRO LABELING DETERMINES PROLIF POTENTIAL OF NORMAL CELLS, (11) IN-VIVO LABELING AFTER SINGLE I.V. MAKES KINETICS OF PROLIF STUDY POSSIBLE BY DILUTING DNA RADIOACTIVITY THROUGH SUCCESSIVE MITOSES, ETC. TOXICITY PAPERS REVIEWED, AS WELL AS CYTOLOGY, HEMATOLOGY, HISTOPATHOLOGY. CF NSIC NOS. 64758, 64757, 64746 FOR TOXICITY AND 64758, 64753, 64749, 64746, 64740, 64739, 64730, 49714, 49587, 49586 FOR DOSIMETRY.

IAEA + DOSE CALCULATION, INTERNAL + POPULATION EXPOSURE + AUTORADIOGRAPHY + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + CHROMOSOMAL EFFECT + PHYSIOLOGY/METABOLISM + TOXICITY + BLOOD + BONE, MARROW + CELL + MODEL, BIOLOGICAL + MAMMAL, MOUSE + MITOSIS + THYMIDINE

064766
SMITH TE + TAYLOR RT
INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE, BIO-MEDICAL DIVISION
UCRL-50781 +. 24 PAGES, 72 REFERENCES, 4 FIGURES, 1969

QUOTE - BY MAKING ASSUMPTIONS THAT TRITIUM REMAINS ENTIRELY IN BODY WATER UNTIL IT IS ELIMINATED AND THAT ITS REMOVAL FOLLOWS A SINGLE EXPONENTIAL CURVE, THE BIOLOGICAL HALF-LIFE OF TRITIUM IN MAN HAS BEEN ESTIMATED TO BE 8.5 TO 10.5 DAYS (NSIC NOS. 64767, 64768). HOWEVER, THE FALLACY IN THESE ASSUMPTIONS HAS BEEN DEMONSTRATED SEVERAL YEARS EARLIER WITH THE OBSERVATION THAT TRITIUM CONCENTRATIONS IN THE FAT ORGANIC CONSTITUENTS WERE HIGHER THAN THE BODY WATER IN THE CASE OF A MAN WHO, PRIOR TO HIS DEATH, HAD BEEN EXPOSED TO HTO FOR A PERIOD OF 8 MONTHS (NSIC NO. 64728). RECENTLY, JUNGAS CLEARLY DEMONSTRATED IN-VITRO WITH RAT ADIPOSE TISSUE THAT INCORP OF TRITIUM WAS AN EXCELLENT INDEX OF UNSATD FATTY ACID BIOSYNTHESIS (NSIC NO. 64769). UNQUOTE. CF NSIC NO. 64770. THIS BIOCHEMICAL REVIEW DIVIDED INTO 3 PARTS - (1) INTRODUCTION, (2) CONTRIBUTIONS OF GLUCOSE METABOLISM TO TRITIUM RETENTION IN MAMMALIAN SYSTEMS, (3) ONE-CARBON METABOLISM - SPEAKING IN A QUALITATIVE WAY TO THE QUESTION - WHAT IS THE METABOLIC FATE OF TRITIUM IF INGESTED AS HTO AT A CONSTANT LEVEL OVER A PROLONGED TIME-SUGGESTING THAT THE STORAGE COMPARTMENTS FOR TRITIUM ARE CHEMICAL RATHER THAN STRUCTURAL IN NATURE, CITING THOMPSON, JBC 200, 731 (1953), AND SPELLING OUT SOME OF THE CHEMICAL PATHWAYS INVOLVED.

INGESTION + OXIDE + WATER + HAZARDS ANALYSIS + REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOCHEMICAL + *BIOLOGICAL HALF-LIFE + *PHYSIOLOGY/METABOLISM + DNA + MODEL, BIOLOGICAL + MAMMAL, RAT + *EXPOSURE, CHRONIC + *FAT + MAN + PROTEIN + WHOLE BODY + *ORGANIC + BODY FLUID

064767
BUTLER HL + LEROY JH
OBSERVATION OF BIOLOGICAL HALF-LIFE OF TRITIUM (T3681)
SAVANNAH RIVER PLANT, E.I. DU PONT DE NEMOURS AND COMPANY, AIKEN, SOUTH CAROLINA
3 PAGES, 10 REFERENCES, 3 FIGURES, 2 TABLES, HEALTH PHYSICS, 11, PAGE 283-5, 1965, (T3681)

CF NSIC NO. 64766. 309,000 URINE SAMPLES RADIOASSAYED OVER PRECEEDING 10 YR FOR H3, URINE EXCEEDING 20 UCI/L IN 310 CASES, BIOL HALF-LIFE (TB) VARYING FROM 4 TO 18 DAYS FOR THESE LATTER CASES, AVERAGING 9.5 +- 4.1 DAYS, 90% CONF LEVEL. AVERAGE TB FOR 37 CASES RANGED FROM ABOUT 11 DAYS IN MAR DROPPING TO A MIN OF 7 IN JUL, RISING AGAIN TO 11 DAYS MAX IN NOV WITH SMALLER MIN OF 9.5 DAYS IN FEB. SHORTEST TB OF 7 DAYS CORRELATED WITH MAX TEMP OF 80 DEG F IN JUL, MIN SAVANNAH TEMP OF ABOUT 40 DEG F IN DEC-JAN. 4 POINTS, AVERAGES OF 57, 169, 69 AND 15 CASES RESPECTIVELY, FROM 20-29, 30-39, 40-49 AND 50-59 AGE BRACKETS RESPECTIVELY FELL LINEARLY WITH AGE FROM ABOUT 10.5 DAYS TO 9.5 TO 9.0 TO 8.2 DAYS RESPECTIVELY. CONTRARY TO NSIC NO. 64766, PRESENT AUTHORS MAINTAIN THAT DATA COLLECTED BY THOMPSON, HW-20092 (1951), AND BY LANGHAM, NSIC NO. 64727, INDICATE INCORP OF H3 INTO THE BODY ORGANIC CONSTITUENTS IS RELATIVELY INSIGNIFICANT. PRESENT AUTHORS DID NOT SEE A DELAYED RELEASE OF ORGANICALLY BOUND TRITIUM IN ANY OF THEIR CASES. IN 7 INDIVIDUALS WHO HAD 3 OR MORE UPTAKES OF H3 THERE WAS NO CONSISTENCY IN THE RATE OF ELIMINATION BY A GIVEN INDIVIDUAL.

OXIDE + SAVANNAH RIVER PLANT + PERSONNEL EXPOSURE, RADIATION + ENVIRONMENT + REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + *TEMPERATURE + *EFFECT, AGE + *EXCRETION, URINE + MAN + MATURE + WHOLE BODY + VARIABILITY

064768
REINING WC + ALBENESIUS EL
CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT
E.I. DU PONT DE NEMOURS & COMPANY, + SAVANNAH RIVER PLANT, AIKEN, SOUTH CARCLINA
7 PAGES, 13 REFERENCES, 3 TABLES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 24, PAGE 276-283, 1963, (T1782)

CF NSIC NO. 64766. TRITIUM IS PRODUCED AS AN UNWANTED BYPRODUCT FROM NEUTRON IRRAD OF C2O IN THE REACTORS, AND FROM LI IRRADIATION. NOMOGRAM OF MINUTES TO ASSIMILATE 1 MCI OF HTO VS AIR ACTIVITY IN UCI OF HTO/CC GIVEN FOR DIFFERENT TYPES OF MASK AND SUIT PROTECTION. STACK MONITORS GIVE CONTINUOUS RECORD OF H3 CONCNS. TRITIUM EXPOSURE RECORD AT SAVANNAH AS FOLLOWS - YEAR, NO. OF ASSAYS, H3 UPTAKE BETWEEN 0.37 AND 1.0 MCI, H3 UPTAKE GREATER THAN 1.0 MCI - 1954, 2190, -, 0 - 1955, 2310, -, 2 - 1956, 2230, -, 13 - 1957, 4000, -, 49 - 1958, 3600, 307, 33 - 1959, 2590,

064768 *CONTINUED*
156, 22 - 1960, 2720, 452, 79 - 1961, 2690, 401, 73. AT URINARY H3 CONCNS GREATER THAN 20 UCI/L IN 75 CASES THE BIOL HALF-LIFE AVERAGED 10 DAYS. MAX AVERAGE WEEKLY CONCN OF H3 IN MILK FROM 3 LOCAL DAIRIES AND 2 FARMS WAS 7 X 10 (EXP -6) UCI/CC. MAX AVERAGE WEEKLY CONCN IN DRINKING WATER WAS 13% OF LIMIT SUGGESTED BY ICRP FOR LARGE POPULATIONS. AVERAGE AIR CONCN WAS 0.5 UCI/CC X 10 (EXP -9), WITH WEEKLY MAX OF 6.8, AND RAINWATER AVERAGED 16 X 10 (EXP -6) WITH WEEKLY MAX OF 180. CF NSIC NOS. 49702, 49713, 56158 FOR ADDNL SAVANNAH RIVER DATA ON TRITIUM.

MPBB + OXIDE + WATER + AIR + MILK + MONITOR, ENVIRONMENTAL + SAVANNAH RIVER PLANT + POPULATION EXPOSURE + *PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *EXCRETION, URINE + MAN + MATURE + EXPOSURE, BACKGROUND

064769
JUNGAS RL
FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)
9 PAGES, 53 REFERENCES, 3 TABLES, 4 FIGURES, BIOCHEMISTRY, 7, PAGE 3708-3717, 1968 (T7599)

CF NSIC NO. 64766. THOUGH IN-VITRO TISSUE SLICE METABOLISM IS FAR REMOVED FROM INTACT-BODY METABOLISM, STOICHIOMETRICALLY AND OTHERWISE, SUCH BIOCHEMICAL INFORMATION SHOULD BE CONSIDERED IF IT LEADS TO NEW INSIGHT ON TRITIUM HAZARD TO MAN FROM CHRONIC INTAKE. IN-VIVO AND IN-VITRO STUDIES HAVE INDICATED THAT DEUTERATED AND TRITIATED WATER LABELS SHOW UP IN FATTY ACIDS (A) OF VARIOUS TISSUES IN SUBSTANTIAL AMTS. PURPOSE OF PRESENT STUDY TO PERMIT MORE DETAILED PREDICTIONS ON NATURE, MECHANISM AND EXTENT OF LABELING OF (A) AND OF ISOTOPIC MASS EFFECT ON KINETICS, USING HTO, 1 TO 5 MCI, OR UNIFORMLY-LABELED C14-GLUCOSE, 0.7 UCI, WITH ABOUT 150 MG OF TISSUE EACH TIME. H3 INCORP INTO (A) AVERAGED 0.0013 UG-ATOM/100 MG OF FRESH TISSUE IN 2 HR IN THE ABSENCE OF (A) SYN.HESIS, OR 4 ORDERS OF MAGNITUDE LESS THAN IN PRESENCE OF SYNTHESIS. FOR EACH C14 ATOM INCORPD INTO (A), 7/8 OF AN H3 ATOM IS ALSO INCORPD, OR AN AVERAGE OF 14 H3 ATOMS PER (A) MOLECULE, AVERAGE CHAIN LENGTH OF NEWLY SYNTHESIZED (A) BEING 16.0. 1 H3 ATOM ASSOCD WITH EVEN-NUMBERED C ATOMS, 2/3 WITH ODD, ALPHA CARBON 1.00, BETA 0.74, GAMMA 0.96, DELTA 0.70 ATOMS OF H3 PER ATOM OF C14. NO REACTIONS KNOWN WHICH EXCHANGE THE HYDROGENS AT POSITIONS 1 AND 6 OF GLUCOSE. CF NSIC NO. 64763.

CARBON + DEUTERIUM + HYDROGEN + OXIDE + ANALYTICAL TECHNIQUE + ISOTOPIC FRACTIONATION + *RADIONUCLIDE UPTAKE + ANIMAL- VERTEBRATE + *BIOCHEMICAL + PHYSIOLOGY/METABOLISM + MAMMAL, RAT + *FAT + OBSERVED RATIO + ORGANIC + *IN VITRO + EFFECT, MASS

064772
DEWEY WC + HUMPHEREY RM + JONES BA
COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (T7605)
DEPARTMENT OF PHYSICS, THE UNIVERSITY OF TEXAS, M.D. ANDERSON HOSPITAL AND TUMOR INSTITUTE, TEXAS MEDICAL CENTER, HUSTON, TEXAS
24 PAGES, 68 REFERENCES, 1 TABLE, 6 FIGURES, RADIATION RESEARCH, 24, PAGE 214-238, 1975

SINCE MACRODOSIMETRY OF TRITIATED WATER (A) IS BETTER DOCUMENTED THAN THAT FOR TRITIATED THYMIDINE (B), INTERCOMPARISON IS IMPORTANT TO MAKE BETTER USE OF THE EXTENSIVE LITERATURE ON (B) AS AN ORGANIC PROTOTYPE IN ASSESSING PAST, PRESENT, AND FUTURE HAZARDS OF TRITIUM IN MAN AND HIS FOOD CHAIN. 2 X 10 (EXP +6) CHINESE HAMSTER CELLS/FLASK IN MCCOY 5A MEDIUM + 10% CALF SERUM, INCUBATED 24 HR AT 37 C IN 6% CO2 AND THEN PULSE-LABELED FOR 1 HR WITH FROM 0.03 TO 20 UCI/ML OF (B), SP ACT 1.9 OR 5.5 CI/MM, WASHED WITH UNLABELED (B), THEN INCUBATED 10 HR AND 50 LABELED METAPHASES/SAMPLE THEN ANALYZED FOR NO. OF GRAINS AND NO. OF CHROMOSOMAL BREAKS AND EXCHANGES, EACH EXCHANGE (CHROMATID OR DICENTRIC) COUNTED AS 2 ABERRATIONS. LABELED CELLS OF ALL SAMPLES HAD 25 TO 100 GRAINS/CELL. TO PRODUCE 2 ABERRATIONS/CELL REQUIRED 820 RADS TO NUCLEUS FOR (B), 490 FOR (A) AND 520 FOR CO-60 GAMMA AT A DOSE RATE OF 0.25 TO 1.4 RAD/MIN FOR 9 HR FOR TOTAL GAMMA DOSE FROM 150 TO 900 RADS. TO PRODUCE 2 ABERRATIONS/CELL REQUIRED 1780 AND 3500 DISINT/NUCLEUS FOR (A) AND (B) RESPECTIVELY OR 490 AND 1050 RADS/NUCLEUS. ABERRATION FREQUENCY FOR (A) AND CO-60 GAMMA VARIED AS 1.8 TO 1.9 POWER OF DOSE, WHILE (B) WAS CLOSER TO 1.0. ON BASIS OF ENERGY ABSORBED/NUCLEUS, (A) WAS MORE EFFECTIVE THAN (B) IN PRODUCING ABERRATIONS, BUT NOT ON BASIS OF TOTAL ENERGY ABSORPTION/CELL. CF NSIC NOS. 64740, 49713, 49586, 62623, 58835, 64753.

*OXIDE + HAZARD, RELATIVE + *DOSE CALCULATION, INTERNAL + *CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *CHROMOSOMAL EFFECT + PHYSIOLOGY/METABOLISM + TOXICITY + DNA + MAMMAL, SMALL + CELL, NUCLEUS + ORGANIC + IN VITRO + *EFFECT, DOSE + *THYMIDINE

064773
RICHMOND CR + FURCHNER JE + LANGHAM WH
EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND TRITIUM (T1643)
LOS ALAMOS SCIENTIFIC LABORATORY, UNIVERSITY OF CALIFORNIA, LOS ALAMOS, NEW MEXICO
LAMS-2526 +. 9 PAGES, 4 REFERENCES, 2 TABLES, 2 FIGURES, PAGE 25-33, APRIL 1961

MPC OF A RADIONUCLIDE IS THAT AMT/CC OF AIR OR WATER TAKEN INTO BODY CONTINUOUSLY WITHOUT EXCEEDING RECOMMENDED ACTIVITY (Q) IN A SPECIFIC TISSUE, WHEN EQUIL CONDITIONS REACHED. INTEGRATION OF EFFECTIVE RETENTION FUNCTION, R(T), FROM T ZERO TO INFINITY GIVES TOTAL AREA UNDER CURVE WHICH IS AN ESTIMATE OF EQUIL LEVEL. (MPC)W IS Q/AI, WHERE Q IS MAX PERMISSIBLE BODY BURDEN, A EQUIL LEVEL OR AREA UNDER RETENTION FUNCTION, I DAILY WATER INTAKE. THIS REPORT SHOWS HOW A CAN BE ESTIMATED FROM INTERSPECIES CORRELATION. AREAS UNDER R(T) CURVES FOR MOUSE, RAT, DOG, MAN FOR ZN65 SHOWN TO POWER FUNCTION OF SPECIES WT, LAMS-2445 (1960) P 80. SIMILARLY FOR HTO, LAMS-2445 (1960) P 94. EQUIL LEVEL OF HTO VS BODY WT IN GM FOR MOUSE, RAT, RABBIT, DOG, MAN, HORSE FITTED BY FUNCTION A EQUAL TO 1.09 W (EXP +0.2099). (MPC)W FOR HTO IN UCI/ML BY ICRP

064773 *CONTINUED*
(1959) 5 X 10 (EXP -2), BY HUMAN DATA 7 X 10 (EXP -2), FROM INTERSPECIES EXTRAPOLATION 6 X 10 (EXP -2), BY INTERSPECIES INTERPOLATION 8 X 10 (EXP -2), CONTINUOUS EXPOSURE, ORGANIC TRITIUM IGNORED. (MPC)W ZN-65 BY ICRP (1959) 10 (EXP -3), BY HUMAN DATA 2.4 X 10 (EXP -4) AND BY INTERSPECIES EXTRAPOLATION 2.4 X 10 (EXP -4). CF NSIC NOS. 49684, 49711, 62587, 64727, 64730, 64733, 64766, 56158.

MPBB + *MPC + OXIDE + ZINC + ICRP + *CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + MAMMAL, SMALL + MAMMAL, DOG + MODEL, BIOLOGICAL + MAMMAL, MOUSE + MAMMAL, RAT + MAMMAL, LARGE + MAN + *POWER FUNCTION + *WHOLE BODY + *MASS + RETENTION FUNCTION

064774
BUTLER GG
REPORT OF COMM 4 ON EVAL OF RADIATION DOSES TO BODY TISSUES FROM INTERNAL CONTAMINATION DUE TO OCCUPATIONAL EXPOSURE (T1000)
ICRL PUB 10 +. 2 PAGES, 5 REFERENCES, 1968

CONCERNED WITH URINARY MONITORING OF WORKERS FOR ACCIDENTAL SINGLE INTAKE. CITED ARE NSIC NOS. 64727, 64767, 49702 + PERSONAL COMMUNICATION FROM RV OSBORNE (CF NSIC NO. 56159). ASSUMING 43 KG OF BODY WATER IN STANDARD MAN TO BE THE CRITICAL ORGAN, DOSE FROM 1 UCI INTAKE OF HTO SHOULD BE 0.167 MREM, CORRESPONDING TO AN INITIAL CONCN OF 35 UCI/L OF BODY FLUID OR OF URINE. INVESTIGATION LEVEL IS 1.5 MCI (0.25 REM) OF TRANSPORTABLE H3 IN WHOLE BODY, NON-TRANSPORTABLE H3 NOT CALCD, OR A URINARY CONCN OF 35 E (EXP -0.07T) UCI/L, OR 13, 4, 0.5 UCI/L AT 14, 30, 60 DAYS RESPECTIVELY. A SENSITIVITY OF 10 DAYS SUGGESTED AS A REASONABLE AVERAGE BIOL HALF-LIFE FOR MAN BASED ON A MEAN OF 11.5 DAYS FOR 8 SUBJECTS (NSIC NO. 64727), 9.5 +-4.1 DAYS FOR 310 SUBJECTS (NSIC NO. 49702), 6.5 +-12.5 DAYS FOR 12 SUBJECTS (RV OSBORNE). FRACTIONAL EXCRETION EQUATION OF 0.07 E (EXP -0.0693T) PER DAY IS SUGGESTED, WITH TRANSPORTABLE DOSE TO WHOLE BODY AS THE INTERGAL FROM 0 TO 50 YR OF E (EXP -0.0693) DT, WHICH IS ABOUT 14 UCI-DAYS.

CODES AND STANDARDS + MPBB + OXIDE + WATER + *DOSE CALCULATION, INTERNAL + HAZARDS ANALYSIS + *ICRP + *PERSONNEL EXPOSURE, RADIATION + REVIEW + MATHEMATICAL TREATMENT + *CRITICAL MASS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + MODEL, BIOLOGICAL + *EXCRETION, URINE + MAN + MATURE + *BODY FLUID

064775
BUTLER GC
ASSESSMENT OF INTERNAL CONTAMINATION RESULTING FROM RECURRENT OR PROLONGED UPTAKES (T1000)
ICRP PUB 10A +. 4 PAGES, 1 REFERENCE, 2 TABLES, 2 FIGURES, 1969 (T1000)

ICRP PUB 2 (1959) RECOMMENDED MAX PERMISSIBLE CONCNS IN AIR AND WATER FOR CHRONIC (50-YR) OCCUPATIONAL EXPOSURE. ACUTE EXPOSURE IS MORE COMMON FOR OCCUPATIONAL WORKERS WHILE CHRONIC IS MORE LIKELY FOR GENERAL POPULATION. ICRP PUB 10 (1968) (CF NSIC NO. 64774) WAS BASED ON A SINGLE EXPOSURE MODEL, WHILE PRESENT EXTENTION COVERS REGION BETWEEN SINGLE AND LONG-TERM EXPOSURE, GIVING EXCRETION AT VARIOUS TIMES AFTER INTAKE, DERIVING INVESTIGATION LEVELS AND CALCULATING RADIATION DOSE TO THE CRITICAL ORGAN, STARTING FROM THE CONVOLUTION INTEGRAL OF AN UPTAKE OR DEPOSITION FUNCTION AND A RETENTION FUNCTION. FINAL BODY (OR ORGAN) CONTENT FROM TOTAL UPTAKE (OR DEPOSITION) OF 1 UCI OF TRITIUM DISTRIBUTED OVER T DAYS AS FOLLOWS - T IN DAYS, HTO IN MICROCURIES AT TIME T - 2,0.93 - 5,0.84 - 12,0.68 - 30,0.42 - 90, 0.16 - 180, 0.08 - 360,0.04 - 1000,0.01 - 18000,0.0007. DERIVED INVEST LEVELS FOR EXCRETION FOLLOWING CONSTANT UPTAKE AS FOLLOWS - SAMPLING PERIOD IN DAYS, FINAL BODY CONTENT IN UCI - 7,1190 - 14,960 - 30,630 - 90,240 - 180,120 - 360,60. IDEALIZED CURVES SHOWN FROM 1 TO 100 DAYS FOR SINGLE UPTAKE OF 1 UCI ON DAY 0, ON DAY T/2, ON DAY T-1, AND FOR 1 UCI EVENLY DISTRIBUTED OVER T DAYS, NAMELY, 1/T UCI/DAY. BIOL HALF-LIFE FOR H3 TAKEN AS 10 DAYS WITH 1-EXPONENTIAL.

CODES AND STANDARDS + MPBB + OXIDE + DOSE CALCULATION, INTERNAL + *ICRP + RADIONUCLIDE UPTAKE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + EXCRETION, URINE + EXPONENTIAL FUNCTION + WHOLE BODY + BODY BURDEN + RETENTION FUNCTION + MONTH

064776
BARRY PJ
MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (T1643)
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-1624 +. 29 PAGES, OCTOBER 1962

GUIDE FOR REACTOR DESIGNERS, BY ACAPTING ICRP 2 (1959) (MPC)A VALUES TO INFANTS AND CHILDREN AND THE FOOD CHAIN, ASSUMING WHOLE BODY WTS OF 3.7, 8.8, 10 AND 70 KG AT BIRTH, 6 MONTHS, 1 YR, AND FOR ADULTS RESPECTIVELY, MAX PERMISSIBLE DOSE RATES ASSUMED INDEPENDENT OF AGE AND TAKEN AS 10 REMS WHOLE-BODY EXPOSURE FROM MEDICAL RES COUNCIL. VENTILATION RATE 100, 250, 330, 830 LITERS/HR AT BIRTH, 6 MO, 1 YR AND ACULTS RESP, WITH DAILY MILK INTAKE IN CANADA OF 900 ML AT 6 MO. EFF ABSORBED ENERGY FROM ICRP 2 (1959) WITHOUT ALLOWANCE FOR CHANGES IN SIZE OF CRITICAL ORGAN WITH AGE. EFFECTIVE HALF-LIFE AND FRACTIONS REACHING CRITICAL ORGAN ALSO FROM ICRP 2 (1959). COW MILK CONSUMPTION IN CANADA MAX AT 6 MONTHS OF AGE, BUT NOT IN USA. (CF NSIC NOS. 62651, 64699.) MAX PERM SP ACT OF H3 AS OXIDE IN WATER FROM MAX PERM BODY BURDEN AND H2O CONTENT OF STAND MAN IS 2.33 X 10 (EXP -3) UCI H3/GM WATER. MEAN WATER VAPOR CONCN IN AIR OF 8 GM/M3 BETWEEN APR-OCT CORRESPONDS TO MPC OF 2 X 10 (EXP -8) CI/M3 FOR H3 IN AIR OVER AGRICULTURAL LAND. MAX PERM EXPOSURE (MPE) TO HTO VAPOR IN RESPIRABLE AIR AFTER AN ACCIDENT IN CI-SEC/M3 IS 0.1 MASS OF ORGAN/VENTILATION RATE. BODY WATER OF INFANT TAKEN AS 750 GM/KG BODY WT. AT BIRTH, 6 MO, 1 YR, ADULT, RESPECTIVE MPE VALUES ARE 95, 90, 76, 215. RURAL CHILDREN MOST LIKELY TO INGEST MILK OF PURELY LOCAL ORIGIN. PRESENT POLICY IS RURAL SITING OF REACTORS.

AIRBORNE RELEASE + CANADA + CODES AND STANDARDS + MPBB + MPC + OXIDE + *SITING, REACTOR + *MILK + DOSE

064776 *CONTINUED*
CALCULATION, INTERNAL + *POPULATION EXPOSURE + ICRP + RADIATION, PUBLIC EDUCATION + *ACCIDENT, DESIGN BASIS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + RESPIRATION + PHYSIOLOGY/METABOLISM + FOOD CHAIN + MAN + MATURE + YOUNG + *INFANT

064777
THOMPSON RC
REVIEW OF LABORATORY ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF TRITIUM (T7609)
BATTELLE MEMORIAL INSTITUTE + PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-SA-3739 +. 19 PAGES, 40 REFERENCES, 3 FIGURES, 1 TABLE, MAY 1971

X WHILE INHALED HTO IS 100% RETAINED, LESS THAN 0.1% OF HT OR T2 IS RETAINED (NSIC NO. 64728). MAGNITUDE OF UNIDIRECTIONAL MOVEMENT OF HTO ACROSS INTACT SKIN BARRIER (DELONG, SCIENCE 114, 397 (1951)) WAS SURPRISING. ANIMALS (FROM 20-GM MOUSE TO 400,000-GM HORSE) CONTAIN ABOUT 60% BODY WATER WITH TURNOVER TIME INCREASING WITH BODY WT, KANGAROO RAT EXCEPTED (CF NSIC NO. 64770), LOG OF THE WATER LOSS PER DAY AN APPROXIMATE LINEAR FUNCTION OF LOG OF BODY WT (BUT SEE NSIC NO. 56158). THOMPSON, JBC 223, 795 (1956), MEASURED H3 LEVEL IN HI FROM ORGANIC MATTER OF RATS AND FOUND 20% EQUILIBRATION WITH BODY WATER H, I.E., THE SPECIFIC ACTIVITY OF ORGANIC H WAS 20% OF THAT OF BODY WATER H, ALMOST 40% IN BRAIN, LESS THAN 10% IN FAT. MORE CRUCIAL EXPTS WHERE TOTAL H INTAKE IS UNIFORMLY H3 LABELED ARE NEEDED (CF NSIC NO. 64770). IT IS USUALLY ASSUMED THAT IF A RADIONUCLIDE HAS A LONG BIOL HALF-LIFE ITS UPTAKE IS CORRESPONDINGLY LOW, WHICH IS ONLY TRUE FOR A STEADY-STATE SYSTEM. LARGE AMTS OF H3 COULD GET TRAPPED IN OOCYTES UNTIL OVULATION TIME. LOW-WATER TISSUES LIKE BONE AND FAT GET LOWER DOSE THAN REMAINDER OF BODY (BUT SEE NSIC NO. 64766). BRUES, PSEBM 79, 174 (1952), FOUND AN LD50(30) OF 1 MCI/GM IN MOUSE, IP, OR 300 RADS IN 1ST DAY (12 RADS/HR), H3 BETA 1.7 TIMES AS EFFECTIVE AS C060 GAMMA. MORE CHRONIC STUDIES NEEDED.

OXIDE + *WATER + CORRELATION + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + TOXICITY + SPECIFIC ACTIVITY + TURNOVER RATE + MAMMAL, SMALL + MAMMAL, RAT + MAMMAL, LARGE + EXPONENTIAL FUNCTION + EXPOSURE, CHRONIC + FAT + MAN + WHOLE BODY + *MASS + *ORGANIC + RETENTION FUNCTION + BRAIN + MONTH

064778
THOMPSON RC
EFFECT OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO TRITIUM OXIDE
HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
HW-30340 +. 34 PAGES, JANUARY 1, 1954(T3162)

X RECOMMENDATIONS ON MAX PERMISSIBLE TRITIUM IN MAN HAVE ALL BEEN BASED ON ASSUMPTIONS OF (1) UNIFORM DISTRIB THROUGH BODY, (2) H3 LOSS FROM BODY SAME AS WATER LOSS FROM BODY, (3) H3 IN BODY ONLY AS HTO, NONE OF WHICH ARE NECESSARILY VALID, PURPOSE OF PRESENT REVIEW TO ASSESS PROBABLE ERRORS OF SUCH ASSUMPTIONS, BY ANALYSIS OF DATA IN THOMPSON, JBC 200, 731 (1953) FOR RAT SINGLE IP, THOMPSON, JBC 208, 883 (1954) FOR RAT MULTIPLE IP, HW-30437 (1954) FOR RAT CHRONIC INGESTIONG, FOR SHEEP SINGLE IP, HW-28363 (1953) AND FOR MAN CHRONIC EXPOSURE, LA-1468 (1952). HW-30437 SHOWED THAT 2ND GENERATION RATS EXPOSED FROM CONCEPTION AER HIGHER IN BOUND H3 THAN MOTHER FOR BRAIN, HEART, LUNGS, STOMACH. HW-28363 SHOWED THAT FATTY TISSUES OF SHEEP RECEIVED ABSORBED DOSE AS LARGE AS AVERAGE TOTAL DOSE TO BODY WATER. AV WHOLE-BODY DOSE FROM ORGANICALLY BOUND H3 IS ABOUT 10% OF BODY WATER H3 DOSE, BUT DOSE FROM BOUND H3 TO SOME TISSUE FRACTIONS (FAT, COLLAGEN) MAY BE GREATER THAN THAT TO WHOLE ORGANS, EMPHASIZING ERROR THAT ASSUMPTION (1) ABOVE CAN INTRODUCE. EXPOSURE LIMITS MAY HAVE TO BE REDUCED BY A FACTOR OF AT LEAST 2 BECAUSE OF LONG-TERM BOUND H3 ACCUMULATION. SINCE SPACE DOES NOT PERMIT TABULATION OF TISSUE AND TISSUE FRACTION CONCNS, BIOL HALF-LIVES AND DOSES, SEE ORIGINAL. CF NSIC NOS. 64777,64767.

OXIDE + HAZARD, RELATIVE + WATER + DOSE CALCULATION, INTERNAL + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOCHEMICAL + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + CONCENTRATION + *DISTRIBUTION + BLOOD + BONE + MAMMAL, RAT + MAMMAL, LARGE + EXPONENTIAL FUNCTION + EXPOSURE, CHRONIC + EXPOSURE, IP + *FAT + KIDNEY + LIVER + LUNG + MAN + MUSCLE + SKIN + STOMACH + TESTIS + THYROID + *ORGANIC + RETENTION FUNCTION + BRAIN + HEART + MONTH + ORGAN, OTHER

064779
MIGHISSI AA + CARTER MW
LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY, LAS VEGAS, NEVADA + SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY, MONTGOMERY, ALABAMA
4 PAGES, 2 FIGURES, 2 TABLES, 12 REFERENCES, HEALTH PHYSICS, VOL. 21, PP. 57-60 (JULY 1971)(T7611)

CF NSIC NOS. 64778,64730,64729,64727. 2 YOUNG WOMEN (26 AND 29 YRS OF AGE IN 1967 WHEN MONITORING STARTED) LEFT PLANT WHERE THEY HAD BEEN TRITIUM LUMINOUS DIAL PAINTERS WHEN DRINKING WATER CONTAINED 0.8 NCI/L, DROPPING TO 0.4 NCI/L IN JUNE 1969. URINARY EXCRETION FOR 1 SUBJECT WAS 3.2 E (EXP -0.021T) + 0.5 E (EXP -0.000343T) WITH 2ND TERM CORRESPONDING TO 2020 DAY EFFECTIVE HALF-LIFE. 2ND SUBJECT WAS 2.3 E (EXP -0.033T) + 0.2 E (EXP -0.00246T) WITH 2ND TERM CORRESPONDING TO 280 DAYS. THERE WAS A SEASONAL VARIATION IN BODY BURDEN, INCREASED WATER INTAKE IN SUMMER DILUTING THE TISSUE H3 BEING CONSTANTLY RELEASED TO THE BODY WATER, FOR 1ST SUBJECT, BUT THIS EXPLANATION NOT TENABLE FOR 2ND SUBJECT WHOSE EXCRETION RATE WAS CONSTANT. SINCE INITIAL DECREASE IN BODY BURDEN WAS NOT MEASURED, DOSE ASSESSMENT COULD NOT BE MADE. 2ND SUBJECT WENT BACK TO TRITIUM WORK AND SO WAS NO LONGER AVAILABLE FOR FURTHER STUDY. THE 34-DAY COMPONENT OBSERVED BY SNYDER (NSIC NO. 49605) CONTRIBUTED 2% OF TOTAL DOSE. THE 230-DAY COMPONENT OF MINDER (NSIC NO. 49549) CONTRIBUTED 5%. SANDERS (NSIC NO. 49550) ESTIMATED AN ORGANIC-BOUND TRITIUM COMPARTMENT OF 28.5 KG FOR A 100 KG MAN. PRESENT AUTHORS WERE NOT ABLE TO ESTIMATE THEIR COMPONENT SIZES.

MONITOR, PERSONNEL + SURVEY, USPHS + ANALYTICAL TECHNIQUE + WATER, DRINKING + *PERSONNEL EXPOSURE, RADIATION +

064779 *CONTINUED*
RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + LUMINARY + *EXCRETION, URINE + EXPONENTIAL FUNCTION + MAN + MATURE + WHOLE BODY + FEMALE + IC GROSSLY NORMAL + VARIABILITY + YEAR

064780
MOGHISSI AA + TOERBER ED + REGNIER JE + CARTER MW + POSEY CD
HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING
SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY, MONTGOMERY, ALABAMA
7 PAGES, 2 FIGURES, 9 REFERENCES, HEALTH PHYSICS, VOL. 18, PP. 255-261 (1970)(T1782)

CF NSIC NO. 64779. THE 1963 ADDENDUM 1 TO NATL BUR STANDARDS HANDBOOK 69 (1959) ON MPBB AND (MPC)A AND (MPC)W FOR OCCUPATIONAL EXPOSURE REDUCED 40-HR WEEK (MPC)A FROM 2 X 10 (EXP -5) TO 5 X 10 (EXP -6) UCI/CC FOR BODY TISSUE AND FROM 2 X 10 (EXP -5) TO 8 X 10 (EXP -6) UCI/CC FOR TOTAL BODY. IN COOPERATION WITH GEORGIA DEPT PUBLIC HEALTH THE SE RADIOL HEALTH LAB OF USPHS AT MONTGOMERY, ALABAMA STUDIED A PLANT IN SE USA USING 2000 CI OF TRITIUM ANNUALLY AND EMPLOYING 15-20 WORKERS. THE LUMINOUS PAINT USED CONSISTED OF ZNS COATED WITH A TRITIATED POLYMER AND MIXED WITH AN ADHESIVE DISSOLVED IN ORGANIC SOLVENT, PLANT RECEIVING DIFF GRADES OF THE REACTIVE POWDER RANGING FROM SP ACT OF 9 TO 250 MCI/GM, DILUTING WITH ZNS AS NEEDED IN GLOVE BOX VENTED TO OUTSIDE. TRITIUM CONCN IN AIR OF WORKING AREA WAS USUALLY 2 TO 3 NCI/L (NBS 69 ADDENDUM OF 1963 RECOMMENDATION BEING 5 NCI/L MAXIMUM). 5 TO 10% OF THE TOTAL PLANT AIR ACTIVITY WAS ASSOCD WITH PARTICULATES. MAJOR PORTION OF H3 COLLECTED WAS AS WATER, SUGGESTING HYDROGEN EXCHANGE BETWEEN ATMOS MOISTURE AND THE TRITIATED PAINT POLYMER AS WITH NSIC NO. 64730. 16.8 EMPLOYEES APPLYING 146 CI/MONTH AVERAGED 20.4 UCI/L IN URINE. 1.3 CI H3 IN 1 GM LUMINOUS PAINT PRODUCES EQUIV OF 100 MICROLAMBERTS. BENEFIT OF PRODUCING 1 GRAM-MICROLAMBERT HAS A RISK OF 0.16 MILLIREMS.

MONITOR, PERSONNEL + *INDUSTRY, MANUFACTURING + MONITOR, AIR + SURVEY, USPHS + *AIR + DOSE CALCULATION, INTERNAL + MONITOR, BACKGROUND + ICRP + PERSONNEL EXPOSURE, RADIATION + RADIATION, PUBLIC EDUCATION + UNITED STATES + NBS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + LUMINARY + *EXCRETION, URINE + MAN + MATURE + *ORGANIC + *BENEFIT VS RISK + IC GROSSLY NORMAL + PHYSICOCHEMICAL FORM

064782
CHISWELL WD + DANCER GHC
MEASUREMENT OF TRITIUM CONCN IN EXHALED WATER VAPOUR AS A MEANS OF ESTIMATING BODY BURDENS
THE RADIOCHEMICAL CENTRE, UNITED KINGDOM ATOMIC ENERGY AUTHORITY, AMERSHAM, BUCKINGHAMSHIRE, ENGLAND
4 PAGES, HEALTH PHYSICS, VOL. 17, PP. 331-334 (1969)(T7612)

FACTORY WORKERS WOULD PREFER BREATH TO URINE MONITORING BECAUSE OF THEIR LOW-ENERGY RADIATION, H3 AND PM147 ARE PREFERABLE TO RA226 FOR LUMINOUS PAINTS SO FAR AS PUBLIC IS CONCERNED, BUT DIFFICULTY IN FACTORY MONITORING OF H3 CAUSED 2 FACTORIES TO RETURN TO RA226 (NSIC NO. 64784). 30 MIN AFTER SINGLE EXPOSURE, H3 CONCN IN EXHALED WATER APPROACHES THAT IN URINE AND VENOUS BLOOD (NSIC NOS. 64727, 64783). 3 METHODS OF EXTRACTING H2O VAPOR FROM EXHALED BREATH WERE STUDIED - (1) COLD TRAP, (2) SILICA GEL, (3) MOLECULAR SIEVE - (3) MORE SUITABLE THAN (2) ACCORDING TO AUTHORS SINCE IT COULD BE HEATED TO HIGH TEMP FOR COMPLETE REMOVAL OF UNTRITIATED H2O WITHOUT INACTIVATION, (2) GIVING A MEAN URINE/BREATH RATIO (UCI/L) OF 1.35 (RANGE OF 1.1 TO 1.5 FOR 9 SAMPLES FROM 6 SUBJECTS), (3) GIVING A SPREAD FROM 0.4 TO 1.4, HISTOGRAM MAX AT 1.0 (50 SAMPLES FROM 11 SUBJECTS), RATIOS LESS THAN 1 THOUGHT DUE TO INSUFFICIENT TIME FOR BODY EQUILIBRATION BEFORE THE ANALYSIS, BUT NOT TESTED EXPERIMENTALLY AS OF PUBLICATION. ONE SUBJECT REMOVED FROM H3 WORK 3 DAYS BEFORE SAMPLING STARTED SHOWED URINE/BREATH RATIO GREATER THAN 1 UP TO 30 DAYS MEASURED. AUTHORS SUGGEST METHOD IS SUFFICIENTLY ACCURATE FOR ROUTINE MONITORING OF BODY BURDENS.

*MONITOR, PERSONNEL + UNITED KINGDOM + INDUSTRY, MANUFACTURING + *ANALYTICAL TECHNIQUE + PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + *RESPIRATION + PHYSIOLOGY/METABOLISM + LUMINARY + *EXCRETION, URINE + MAN + MATURE + ORGANIC + *BODY BURDEN + BENEFIT VS RISK + IC GROSSLY NORMAL + VARIABILITY + PHYSICOCHEMICAL FORM

064784
VENNART J
USE OF RADIOACTIVE LUMINOUS COMPOUND AND NEED FOR BIOLOGICAL MONITORING OF WORKERS
RADIOLOGICAL PROTECTION SERVICE, BELMONT, SUTTON, SURREY, ENGLAND
6 PAGES, HEALTH PHYSICS, VOL. 13, PP. 959-964 (1967)(T1782)

CF NSIC NO. 64782. ESTABLISHING A BENEFIT/RISK RATIO FOR NFG OF TRITIATED LUMINOUS PAINTS (NSIC NO. 64780) HAS ITS PROBLEMS (NSIC NOS. 64778, 64777, 64766, 64730. OF PARTICULAR CONCERN WOULD BE CHRONIC EXPOSURE TO A NOVEL FORM OF TRITIUM (E.G. TRITIATED DEGRADATION PRODUCT FROM INTERACTION OF TRITIATED POLYSTYRENE WITH LACQUER) CAPABLE OF CONCENTRATION AND LONG-TERM STORAGE IN A SMALL VOLUME OF TISSUE, IMPOSSIBLE TO EVALUATE BY WHOLE-BODY COUNTING, INCONVENIENT TO MONITOR ROUTINELY. URINE, BREATH, BLOOD OR OTHER BIOASSAY SHOULD BE QUICK, CONVENIENT AND CHEAP AND YET REFLECT ACCURATELY NOT ONLY WHOLE-BODY BURDEN, BUT LOCALIZED CONCN WHICH MIGHT GIVE RISE TO RADIATION PATHOLOGY SUCH AS CANCER OR GENETIC MUTATION. THOUGH A MAJOR PORTION OF VOLATILE TRITIUM EMITTED FROM TRITIATED PATIN POLYMER IS IN THE FORM OF HTO (NSIC NO. 64780), ASSESSMENT OF THE MINOR PORTION SHOULD ALSO BE MADE. HOUSEKEEPING CANNOT BE TIGHTENED UP, OTHER ALTERNATIVES INCLUDE USE OF PM147, OR REVERTING BACK TO THE UNDESIRABLE RA226 AS 2 BRITISH FIRMS DID. WORKERS AT 1 FACTORY REACHED 1 MPBB OF 2 MCI IN THEIR BODIES (ASSUMING IT ALL PRESENT IN BODY AS HTO) WITHIN A VERY FEW EEEKS. THEN WERE REPLACED BY WORKERS WITH LOW H3. CF KNAPTON, HP 20, 345 (1971).

MPBB + MONITOR, PERSONNEL + UNITED KINGDOM + INDUSTRY, MANUFACTURING + ANALYTICAL TECHNIQUE + PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + LUMINARY + EXCRETION, URINE + MAN + MATURE + ORGANIC + BODY BURDEN + BENEFIT VS RISK + PHYSICOCHEMICAL FORM

064785
DROBINSKI JC + LAGATTA DP + GOLDIN AS + TERRILL JG
ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM
NORTHEASTERN RADIOLOGICAL HEALTH LABORATORY, DIVISION OF RADIOLOGICAL HEALTH, PUBLIC HEATLH SERVICE, WINCHESTER, MASSACHUSETTS
11 PAGES, 8 FIGURES, 4 TABLES, 35 REFERENCES, HEALTH PHYSICS, VOL. 11, PP. 385-395 (1965)(T1785)

1952 OFTEN USED AS BENCH-MARK FOR ASSESSING C14 LEVELS (START OF HIGH YIELD DEVICE TESTING), PRE-1952 BASELINE ESTIMATED AT 14 +-1 D/MIN/GM OF C IN BIOSPHERE, NSIC NO. 64786. MENEELY (1962) REPORTED 65% INCREASE OVER BACKGROUND (23 D/MIN/GM C) AS OF 1958. ASSUMING CESSATION OF ALL TESTING IN WORLD, SEVERAL CENTURIES WILL BE REQUIRED FOR ENVIRONMENTAL LEVELS TO RETURN TO PRE-1952 BACKGROUND, WHICH MAY OR MAY NOT BE OF GENETIC SIGNIFICANCE TO THE HUMAN RACE AND OTHER LIVING SYSTEMS. H3 LEVELS ARE MORE VARIABLE HTAN C14, KAUFMAN (1953) REPORTING 3 TO 30 PCI/L AS PRE-1952 H3 LEVEL IN WATERS AND WINES, BIOSPHERE INCREASING TO 300 TO 50,000 PCI/L THEREAFTER, TRITIUM IN ATMOSPHERIC HYDROGEN GAS INCREASING FROM 430 PCI/GM OF HYDROGEN IN 1954 TO 29,000 IN 1962 (NSIC NO. 64787). FRC 3, 3(1962) CLAIMED THAT MUTATIONS EXPECTED FROM C14 OVER ALL TIME (THOUSANDS OF YRS) WILL BE GREATER THAN FOR ANY OTHER RADIONUCLIDE, BUT WITH FEWER MUTATIONS PER GENERATION. VALUES FOR BIOL HALF-LIFE OF C14 HAVE RANGED FROM 10 TO 180 DAYS, EXCLUSIVE OF THE 5% LONG-TERM COMPONENT IN BONE. BECAUSE OF SHORTER PHYSICAL HALF-LIFE, H3 NOT CONSIDERED AS HAZARDOUS AS C14. PRESENT STUDY GIVES C14 AND H3 CONTENTS OF CANNED MEATS, AND 14 CONTENTS OF HUMAN LIVER, KIDNEY, HEART, BLOOD AND OF MILK, EGGS, POTATOES, APPLIES, ORANGES AND OF AIR IN VARIOUS CITIES FOR 1962-4. DATA TOO DETAILED FOR LIMITED SPACE HERE.

CARBON + FALLOUT + INGESTION + INHALATION + AIR + MILK + DIETARY HABIT + WATER, DRINKING + *POPULATION EXPOSURE + CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + VEGETATION + CONCENTRATION + DISTRIBUTION + BLOOD + BONE + EGG + KIDNEY + LIVER + MAN + FOOD INTAKE + *EXPOSURE, BACKGROUND + HEART

065122
CAHILL DF
SOME EFFECTS ON MAMMALIAN DEVELOPMENT OF CONTINUOUS IRRADIATION IN UTERO WITH TRITIATED WATER
ROCHESTER UNIVERSITY, NEW YORK DEPT. OF RADIATION BIOLOGY AND BIOPHYSICS
UR-49-1254 +. 86 PAGES, 1970

TO INVESTIGATE THE CONSEQUENCES OF CONTINUOUS, IN UTERO EXPOSURE TO HTO, GROUPS OF 12-17 SPRAGUE-DAWLEY RATS WERE MAINTAINED AT BODY WATER LEVELS OF 0, 1, 10, 20, 50, 75, AND 100 MICROCURIES/ML HTO THROUGH PREGNANCY. THE INITIAL MATERNAL BODY BURDENS WERE ESTABLISHED ON THE DAY OF POSITIVE SPERM DETERMINATION BY INTRAPERITONEAL INJECTION OF HIGH SPECIFIC ACTIVITY HTO. BODY WATER HTO LEVELS WERE THEN MAINTAINED AT A CONSTANT LEVEL DURING PREGNANCY BY PROVIDING HTO IN DRINKING WATER SUPPLIES. THESE HTO ACTIVITIES PROVIDED IRRADIATION AT 0.3 - 30 RADS/DAY TO THE EMBRYO AND FETUS DURING DEVELOPMENT

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + EFFLUENT + MEASUREMENT + *WATER + REACTOR, POWER + *WATER, DRINKING + *EXPERIMENT + FUEL REPROCESSING + CONCENTRATION + RADIATION EXPOSURE, CHRONIC + *RADIATION EFFECT + *MAMMAL, RAT + *BODY BURDEN

065162
MOGHISSI AA + CARTER MW + LIEBERMAN R
LONG-TERM EVALUATION OF TGE BIOLOGICAL HALF-LIFE OF TRITIUM
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY, MONTGOMERY, ALABAMA
3 PAGES, HEALTH PHYSICS, 21(1), PAGE 57-60, (JULY 1971)

THE BODY BURDEN OF TWO TRITIUM LUMINOUS DIAL PAINTERS HAVE BEEN FOLLOWED SINCE THE FALL OF 1967. URINE COLLECTIONS BEGAN 6-10 MONTHS AFTER TERMINATION OF WORK INVOLVING OCCUPATIONAL EXPOSURE TO TRITIUM. IN BOTH CASES, AN INTERMEDIATE T-SUB-I AND A LONG T-SUB-I HALF-LIFE COMPONENT COULD BE OBSERVED. ONE INDIVIDUAL EXHIBITED A T-SUB-I OF 21 DAYS AND A T-SUB-1 OF 280 DAYS, WHEREAS THE SECOND WORKER SHOWED A T-SUB-I OF 33 DAYS AND A T-SUB-1 OF 2020 DAYS. A SURPRISINGLY HIGH SEASONAL DEPENDENCE OF TRITIUM BODY WATER CONCENTRATION WAS OBSERVED IN ONE CASE. THIS RESULTED IN AN INCREASE OF TRITIUM CONCENTRATION IN BODY WATER IN WINTER AS COMPARED TO THE PREVIOUS SUMMER.

*MEASUREMENT + *WATER + PERSONNEL EXPOSURE, RADIATION + *BIOLOGICAL HALF-LIFE + CONCENTRATION + BODY BURDEN + BODY FLUID

065195
ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON ENVIRONMENTAL QUALITY
376 PAGES, COUNCIL ON ENVIRONMENTAL QUALITY, (AUGUST 1970)

REPORT DESCRIBES CONDITIONS OF OUR ENVIRONMENT, IDENTIFIES MAJOR TRENDS, PROBLEMS, ACTIONS UNDER WAY, AND OPPORTUNITIES FOR THE FUTURE. COUNCIL ADMITS PRESENT INSUFFICIENCY OF ENVIRONMENTAL QUALITY INDICATORS OR SYSTEMS, HENCE THAT THIS REPORT IS INCOMPLETE AND CAN ONLY BRING TOGETHER PROBLEMS AND ISSUES. OF PARTICLLAR INTEREST TO NUCLEAR COMMUNITY IS SECTION ON RADIATION, I.E., EFFECTS OF RADIATION, SOURCES OF RADIATION, REACTOR-SAFETY RECORD, RADIOACTIVE WASTE STORAGE AND DISPOSAL, STANDARDS FOR PROTECTION AGAINST RADIATION, AND WHAT NEEDS TO BE DONE -- (1) RESEARCH ON EFFECTS OF LOW-LEVEL DOSES AND CUMULATIVE EFFECT, (2) PROBLEMS ARISING FROM MEDICAL USES AND FROM CONSUMER PRODUCTS, (3) CAREFUL REGULATION AND CONTROL OF RELEASES FROM REACTORS, UNDERGROUND TESTING, AND TRANSPORTATION, STORAGE, AND DISPOSAL OF RADIOACTIVE WASTES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

065195 *CONTINUED*
CODES AND STANDARDS + EFFLUENT + KRYPTON + REGULATION, STATE + WASTE STORAGE + ELECTRIC POWER + BIOTA + WASTE MANAGEMENT + *RADIATION SAFETY AND CONTROL + *ENVIRONMENT + FUEL REPROCESSING + SURVEY + DATA COLLECTION + EFFECT, GENETIC + POLLUTION + RADIATION EFFECT + RADIATION EXPOSURE + AGENCY, FEDERAL + N-POWER, SAFETY OF + SPOKESMAN, FEDERAL

065198
JAEGER RG
THE WORK OF INTERNATIONAL ORGANIZATIONS IN THE FIELD OF RADIOLOGY
10 PAGES, ROENTGENPRAXIS, 20, PAGES 126-134, (JUNE 1967)(IN GERMAN)

REPORT OF AGENCIES OF THE UN PRODUCTION OF 3-VOLUME REFERENCE SERIES COVERING ALL ASPECTS OF RADIATION. VOLUMES ALREADY PUBLISHED INCLUDED REPORTS ON USE OF RADIONUCLIDES, HIGH-VOLTAGE RADIOTELETHERAPY, TOXICITY OF NUCLIDES, SAFE HANDLING, REMOVAL OF FALLOUT, SAFETY STANDARDS, AND NORMS OF RADIOPROTECTION. FURTHER SUBJECTS DISCUSSED INCLUDED USE OF WHOLE-BODY COUNTER, ENVIRONMENTAL CONTAMINATION, STANDARDS AND DOSES AND MEASUREMENT OF NUCLIDE CONCENTRATIONS, DOSIMETRY OF X RADIATION, ACCURACY AND REPRODUCIBILITY OF STANDARDS AND ABSORBED DOSES. THE 3RD VOLUME ANNOUNCED IN THIS ARTICLE CONCERNED C-14, H-3, I-125, P-32, AND S-35. AVAILABILITY AND SOURCES OF PUBLICATIONS CITED IN THESE VOLUMES ARE GIVEN.

CARBON + *CODES AND STANDARDS + DOSE + FISSION PRODUCT RELEASE + IODINE + TRANSPORTATION AND HANDLING + PHOSPHORUS + SULFUR + *RADIATION SAFETY AND CONTROL + RADIOACTIVITY RELEASE + RADIOISOTOPE + RADIOGRAPHY + X-RAY + *INTERNATIONAL + THERAPY + ORGANIZATION, INTERNATIONAL

065253
MOGHISSIS AA + PATZER RG
HEALTH PHYSICS ASPECTS OF TRITIUM
1 PAGE, AMERICAN NUCLEAR SOCIETY TRANSACTIONS, 14(1), PAGE 163, (JUNE 1970)

TRITIUM RELEASED TO THE GENERAL ENVIRONMENT ENTERS ECOLOGICAL CYCLES SUCH AS THE AIR-PLANT, PLANT-ANIMAL, PLANT-MAN, AND ANIMAL-MAN LINKS. TRITIUM BEHAVIOR IN THE AQUEOUS PART OF EACH OF THESE LINKS CAN BE DESCRIBED BY SIMPLE MATHEMATICAL EQUATIONS. HOWEVER, THE INTERACTIONS OF TRITIUM WITH ORGANIC COMPOUNDS PRESENT IN TISSUE OF EACH ONE OF THESE LINKS IS COMPLICATED AND, TO A GREAT EXTENT, UNDEFINED.

DOSE + EQUATION + *INGESTION + *INHALATION + *ANALYTICAL TECHNIQUE + RADIOACTIVITY RELEASE + MATHEMATICAL TREATMENT + *ABSORPTION + *CONCENTRATION + EXCRETION, URINE + *MAN + *SKIN + BIOLOGICAL CONTROL + ORGANIC

065296
SPEECH BY PAUL C. TOMPLINS, EX. DIR., FRC
20 PAGES, HEARING BEFORE JCAE CONF. ON ENVIRONMENT EFFECTS OF PRODUCTING ELECTRICAL POWER, (NOVEMBER 1969)

SPEAKER GIVES A HISTORY OF DEVELOPMENT OF RADIATION GUIDELINES AND OF VARIOUS BODIES FORMED TO DEVELOP THESE STANDARDS, THIS FROM 1928 TO THE PRESENT. HE SHOWS HOW THE VARIOUS BASES WERE FORMULATED AND IN THE COURSE OF TIME, AS CIRCUMSTANCES DEMANDED (E.G., MANHATTAN PROJECT, 1950 ATMOSPHERIC TESTS, ETC.), EVALUATIONS WERE INTENSIFIED AND MODIFIED. AS TIME PROGRESSED, MORE AUTHORITATIVE AND PRESTIGIOUS BODIES WERE ORGANIZED AND THEIR EXHAUSTIVE STUDIES LED TO BETTERMENT OF UNDERSTANDING OF RADIATION EFFECTS AND SETTING OF REVISED STANDARDS. HE PRESENTS A NUMBER OF IMPORTANT FINDINGS THAT WERE LISTED IN THE 1962 REPORT OF UNSCEAR WHICH OUTLINED AREAS WHERE RELIABLE ASSUMPTIONS MUST BE MADE BUT WHERE FURTHER EXPERIMENTAL DATA IS ALMOST MANDATORY ALTHOUGH FREQUENTLY DIFFICULT TO ACHIEVE. HE SHOWS HOW FRC PRESENTLY ARRIVES AT ITS CONCLUSIONS AND THROUGH WHAT IT ACQUIRES ITS INFORMATION.

CARBON + *CODES AND STANDARDS + FISSION PRODUCT RELEASE + IODINE + STRONTIUM + RADIUM + ICRP + NCRP + RADIOACTIVITY RELEASE + EFFECT, GENETIC + EFFECT, SOMATIC + RADIATION EXPOSURE + DNA + AGENCY, FEDERAL + *FPC + *SPOKESMAN, FEDERAL

065420
SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC
70 PAGES, FIGURES, TABLES, HEARINGS BEFORE JCAE CONF. ON ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER, (OCTOBER 30, 1969)

A COMPREHENSIVE SUMMARY OF THE ACTIVITIES OF THE AEC IN ENVIRONMENTAL STUDIES IS PRESENTED BY THE SPEAKER. CONCERNING SOMATIC EFFECTS, HE REMARKS THAT AT PRESENT, IT IS NOT CLEAR WHETHER SOME OBSERVED LATE EFFECTS OF RADIATION HAVE A THRESHOLD DOSE FOR PRODUCTION. HE DETAILS SOMATIC AND GENETIC EFFECTS, DROSOPHILA AND MOUSE EXPERIMENTS, TRITIUM AND KRYPTON BIOLOGICAL-HALF-LIVES, NATURAL PRODUCTION AND CONCENTRATION OF FORMER, DNA MECHANISM, AND HUMAN EXPOSURE TO BOTH GASES. RADIOACTIVE-EFFLUENT-CONTROL RESEARCH AND DEVELOPMENT ARE REVIEWED. THESE INCLUDE DESCRIPTIONS OF THE MANY PROCESSES EXAMINED AND USED IN RECOVERING AND TREATING NUCLIDES FROM PROCESSING WASTE STREAMS. RADIOACTIVE GAS CONTROL MEASURES ARE ALSO COVERED. THE FATE OF HEAVY-METAL NUCLIDIC DISCHARGES INTO STREAMS IS COVERED, AS ARE THE VARIOUS METHODS OF DISPOSING OF THE WASTES BY SUCH METHODS AS HYDRAULIC FRACTURING -- AND DISPOSAL OF RADIOACTIVE GASES INTO POROLS AND UNDERGROUND FORMATIONS. OTHER TOPICS EVALUATED AND DISCUSSED IN DETAIL CONCERN METEOROLOGICL AND THERMAL EFFECTS STUDIES.

CESIUM + COBALT + FISSION PRODUCT RELEASE + GEOLOGY + RUTHENIUM + STRONTIUM + ZINC + POPULATION EXPOSURE + WASTE MANAGEMENT + HYDROLOGY + *RADIATION SAFETY AND CONTROL + RADIOACTIVITY RELEASE + METEOROLOGY + THERMAL POLLUTION + CALVERT CLIFFS 1 (PWR) + DATA COLLECTION + EFFECT, GENETIC + EFFECT, SOMATIC + RADIATION EFFECT + AGENCY, AEC + CHESAPEAKE BAY + *N-POWER, SAFETY OF + *SPOKESMAN, AEC

065659
MARTIN R
EFFECTS OF TRITIUM DECAY ON DNA
NORTHWEST UNIVERSITY, CHICAGO, ILLINOIS, DEPT. OF MICROBIOLOGY
COO-1603-3 +. 6 PAGES, SEPTEMBER 30, 1969

REPORTS ON STUDY TO EXAMINE - (1) THE EFFECTS OF VARYING DOSES OF TRITIUM, INCORPORATED INTO VARIOUS MACROMOLECULES OF THE CELL, ON CELL VIABILITY, ON MUTATION FORMATION AND ENZYME FORMING ABILITY, (2) THE EFFECTS OF TRITIUM DECAYS ON LABELED DNA ISOLATED AND STORED FROZEN, AND (3) THE EFFECTS OF ALTERED DNA REPAIR MECHANISMS AND/OR RADIOPROTECTIVE AGENTS ON SENSITIVITY TO TRITIUM DECAYS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*CHROMOSOMAL EFFECT + TEMPERATURE + *RADIATION EFFECT + DNA + CELL + ENZYME + MUTATION + CHELATE + *EFFECT, DOSE

065935
KAUFMAN SL + COLVIN MC + LIEBERMAN R + MOGHISSI AA + REHNBERG BF + MCMILLAN RC
INVESTIGATION OF TRITIATED LUMINOUS COMPOUNDS
ENVIRONMENTAL PROTECTION AGENCY, RADIATION RESEARCH, ROCKVILLE, MARYLAND
EERL-71-2 +. 14 PAGES, 2 FIGURES, 4 TABLES, JUNE 1971

THE CUTANEOUS AND GASTROINTESTINAL TRACT ABSORPTION OF FOUR TRITIATED LUMINOUS COMPOUNDS WAS STUDIED IN EXPERIMENTAL ANIMALS. THE PERCENT ABSORPTION OF THE INDIVIDUAL COMPOUNDS VIA THE CUTANEOUS ROUTE VARIED FROM 0.10 TO 8.83% AND VIA THE GASTROINTESTINAL ROUTE FROM 0.67 TO 21.55%. THE DATA SHOW A POSITIVE CORRELATION BETWEEN THE RELATIVE ABSORPTION OF THE INDIVIDUAL LUMINOUS COMPOUNDS THROUGH BOTH THE CUTANEOUS AND GASTROINTESTINAL ROUTES. TRITIUM ACTIVITY WAS ELIMINATED IN TWO COMPONENTS. A SLOW COMPONENT WAS SEEN TO REPRESENT TRITUM ACTIVITY IN THE FORM OF TRITIATED WATER (HTO), WHILE A MORE RAPID COMPONENT WAS THOUGHT TO BE TRITIUM INCORPORATED IN OTHER COMPOUNDS SOLUBLE IN URINE AND OTHER BODY FLUIDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ABSORPTION + ANIMAL + *COMPARISON + *LUMINARY + EXCRETION, URINE + *GI TRACT + *SKIN + BODY FLUID

066272
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-3961 +. 49 PAGES, 1971

INCLUDES A 600-WORD TOPICAL SUMMARY ON GENETIC EFFECTS AT LOW DOSES. 200-300 WORD SUMMARIES ON PROJECTS IN THE SECTIONS, BIOLOGY (BIOCHEMISTRY AND MOLECULAR BIOLOGY, GENETICS AND POPULATIONS), AND POPULATION RESEARCH (HEREDITARY CHANGES IN VERTEBRATES, SOMATIC, AND GENETIC HARM IN HUMAN POPULATIONS). 50-150 WORD SUMMARIES IN THE SECTIONS, ENVIRONMENTAL RESEARCH (OFF-SITE AND EFFLUENT MONITORING, RADIOECOLOGY, PRODUCTIVITY STUDIES BY THE C-14 TECHNIQUE, RADIATION PROCESSING OF WASTE WATER, LOW LEVEL COUNTING) AND HEALTH PHYSICS (PLASTIC FILM-FISSION FRAGMENT NEUTRON DOSIMETRY, NAI DETECTOR EFFICIENCY, THERMOLUMINESCENCE DOSIMETRY, TRITIUM MONITORING, RADIATION INSTRUMENT DEVELOPMENTS).

*BIOMEDICAL + DOSIMETRY + EFFLUENT + STRONTIUM + WASTE TREATMENT + XENON + DOSIMETRY, THERMOLUMINESCENCE + POPULATION EXPOSURE + CHALK RIVER + MONITORING PROGRAM, ENVIRONMENTAL + PLASTICS + LAKE + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + PHYSIOLOGY/METABOLISM + EFFECT, GENETIC + EFFECT, SOMATIC + *RADIATION EXPOSURE, CHRONIC + TRACE ELEMENT + MAN + RADIATION MONITORS

066331
BUSTAD LK + DAVIS CW + MAYS MG + ROSENBLATT LS + HETHERINGTON NW + BAIR WJ + MCCLELLAN RO + RICHMOND CR + ROWLAND RE
EVALUATION OF LONG TERM EFFECTS OF EXPOSURE TO INTERNALLY DEPOSITED RADIONUCLIDES
RADIOBIOLOGY LABORATORY, UNIVERSITY OF CALIFORNIA
A/CONF-49/P-081 +. 2 PAGES, PAPER PRESENTED AT THE FOURTH UNITED NATIONS INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, SEPTEMBER 16, 1971

THE PURPOSE OF THIS PAPER IS TO SUMMARIZE THE LATE EFFECTS OF EXPOSURE OF ANIMALS AND MAN TO SOME OF THE MORE BIOLOGICALLY SIGNIFICANT RADIONUCLIDES. FOR THIS DISCUSSION SEVERAL NUCLIDES WERE CHOSEN THAT ARE OF PRACTICAL SIGNIFICANCE AND THAT REPRESENT A SPECTRUM OF RADIATION DOSAGE AND EFFECTS MODELS THAT CAN BE EXPECTED FROM EXPOSURE TO INTERNALLY DEPOSITED RADIONUCLIDES. THE MOST COMMON LATE EFFECT OBSERVED FOLLOWING LARGE DOSES OF THESE RADIONUCLIDES IS THE EARLY APPEARANCE OF TUMORS IN THE IRRADIATED TISSUES. ALTHOUGH THE BASIC MOLECULAR MECHANISMS ASSOCIATED WITH CANCER INDUCTION FROM RADIATION ARE NOT FULLY UNDERSTOOD, OBSERVATIONS TO DATE INDICATE FIVE GENERAL CONCLUSIONS, WHICH ARE SPECIFICALLY ILLUSTRATED FOR THE RADIONUCLIDES CHOSEN.

CESIUM + DEPOSITION + IODINE + PLUTONIUM + STRONTIUM + RADIUM + RADIONUCLIDE, INDUCED + ANIMAL + CHROMOSOMAL EFFECT + PHYSIOLOGY/METABOLISM + *RADIATION EFFECT + *RADIATION EXPOSURE + MOLECULAR EFFECT + *CANCER + MODEL, BIOLOGICAL + EFFECT, DOSE RATE + *MAN + *TUMOR + EFFECT, DOSE

066510
HEALY JW
LOS ALAMOS HANDBOOK OF RADIATION MONITORING, 1970
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-4400 +. 219 PAGES, FIGURES, TABLES, 1970

SINCE 1958, THERE HAVE BEEN MANY CHANGES IN THE TECHNOLOGY OF RADIATION PROTECTION AND IN THE MEANS OF MOST EFFECTIVELY IMPLEMENTING THIS TECHNOLOGY. IN THE PRESENT REVISION OF THE HANDBOOK, THE ARRANGEMENT HAS BEEN CHANGED TO PERMIT INCLUSION OF MORE BACKGROUND INFORMATION, AND SUPPLEMENTARY TABLES OF DATA ARE GATHERED IN APPENDIXES. DESPITE THE WIDE CIRCULATION OF THE PREVIOUS EDITIONS, THE PURPOSE OF THE HANDBOOK REMAINS THAT OF SERVING THE NEEDS OF THE LOS ALAMOS SCIENTIFIC LABORATORY.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*CODES AND STANDARDS + DECONTAMINATION + MEASUREMENT + MONITOR, EMERGENCY + *MONITOR, GENERAL PRACTICE + *MONITOR, PERSONNEL + PERSONNEL PROTECTIVE DEVICE + PLUTONIUM + WASTE DISPOSAL + *SAMPLING + MONITOR, ENVIRONMENTAL + *MONITOR + *RADIATION SAFETY AND CONTROL + *SAFETY PRINCIPLES AND PHILOSOPHY + MONITORING SYSTEM, RADIATION + RADIATION MONITORS

067088
OSBORNE RV
PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER LABORATORIES
15 PAGES, RADIATION RESEARCH, VOL. 50, PP. 197-211 (1972)

THE BENEFIT OF PRODUCING 1 GRAM-MICROLAMBERT HAS A RISK OF 0.16 MILLIREM ACCORDING TO ONE TRITIUM LUMINOUS PAINT PLANT STUDY (NSIC NO. 64780), EMPLOYEES AVERAGING 20 UCI/L IN URINE. WORKERS AT ONE PLANT REACHED ONE MAX-PERMISSIBLE BODY BURDEN WITHIN A FEW WEEKS (NSIC NO. 64784), NAMELY 2000 UCI, ASSUMING ALL BODY TRITIUM IN HTO FORM AND ASSUMPTION WHICH HAS BEEN QUESTIONED (NSIC NO. 64766). FOR ADDNL ASSUMPTIONS ABOUT TRITIUM EXPOSURE IN MAN SEE NSIC NOS. 64778, 64777,64775,64776, 64773. URINARY TRITIUM OF PERSONS WEARING TRITIUM-ACTIVATED LUMINOUS-DIAL WRIST WATCHES MAY AVERAGE 3 NCI/L AS AGAINST 0.7 +-0.2 FOR THOSE WHO DO NOT (NSIC NO. 67089). -- PURPOSE OF PRESENT REVIEW BY OSBORNE WAS TO RELATE TRITIUM LEVELS IN MAN AND HIS ENVIRONMENT TO A DOSE EQUIVALENT FOR MAN. ABOUT 40% OF A PERSON'S WATER THROUGHPUT IS TAKEN IN AS DRINKING WATER (FOOD WATER EXCLUDED), HENCE H3 CONCN IN BODY WATER TAKEN TO BE 40% OF THAT INGESTED. HIGHEST WATER CONCN OF 80% IS IN GONADS OR 32% OF INGESTED WATER. ASSUME GONADS 100% WATER. THEN AT BODY WATER H3 OF 69 UCI OR 1.6 UCI/KG, DOSE-EQUIV RATE IS 170 MREM/YR TO GONADS; THE AVERAGE POPULATION DOSE-RATE LIMIT RECOMMENDED BY NCRP 39 (1971). USING ICRP 2 (1959) AND ICRP 10 (1968)(NSIC NO. 64775) ASSUMPTIONS, OSBORNE ESTIMATES A CHRONICALLY MAINTAINED BODY BURDEN OF 91 UCI OF H3 AS AGAINST 69 BY ICRP TO DELIVER 170 MREM/YR WHEN INGESTED WATER CONTAINS 4.7 UCI/KG AS AGAINST 1.6, OR CORRESPONDING AIR CONCNS AT 0.16 AND 0.08 UCI/M3 RESPECTIVELY.

BIBLIOGRAPHY + HYDROGEN + INGESTION + INHALATION + *MPBB + MPC + OXIDE + HAZARD, RELATIVE + WATER + AIR + DOSE CALCULATION, INTERNAL + WATER, DRINKING + POPULATION EXPOSURE + ICRP + NCRP + PERSONNEL EXPOSURE, RADIATION + ENVIRONMENT + *REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + EFFECT, GENETIC + DNA + MODEL, BIOLOGICAL + EXPOSURE, ACUTE + EXPOSURE, CHRONIC + MAN + NATURE + BENEFIT VS RISK + BODY FLUID

067136
VENNART J
DOSIMETRY OF H-3 AND C-14 COMPOUNDS (T1797)
M.R.C. RADIOBIOLOGY UNIT, HARWELL, DIDCOT, BERKSHIRE, ENGLAND
1 PAGE, 7 REFERENCES, JOURNAL OF NUCLEAR MEDICINE, 44(527), PP. 908 (1972)

CF NSIC NOS. 49586,49712. RADIATION PROTECTION STANDARDS HAVE BEEN DERIVED BY ASSUMING LINEAR RELATION BETWEEN DOSE AND EFFECT AND EXTRAPOLATING FROM HIGHER EXPTL DOSES TO LOWER (APPROACHING BACKGROUND) THEORETICAL DOSES, ASSUMING UNIFORM DISTRIBUTION OF DOSE IN BODY OR ORGAN OR TISSUE. BECAUSE OF SHORT-RANGE FOR TRITIUM AND CARBON BETAS, NON-UNIFORMITY OF DOSE SHOULD BE CONSIDERED AT CYTO-HISTOLOGICAL LEVEL, AND TRANSMUTATION OF H3 OR C14 INCORPORATED INTO MACROMOLECULES OF THE BODY. THE 1962 SUPPLEMENT TO ICRP 2 (1959), DESIGNATED AS ICRP 6 (1962), PUBLISHED BY PERGAMON PRESS (1964), DISCUSSES QUALITY AND DISTRIBUTION OF RADIATION AS IT PASSES THROUGH AND IS ABSORBED BY MATTER. ASSUMING DISTRIBUTION AND QUALITY FACTORS OF 1 FOR THE TRITIATED COMPOUNDS THYMIDINE, WATER, FOLIC ACID AND CORTICOSTEROIDS, INTAKES TO BLOOD WHICH CORRESPOND TO MAX PERMISSIBLE ANNUAL DOSES RECOMMENDED BY ICRP ARE ABOUT 2000, 50, 20, 20 MCI RESPECTIVELY AND ABOUT 200, 2, 2 FOR THE RESPECTIVE COMPOUNDS LABELED WITH C14, SINCE THE MEAN BETA ENERGY FROM C14 IS 54 INSTEAD OF 5.7 KEV. SEE ALSO NSIC NOS. 62623, 49588, 49587, 64772, 64730, 64784, 67137.

CARBON + CODES AND STANDARDS + OXIDE + UNITED KINGDOM + MPD + DOSE CALCULATION, INTERNAL + ICRP + PERSONNEL EXPOSURE, RADIATION + *CORRELATION + REVIEW + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + MAMMAL, RAT + MAN + *RBE + ORGANIC + STEROID + THYMIDINE

067165
SEREBRYAKOV NG + CHIRKOVA EN
TISSUE DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE TO RABBITS
AEC-TR-7303 +. 6 PAGES, 1 FIGURE, 3 TABLES, 15 REFERENCES, RADIOBIOLOGIYA, VOL. 11, PP. 438-443 (1972) (T7780)

AUTHORS BELIEVE HAZARD OF TRITIUM LOCALIZED IN DRY PHASE OF TISSUE IS GREATER THAN THAT DISPERSED THROUGHOUT THE WATER PHASE OF THE BODY. THE RATIO OF TOTAL ABSORBED DOSE FOR DRY COMPONENTS OF WHOLE ORGAN TO THAT FOR THE WHOLE ORGAN IS HIGHEST FOR BONE MARROW (16.90) AND ADRENALS (2.40),

067165 *CONTINUED*
LIVER, SKELETAL MUSCLES, KIDNEYS, HEART MUSCLE, BLOOD, BRAIN AORTA BEING RESPECTIVELY 1.30, 0.98, 0.73, 0.63, 0.55, 0.51, 0.44. THE 59-DAY DOSES IN PRECEDING ORDER WERE CALCD TO BE FOR THE DRY COMPONENT (RESIDUE) OF ORGAN 4145, 3.7, 612, 4770, 62, 26, 461, 52, 1.7 RADS RESPECTIVELY. THE ADDNL DOSES 3 MONTHS AFTER CESSATION OF THE DAILY I.M. INJECTION OF 5 UCI/GM (HTO) BEING RESPECTIVELY 3600, 2.5, 249, 3802, 34, 14, 481, 36, 2.8. RADS/DAY WERE CALCD BY THE FORMULA A (1 - E (EXP -BT)) WITH A VALUES OF 5.54, 10.88, 10.68, 10.52, 10.66, 11.20, 11.62, 10.90, 10.82 AND B VALUES OF 0.256, 0.154, C.161, 0.161, 0.169, 0.164, 0.159, 0.159, 0.159 RESPECTIVELY FOR ABOVE ORGANS IN ABOVE ORDER. THE % WATER (CF LAZARIS, BYUL EKSPERIM BIOL I MED 62,41(1966)) FOR THESE RESPECTIVELY ORGANS IS 32.8, 72.3, 75.5, 76.6, 80.4, 81.1, 83.2, 79.5, 79.0 AND CORRESPONDING % DRY RESIDUES THE DIFFERENCE FROM 100, FOR 3 KG MALE CHINCHILLA RABBITS (26 ANIMALS USED IN EXPT). CF CHIRKOVA, RADIOBIOLOGIYA 11,431(1971). MARROW 4% OF BODY WT, ADRENALS 0.012, LIVER 3.2, SKEL MUSCLES 42.0, ETC.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

OXIDE + HAZARD, RELATIVE + *WATER + *DOSE CALCULATION, INTERNAL + CRITICAL MASS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + DISTRIBUTION + BLOOD + MAMMAL, SMALL + BONE, MARROW + EXPONENTIAL FUNCTION + EXPOSURE, CHRONIC + EXPOSURE, IM + KIDNEY + LIVER + MATURE + MUSCLE + RBE + *DRY + MALE + *MASS + *ORGAN + *RETENTION FUNCTION + ADRENAL + BRAIN + MONTH

067941
MYERS DS + TINNEY JF + GUDIKSEN PH
HEALTH PHYSICS ASPECTS OF LRL TRITIUM RELEASE
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
UCRL-73310 +. 16 PAGES, JULY 16, 1971

ON AUGUST 6, 1970, 289,000 CI OF TRITIUM GAS WAS ACCIDENTALLY RELEASED THROUGH AN EXHAUST STACK AT THE LAWRENCE RADIATION LABORATORY, IN LIVERMORE, CALIFORNIA. SOON AFTER THE RELEASE, EMERGENCY-RESPONSE PERSONNEL SURVEYED THE SITE WITH PORTABLE TRITIUM AIR MONITORS AND AN EXTENSIVE ENVIRONMENTAL SAMPLING WAS STARTED. THE RESULTS FROM THE SAMPLING PROGRAM INDICATE THAT NO SIGNIFICANT EXPOSURE TO ON- OR OFF-SITE INDIVIDUALS RESULTED FROM THE RELEASE. ALL ENVIRONMENTAL SAMPLES OF WATER, MILK, AND URINE CONTAINED NORMAL BACKGROUND LEVELS OF TRITIUM.

AVAILABILITY - D.S. MYERS, LAWRENCE RADIATION LABORATORY, LIVERMORE, CALIFORNIA

EFFLUENT + *ACCIDENT, MONITOR + *SAMPLING + STACK + ACCIDENT, RADIOISOTOPE + *MONITOR, ENVIRONMENTAL + DOSE CALCULATION, EXTERNAL + *RADIOACTIVITY RELEASE + *CONCENTRATION

067964
MARTIN JR + KORANDA JJ
IMPORTANCE OF TRITIUM IN THE CIVIL DEFENSE CONTEXT
CALIFORNIA UNIVERSITY, LIVERMORE, LAWRENCE RADIATION LABORATORY
UCRL-73085 +. 15 PAGES, MARCH 8, 1971

THE IMPORTANCE OF TRITIUM IN THE CIVIL DEFENSE CONTEXT IS ASSESSED BY COMPARING THE DOSE RATE AND 30-YEAR DOSE INTEGRAL FOR TRITIUM FROM FUSION WITH THE EXTERNAL DOSE OF GAMMA-EMITTING FISSION PRODUCTS. TRITIUM IS SHOWN TO BE RELATIVELY UNIMPORTANT IN THE CIVIL-DEFENSE CONTEXT WHEN COMPARED WITH THE EXTERNAL GAMMA DOSE FROM AN EQUAL YIELD OF FISSION PRODUCTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FISSION PRODUCT RELEASE + *CIVIL DEFENSE + DOSE CALCULATION, EXTERNAL + GAMMA EMITTER + *SAFETY EVALUATION + *COMPARISON

070395
COHEN JJ + HIGGINS GH
SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT
LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-73182 + CONF-710809-14 +. 22 PAGES, FROM THE TRITIUM SYMPOSIUM LAS VEGAS, NEVADA, AUGUST 30, 1971

IN ACCORDANCE WITH CURRENT GUIDANCE, TRITIUM RELEASES MUST BE KEPT BELOW QUANTITIES WHERE MPC LEVELS ARE EXCEEDED, AND SHOULD BE KEPT AS LOW AS PRACTICABLE. DETERMINATION OF PRACTICABILITY REQUIRES AN ANALYSIS OF BENEFIT VERSUS RISK CONSIDERATIONS. SUCH AN ANALYSIS HAS BEEN PERFORMED FOR CERTAIN GENERAL CASES. IT IS BASED ON A MER VALUE OF $250 (A MER IS THE AMOUNT OF BENEFIT REQUIRED TO JUSTIFY A RADIATION EXPOSURE OF ONE MAN-REM) AND CONSIDERS THE NATURE OF TRITIUM DISTRIBUTION IN THE BIOSPHERE AS WELL AS CERTAIN DEMOGRAPHIC FACTORS. IT ALSO ASSUMES THAT CONSTRAINTS IMPOSED BY EXPOSURE GUIDES ARE OBSERVED. THE ASSUMPTIONS AND CALCULATIONS ARE REVIEWED IN DETAIL. THE POSSIBLE SOCIAL AND MORAL IMPLICATIONS OF SUCH AN ANALYSIS ARE ALSO DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MPC + RADIATION IN PERSPECTIVE + RADIOACTIVITY RELEASE + ENVIRONMENT + RADIATION EXPOSURE + BENEFIT VS RISK + SOCIO/PHILOSOPHICAL CONSIDERATION

070396
ANSPAUGH LR + KORANDA JJ + ROBISON WL + MARTIN JR
DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR

070396 *CONTINUED*
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY, LIVERMORE
UCRL-73195 + CONF-71809-12 +. 31 PAGES, FROM THE TRITIUM SYMPOSIUM HELD IN LAS VEGAS, NEVADA, AUGUST 30, 1971

PAST EFFORTS TO PREDICT THE DOSE TO MAN AS A RESULT OF POSSIBLE FOOD-CHAIN CONTAMINATION FOLLOWING THE RELEASE OF THO VAPOR HAVE BEEN BASED UPON MODELS MORE APPROPRIATE FOR THE RELEASE OF RADIONUCLIDES WHICH DIFFER SUBSTANTIALLY FROM THO IN THE DYNAMICS AND PATHWAYS OF ECOLOGICAL TRANSPORT. FIELD STUDIES IN CONJUNCTION WITH PROJECT RULISON AND CONTROLLED EXPOSURE EXPERIMENTS INDICATE THAT SUCH MODELS OVERPREDICT THE DOSE TO MAN BY ORDERS OF MAGNITUDE. DATA FROM THESE AND OTHER PERTINENT EXPERIMENTS ARE USED TO DERIVE A MORE REALISTIC, SIMPLE MODEL WHICH MAY BE USED TO PREDICT THE DOSE TO MAN VIA INHALATION PLUS ABSORPTION AND VIA THE INGESTION OF VEGETABLES, MILK, AND MEAT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECOLOGY + DOSE + INGESTION + INHALATION + *MILK + CRITICAL NUCLIDE + *CRITICAL NUCLIDE PATHWAY + *WATER VAPOR + ABSORPTION + MODEL + CONCENTRATION + *FOOD CHAIN + *RADIATION EXPOSURE, ACUTE + *RADIATION EXPOSURE, CHRONIC + FOOD

070413
MOEHRLE G + SCHIEFERDECKER H
INCORPORATION HAZARDS AND THEIR ESTIMATION
KERNFORSCHUNGZENTRUM, KARLSRUHE, GERMANY
5 PAGES, RADIOLOGE, 10(9), PP. 381-385 (SEPTEMBER 1970) (IN GERMAN)

THE INCORPORATION OF RADIOACTIVE MATERIAL IS DISCUSSED WITH RESPECT TO HAZARD. THE SURVEY CONSIDERS THE EFFECTIVE HALF-LIFE OF INCORPORATED RADIONUCLIDES AND WAYS OF INCORPORATION AND DISTRIBUTION IN THE BODY. DELINEATED IS DETERMINATION OF THE INCORPORATED RADIOACTIVITY BY WHOLE-BODY COUNTING AND BY EXCRETION ANALYSIS. IT WAS CONCLUDED THAT INTERVALS BETWEEN EXAMINATION OF PERSONNEL SHOULD NOT EXCEED THE EFFECTIVE HALF-LIFE OF THE RADIONUCLIDE UNDER CONSIDERATION. MEASUREMENTS OF INCORPORATION SHOULD BE PERFORMED WEEKLY FOR TRITIUM AND CO-60, MONTHLY FOR URANIUM, AND FOUR TIMES A YEAR FOR PLUTONIUM.

COBALT + COUNTER + *DEPOSITION + DOSE + PLUTONIUM + HAZARD, RELATIVE + URANIUM + *ANALYTICAL TECHNIQUE + CONTAMINATION + *DOSE MEASUREMENT, INTERNAL + *RADIOISOTOPE + SAFETY EVALUATION + BIOLOGICAL HALF-LIFE + *EXCRETION + *WHOLE BODY

070544
MOGHISSI AA + LIEBERMAN R
COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER
WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS + EASTERN ENVIRONMENTAL RADIATION LABORATORY, MONTGOMERY
3 PAGES, 1 FIGURE, 1 TABLE, 7 REFERENCES, HEALTH PHYSICS, VOL. 22, PP. 509-522 (MAY 1972)

CONSERVATIVE DOSE ESTIMATES TO THE POPULATION ARE OBTAINED BY THE ASSUMPTION THAT THE CONCENTRATION IN BODY WATER IS EQUAL TO THAT IN DRINKING WATER. THIS IS SHOWN BY STUDY OF RESIDENTS DOWNSTREAM FROM THE SAVANNAH RIVER NUCLEAR PLANT FOR WHOM TRITIUM IN URINE WAS 1-8 NCI/LITER, AVERAGING 0.4 OF THAT IN TAP WATER.

*DOSE CALCULATION, INTERNAL + WATER, DRINKING + RIVER, SAVANNAH + ENVIRONMENT + BIOACCUMULATION/TURNOVER + FOOD CHAIN + FIELD EXPERIMENT + CONCENTRATION FACTOR + EXCRETION, URINE + *MAN + BODY FLUID

071194
MOGHISSI AA + LIEBERMAN R
COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER
WESTERN ENVIRONMENTAL RESEARCH LABORATORY + EASTERN ENVIRONMENTAL RADIATION LABORATORY
3 PAGES, 1 FIGURE, 1 TABLE, 7 REFERENCES, HEALTH PHYSICS, 22(5), PP. 509-511 (MAY 1972)

BASED ON LIMITED STUDY, IT IS CONCLUDED THAT THE TECHNIQUE OF ESTIMATING DOSE TO THE POPULATION USING THE ASSUMPTION THAT THE CONCENTRATION OF TRITIUM IN BODY WATER IS EQUAL TO THAT IN DRINKING WATER IS CONSERVATIVE FOR THE PROTECTION OF PUBLIC HEALTH, UNLESS SOURCES OF TRITIUM INTAKE OTHER THAN DRINKING WATER ARE SIGNIFICANT.

*WATER, DRINKING + *POPULATION EXPOSURE + DOSE MEASUREMENT, EXTERNAL + DOSE MEASUREMENT, INTERNAL + CONCENTRATION + *COMPARISON + EXCRETION, URINE + *BODY FLUID

071195
FITZSIMMONS CK + MCNELIS ON + WRUBLE DT
TRITIUM ACTIVITY IN URINE FROM LUMINOUS DIAL WRIST WATCHES
WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS, NEVADA
3 PAGES, 1 FIGURE, 2 TABLES, 3 REFERENCES, HEALTH PHYSICS, 22(5), PP. 514-516 (MAY 1972)

STUDIES AT THE WESTERN ENVIRONMENTAL RESEARCH LABORATORY HAVE SHOWN THAT TRITIUM IN VARIOUS CHEMICAL FORMS IS RELEASED FROM TRITIUM ACTIVATED LUMINOUS COMPOUNDS. IT WAS SPECULATED, THEREFORE, THAT TRITIUM LUMINOUS WATCHES MIGHT BE RESPONSIBLE FOR THE ELEVATED TRITIUM BODY BURDENS OF SOME OF THE RESIDENTS. EXPERIMENTS ARE DESCRIBED AND DATA GIVEN WHICH SUPPORT THIS SPECULATION.

*RADIUM + PERSONNEL EXPOSURE, RADIATION + RADIOACTIVITY RELEASE + *LUMINARY + *BODY BURDEN

071505
BENNETT BG
RADIATION DOSE DUE TO ACUTE INTAKE OF TRITIUM BY MAN
AEC, HEALTH AND SAFETY LABORATORY, NEW YORK OPERATIONS OFFICE
HASL-253 +. 17 PAGES, APRIL 1972

SMALL AMOUNTS OF TRITIUM ACQUIRED AS WATER BY MAN ARE INCORPORATED INTO TISSUE COMPOUNDS AND RETAINED CONSIDERABLY LONGER THAN THE 8-TO-10-DAY HALF-TIME ASSOCIATED WITH RETENTION IN THE BODY WATER. A REVIEW OF THE DATA FROM THE FEW LONG-TERM OBSERVATIONS OF HUMAN CASES OF EXPOSURE TO TRITIUM SHOWS THAT TWO BOUND COMPONENTS WITH RETENTION HALF-TIMES OF ABOUT 30 AND 450 DAYS CAN BE IDENTIFIED. A TWO-COMPARTMENT ESTIMATE AND THREE-COMPARTMENT-MODEL CALCULATIONS ARE MADE TO DETERMINE THE CONTRIBUTION TO THE TISSUE DOSE FROM TRITIUM IN THE BODY WATER AND IN THE BOUND COMPARTMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + *WATER + *DOSE CALCULATION, INTERNAL + MODEL + *BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + *HALF-LIFE, EFFECTIVE + EFFECT, AGE + *EXPOSURE, ACUTE + MAN + *RETENTION + BODY FLUID

072215
HOFER KG + HUGHES WL
RADIOTOXICITY OF INTRANUCLEAR TRITIUM, 125-IODINE AND 131-IODINE
THE OHIO STATE UNIVERSITY, COLUMBUS + TUFTS UNIVERSITY SCHOOL OF MEDICINE, BOSTON, MASSACHUSETTS
16 PAGES, 4 FIGURES, 26 REFERENCES, RADIATION RESEARCH, VOL. 47, PP. 94-109 (JULY 1971)

L1210 LEUKEMIA CELLS WERE LABELED WITH VARIOUS DOSES OF 125I-IODODEOXYURIDINE, 131I-IODODEOXYURIDINE, OR 3H-THYMIDINE AND INOCULATED INTO NEW, NONRADIOACTIVE HOSTS TO FACILITATE A QUANTITATIVE EVALUATION OF THE TOXIC EFFECTS RESULTING FROM THE INTRANUCLEAR DECAY OF THE THREE RADIOISOTOPES. INTRACELLULAR TRITIUM AND 131I PRODUCT ALMOST IDENTICAL EFFECTS. THE TWO RADIOISOTOPES, BOTH BETA EMITTERS, YIELD SURVIVAL CURVES WHICH ARE CHARACTERISTIC OF LOW-LET RADIATIONS. IN TERMS OF ENERGY ABSORPTION PER CELL, THE TOXIC MANIFESTATIONS FROM 125I EXCEED THE EFFECTS OF TRITIUM AND 131I BY A FACTOR OF 4 TO 5. IN SPITE OF A NARROW SHOULDER RESPONSE, THE 125I SURVIVAL CURVE RESEMBLES THE PATTERN OBSERVED WITH HIGH LET RADIATION.

*BIOMEDICAL + *IODINE + *RADIOBIOLOGY + RADIOSENSITIVITY + TOXICITY

072960
COHEN JJ + HIGGINS GH
SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT
UNIVERSITY OF CALIFORNIA, LAWRENCE RADIATION LABORATORY
UCRL-73182 (REV. 1) + CONF-710809-15 +. 19 PAGES, FROM THE TRITIUM SYMPOSIUM, LAS VEGAS, NEVADA, AUGUST 30, 1971

IN ACCORDANCE WITH CURRENT GUIDANCE, TRITIUM RELEASES MUST BE KEPT BELOW QUANTITIES WHERE MPC LEVELS ARE EXCEEDED, AND SHOULD BE KEPT AS LOW AS PRACTICABLE. DETERMINATION OF PRACTICABILITY REQUIRES AN ANALYSIS OF BENEFIT-VERSUS-RISK CONSIDERATIONS. SUCH AN ANALYSIS WAS PERFORMED FOR CERTAIN GENERAL CASES. IT IS BASED ON A MER VALUE OF $250 (A MER IS THE AMOUNT OF BENEFIT REQUIRED TO JUSTIFY A RADIATION EXPOSURE OF ONE MAN-REM) AND CONSIDERS THE NATURE OF TRITIUM DISTRIBUTION IN THE BIOSPHERE AS WELL AS CERTAIN DEMOGRAPHIC FACTORS. IT ALSO ASSUMES THAT CONSTRAINTS IMPOSED BY EXPOSURE GUIDES ARE OBSERVED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GUIDE + KRYPTON + MPC + *REGULATION + *HAZARDS ANALYSIS + *RADIOACTIVITY RELEASE + DISTRIBUTION + *BENEFIT VS RISK + *SOCIO/PHILOSOPHICAL CONSIDERATION

075281
MOSKALEV YI
TRITIUM OXIDE
AEC-TR-7298 +. 363 PAGES, FIGURES, TABLES, REFERENCES, 1968

A MONOGRAPH GENERALIZING EXTENSIVE THEORETICAL AND EXPERIMENTAL MATERIAL ON THE DISTRIBUTION, KINETICS OF EXCHANGE, AND BIOLOGICAL ACTION OF TRITIUM OXIDE. THE MODERN DATA ON THE PHYSICAL PROPERTIES OF DEUTERIUM AND TRITIUM, THE ISOTOPIC EXCHANGE OF HYDROGEN, THE KINETICS OF ISOTOPIC EXCHANGE, METHODS FOR MEASURING TRITIUM IN BIOLOGICAL MEDIA, THE KINETICS OF WATER EXCHANGE IN THE ANIMAL AND HUMAN ORGANISM, PATHWAYS AND RATES OF ASSIMILATION OF TRITIUM OXIDE THROUGH THE GASTROINTESTINAL TRACT, LUNGS, AND SKIN, AND THE KINETICS OF THE ELIMINATION OF TRITIUM OXIDE FROM THE ANIMAL AND HUMAN ORGANISM ARE ANALYZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIOMEDICAL + DEUTERIUM + HYDROGEN + MEASUREMENT + *OXIDE + *CRITICAL NUCLIDE PATHWAY + ION EXCHANGE + *PROPERTY, PHYSICAL + ANIMAL + ASSIMILATION + *DISTRIBUTION + ELIMINATION + GI TRACT + LUNG + MAN + SKIN + *BIOLOGICAL CONTROL + *METABOLIC KINETICS

075523
BUSH WP
ASSESSING AND CONTROLLING THE HAZARD FROM TRITIATED WATER

075523 *CONTINUED*
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER NUCLEAR LABORATORIES, ONTARIO
AECL-4150 +. 106 PAGES, FIGURES, TABLES, REFERENCES, APRIL 1972

PRACTICAL AND THEORETICAL INFORMATION IS PRESENTED TO HELP RADIATION SURVEYORS AND OPERATORS OF HEAVY-WATER REACTORS AND UPGRADING PLANTS TO UNDERSTAND, ASSESS AND CONTROL THE RADIATION HAZARD FROM TRITIATED WATER (HTO OR DTO). THE INTAKE OF HTO THROUGH THE SKIN AND LUNGS, ITS EXCRETION AND THE ASSOCIATED RADIATION DOSE ARE DISCUSSED, AND CONCEPTS SUCH AS CRITICAL ORGAN, DOSE COMMITMENT, MAXIMUM PERMISSIBLE CONCENTRATION IN AIR (MPC)A AND (MPC)A-HOUR ARE EXPLAINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + INHALATION + MPC + *PERSONNEL PROTECTIVE DEVICE + *REACTOR, POWER + PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + *ABSORPTION + EXCRETION + LUNG + *MAN + SKIN

075576
SHEETS JGPM + BERLIN A + AMAVIS RJ
SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT
COMMISSION OF THE EUROPEAN COMMUNITIES, LUXEMBOURG (BELGIUM)
12 PAGES, 1 TABLE, NUCLEAR SAFETY, 13(5), PP. 380-391 (SEPTEMBER/OCTOBER 1972)

THE SYMPOSIA PAPERS (SEPARATE ABSTRACTS APPEAR IN NSIC ABSTRACTS FOR MOST) ARE LISTED AND CHARACTERIZED BRIEFLY. SOME OF THE QUESTIONS RAISED AT A 2.5-HOUR PANEL DISCUSSION ARE PRESENTED - EFFECTS FROM TRITIUM PRODUCED BY FAST REACTORS, ACCOUNTING FOR PARAMETERS WHICH AFFECT RADIONUCLIDE UPTAKE, THE TERM 'LIMITING RADIOLOGICAL CAPACITY' INCLUDES NO SAFETY FACTORS, THE TERM 'CRITICAL POPULATION' DOES NOT ACCOUNT FOR MULTIPLE SOURCES AND EFFECTS FROM OTHER POLLUTANTS, AND EXTENSION OF THE EURATOM TREATY TO NONRADIOACTIVE POLLUTANTS. ANSWERS TO MANY OF THESE QUESTIONS REQUIRE FURTHER WORK IN 'RADIOLOGICAL FORECASTING' FOR A HYDROLOGICAL BASIN, ALSO IN ANALYSIS OF HAZARDS IN CONNECTION WITH BOTH RADIOACTIVE WASTE DISPOSAL AND ENVIRONMENTAL CONTAMINATION BY TRITIUM AND THE NOBLE-GAS RADIONUCLIDES.

ECOLOGY + EURATOM + NOBLE GAS + ATMOSPHERIC POLLUTION + WASTE DISPOSAL + *CRITICAL NUCLIDE PATHWAY + *ENVIRONMENT + WATER POLLUTION + FORECAST + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + *FOOD CHAIN + POLLUTION + ECOSYSTEM, MARINE + ECOSYSTEM, MODEL + SYSTEM ANALYSIS + MODEL, DETERMINISTIC + ECOSYSTEM, ESTUARINE + ORGANIZATION, INTERNATIONAL

075915
COMBET M + GERARD R
RADIOLOGICAL RISKS RELATIVE TO THE DISTRIBUTION OF CONTAMINATED GAS
UNIVERSITY OF CALIFORNIA, LIVERMORE
UCRL-TRANS 10617-2 +. 15 PAGES, 1 TABLE, 5 REFERENCES, MAY 1971

EVALUATED THE AVERAGE AND MAXIMUM DOSES LIKELY TO REACH CONSUMERS WHO, FOR ALL THEIR USUAL REQUIREMENTS, USE A STORED GAS SLIGHTLY CONTAMINATED BY REMAINING IN A NUCLEAR CAVITY. ALTHOUGH THE INVESTIGATION WAS CARRIED OUT IN THE CONTEXT OF A WELL-DEFINED PROJECT IN AN ATTEMPT TO OBTAIN REALISTIC VALUES, IT IS FULLY APPLICABLE TO ALL SIMILAR CASES OF STORAGE OR STIMULATION, LEADING TO MODIFICATION OF THE RESULTS IN THE SAME WAY AS THE MODIFICATION OF THE STARTING PREMISES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAINMENT, UNDERGROUND + *KRYPTON + *PLOWSHARE + *NUCLEAR DETONATION + *CONTAMINATION + *GAS + *CONSUMER PRODUCT + CONCENTRATION + *BENEFICIAL USE, AGRICULTURE + *BENEFICIAL USE, COMMERCIAL + RESOURCE, NATURAL + BENEFIT VS RISK

076703
MOGHISSI AA + CARTER MW + BRETTHAUER EW
FURTHER STUDIES ON THE LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM
WESTERN ENVIRONMENTAL RESEARCH LABORATORY
2 PAGES, 2 TABLES, 2 FIGURES, 2 REFERENCES, HEALTH PHYSICS, 23(6), PP. 805-806 (DECEMBER 1972)

IN A PREVIOUSLY PUBLISHED STUDY IT WAS REPORTED THAT THE ELIMINATIONS OF TRITIUM FROM TWO HUMAN SUBJECTS FOLLOWED A MULTI-COMPONENT CURVE. ADDITIONAL DATA HAVE BEEN COLLECTED ON ONE OF THE SUBJECTS WHO EXHIBITED A LONG HALF-LIFE COMPONENT OF 2020 DAYS WHICH REVISE THAT ESTIMATE TO 550 DAYS. ANOTHER SUBJECT WHO RECEIVED AN INDUSTRIAL EXPOSURE WAS STUDIED, AND THE RESULTS INDICATE A LONG HALF-LIFE OF 350 DAYS FOR THIS SUBJECT. A POSSIBLE SEASONAL VARIATION IN TRITIUM EXCRETION NOTED IN THE PREVIOUS REPORT WAS CONFIRMED BY THE ADDITIONAL DATA REPORTED HEREIN.

*FISSION PRODUCT RETENTION + *BIOLOGICAL HALF-LIFE + EXCRETION + *HALF-LIFE, EFFECTIVE + PERIODICITY, SEASONAL + MAN + *BIOLOGICAL CONTROL

077017
IONIZING RADIATION, VOL. 1: LEVELS (HPIS/98)
UNITED NATIONS SCIENTIFIC COMMITTEE
197 PAGES, FIGURES, TABLES, REFERENCES, 1972

FOR THE NON-SPECIALIST DESIRING AN AUTHORITATIVE REVIEW OF NATURAL AND MANMADE BACKGROUND LEVELS OF RADIATION AND RESULTING DOSES TO MAN AND HIS TISSUES. OVER 900 REFS GIVE ENTRY TO THE TYPE LITERATURE IN QUESTION. FOR RADIATION EFFECTS, ESP GENETIC, SEE VOL 2 (HPEI/00019). FOR SOMATIC

077017 *CONTINUED*

EFFECTS, HPEI/00C18. ANNUAL 19 MRADS FOR K-40, 0.7 FOR C-14, 0.3 FOR RB-87 AND 0.001 FOR H-3 FOR A TOTAL OF 20 MRADS PER YR, MARROW IN TRABECULAR BONE GETTING ABOUT SAME DOSES. ADDNL DOSES 0.6 MRAD/YR FOR PO-210, 0.07 FOR RN-222, 0.03 FOR RA-228, 0.03 FOR U-238, 0.02 FOR RA-22, 0.003 FOR RN-220. FOR EXTERNAL IRRACIATION THE DOSE RATE IN MRADS/YR TO GONADS IS 28 FOR THE IONIZING COMPONENT OF COSMIC RAYS AND 0.35 FOR THE NEUTRON COMPONENT. TOTAL INTERNAL + EXTERNAL DOSE RATES FROM NATURAL SOURCES IN SO-CALLED NORMAL AREAS IS ABOUT 93 MRADS/YR TO GONADS, AND ABOUT THE SAME FOR BONE MARROW. DIETARY INTAKE OF PB-210 IS ABOUT 17 PCI/CAY FOR JAPAN, 9 FOR FINLAND, 5 FOR GERMANY, 4 FOR USSR, 1 TO 10 FOR UK, 2 FOR USA. SEE ORIGINAL FOR ADDNL DATA, INCLUDING STAFF DOSES VS ELECTRICAL OUTPUT FOR POWER REACTORS.

AVAILABILITY - UNITED NATIONS, SALES SECTION, NEW YORK, NEW YORK (SALES NO. E.72.IX.17)

*BIOMEDICAL + CARBON + CESIUM + DOSIMETRY + *EFFLUENT + KRYPTON + PLUTONIUM + STRONTIUM + ATMOSPHERIC POLLUTION + URANIUM + *REACTOR, POWER + DIETARY HABIT + IRON + POPULATION EXPOSURE + COSMIC RADIATION + CONTAMINATION + *RADIOACTIVITY RELEASE + ENVIRONMENT + *X-RAY + WATER POLLUTION + *FUEL REPROCESSING + FOOD CHAIN + *EFFECT, GENETIC + *DOSIMETRY, CLINICAL + *THERAPY + *RADIATION EFFECT + RADIATION EXPOSURE + BONE + CARCINOGEN + MAN + TESTIS + INDUSTRY, NUCLEAR + BIOLOGICAL CONTROL + *EXPOSURE, BACKGROUND + RADIOPHARMACEUTICAL + HPIS

077143

ROHWER PS + KELLY MJ

RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL GAS

OAK RIDGE NATIONAL LABORATORY, TENNESSEE

PAPER NO. 36 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (SEE CONF-730603--)

TRITIUM AND KRYPTON-85 ARE THE PREDOMINANT RESIDUAL MAN-MADE RADIONUCLIDES PRESENT IN NATURAL GAS PRODUCED FROM NUCLEARLY STIMULATED WELLS. SIMPLE COMPARISON OF CONCENTRATIONS OF THESE RADIONUCLIDES DOES NOT PROVIDE A GOOD INDICATION OF THE RELATIVE RADIOLOGICAL IMPORTANCE EVEN THOUGH A COMPARISON OF THEIR MPC'S(H-3, 0.2 PCI/CM-3; KR-85, 0.3 PCI/CM-3) SUGGESTS THAT EQUAL CONCENTRATIONS OF TRITIUM AND KRYPTON-85 ARE OF NEARLY EQUAL RADIOLOGICAL SIGNIFICANCE. IN DISCUSSING THE FALLACY OF USING CONCENTRATIONS OR MPC'S TO MAKE THIS PARTICULAR COMPARISON, DETAILED CONSIDERATION IS GIVEN TO EACH RADIONUCLIDE TO EMPHASIZE DIFFERENCES IN TYPE OF RADIATION EMISSION, PHYSICAL AND CHEMICAL FORM, UPTAKE BY MAN, AND REFERENCE TISSUE.

AVAILABILITY - P.S. ROHWER, ENVIRONMENTAL SCIENCES DIVISION, OAK RIDGE NATIONAL LABORATORY, P.O. BOX Y, OAK RIDGE, TENNESSEE 37830

*KRYPTON + MPC + *POPULATION EXPOSURE + *CONTAMINATION + RADIOLOGICAL ASSISTANCE + *GAS + CONCENTRATION + *EFFECT, GENETIC + *COMPARISON + *EFFECT, SOMATIC + STIMULATION + *RESOURCE, NATURAL + PHYSICOCHEMICAL FORM + HPIS

077191

MOGHISSI AA + CARTER MW

TRITIUM

807 PAGES, PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

'TRITIUM' IS BASED ON A SYMPOSIUM HELD FROM AUGUST 30 THROUGH SEPTEMBER 2, 1971, IN LAS VEGAS, NEVADA, AND COSPONSORED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND THE UNIVERSITY OF NEVADA, LAS VEGAS. THE ORGANIZERS ATTEMPTED TO COVER THE ENTIRE SUBJECT, ALTHOUGH PRIMARY EMPHASIS WAS PLACED ON THE ENVIRONMENTAL ASPECTS OF TRITIUM. THE BOOK IS DIVIDED INTO TEN CHAPTERS COVERING THE HISTORY, PRODUCTION, MEASUREMENT, BIOLOGICAL EFFECTS AND KINETICS, ENVIRONMENTAL ASPECTS, APPLICATION AND HEALTH PHYSICS OF TRITIUM.

CONTAINMENT + EFFLUENT + MEASUREMENT + *PLOWSHARE + HAZARD, RELATIVE + *WASTE TREATMENT + *TEST, WEAPONS + *REACTOR, POWER + MONITOR, ENVIRONMENTAL + *NUCLEAR DETONATION + RADIOACTIVITY RELEASE + ENVIRONMENT + DATA COLLECTION + *PRODUCTION + RADIATION EFFECT + BIOLOGICAL CONTROL + *SOCIO/PHILOSOPHICAL CONSIDERATION + HPIS

077199

GAGNON WF + APPLEBY A

CHEMICAL AND BIOLOGICAL EFFECTS OF TRITIUM

RUTGERS UNIVERSITY, NEW JERSEY

96 PAGES, PP. 192-288 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

PRESENTS AND IS CONCERNED WITH TOPICS SUCH AS THE RADIATION CHEMISTRY OF WATER, SOMATIC AND TERATOGENIC EFFECTS, BIOLOGICAL EFFECTS, TRANSMUTATION AND TRITIUM DECAY, QUALITY FACTOR FOR TRITIUM RADIATION, RELATIVE BIOLOGICAL EFFECTIVENESS, TRITIUM OXIDE TRANSFER, TUMOR INCIDENCE, CHROMOSOMAL CHANGES, AND TRITIUM IN HAIR.

DECAY HEAT + OXIDE + *WATER + BETA EMITTER + MILK + INCIDENT, FATALITY + QUALITY ASSURANCE + PROPERTY, CHEMICAL + CHROMOSOMAL EFFECT + *EFFECT, GENETIC + *EFFECT, SOMATIC + *RADIATION EFFECT + *RADIATION EXPOSURE + EFFECT, DOSE RATE + FETUS + HAIR + LINEAR ENERGY TRANSFER + PLACENTA + RBE + TUMOR + BIOLOGICAL CONTROL + *PATHOLOGY + *EFFECT, DOSE + HPIS

077309

DIETHORN WS + STOCKHO WL

THE DOSE TO MAN FROM ATMOSPHERIC KR-85

THE PENNSYLVANIA STATE UNIVERSITY

077309 *CONTINUED*
10 PAGES, 3 TABLES, 4 FIGURES, 26 REFERENCES, HEALTH PHYSICS, 23(5), PP. 653-662 (NOV. 1972)

THE CONTRIBUTION OF ATMOSPHERIC KR-85 TO MAN'S DOSE BURDEN IS REEXAMINED. EARLIER WORK IS UPDATED AND THE MAJOR DIMENSIONS OF THE PROBLEM DISUCSSED. TODAY, THE DOSE RANGES FROM A BARE SKIN DOSE OF APPROXIMATELY 0.001 MRAD/YR TO A WHOLE BODY DOSE OF APPROXIMATELY 0.0001 MRAD/YEAR. THE SKIN DOSE IS COMPARABLE TO THE WHOLE BODY DOSE FROM NATURAL H-3. IF THE WORLD-WIDE PRACTICE OF DUMPING KR-85 INTO THE ATMOSPHERE IS NOT CURTAILED, THESE DOSES WILL INCREASE BY A FACTOR OF 30 IN THE NEXT DECADE OR TWO.

*DOSE + *KRYPTON + OCEAN AND SEA + *ATMOSPHERIC POLLUTION + DOSE CALCULATION, INTERNAL + DOSE MEASUREMENT, EXTERNAL + DOSE CALCULATION, EXTERNAL + DOSE MEASUREMENT, INTERNAL + GAMMA + *SAFETY EVALUATION + EQUILIBRIUM + COMPARISON + *POLLUTION IN PERSPECTIVE + SKIN + *WHOLE BODY

077833
CROACH JW
THEORETICAL RADIATION DOSE TO THE HUMAN SYSTEM FROM ASSIMILATED TRITIUM
I.E. DU PONT DE NEMOURS & COMPANY
6 PAGES, 2 TABLES, 2 FIGURES, 7 REFERENCES, HEALTH PHYSICS, 24(1), PP. 17-22 (JANUARY 1973)

A THEORETICAL MODEL FOR TRITIUM BEHAVIOR IN MAN SHOWS THAT, FOR TRITIUM UPTAKE, THE RADIATION ENERGY DEPOSITION PER UNIT WEIGHT OF BODY HYDROGEN IS ESSENTIALLY INVARIANT FOR ALL COMPONENTS OF THE HUMAN SYSTEM. THE MODEL IS BASED ON THE ASSUMPTION THAT TRITIUM ENTERS THE BODY IN A MANNER TYPICAL OF HYDROGEN. IF ASSIMILATED TRITIUM BEHAVES THE SAME AS ORDINARY HYDROGEN, THE AMOUNT OF TRITIUM PASSING THROUGH ANY BODY SUBSYSTEM VARIES DIRECTLY WITH THE HYDROGEN TURNOVER RATE, WHILE THE RESIDENCE TIME VARIES INVERSELY WITH TURNOVER RATE. THE SPECIFIC ENERGY DEPOSITION IN ANY SUBSYSTEM IS, THEREFORE, THE SAME AS THAT IN ANY OTHER SUBSYSTEM FOR TRITIUM ASSIMILATED IN A MANNER TYPICAL OF HYDROGEN. PATHWAY EFFECTS ASSOCIATED WITH PREFERENTIAL ENTRY OF TRITIUM IN ATYPICAL HYDROGEN STREAMS CAN BE SIGNIFICANT.

DEPOSITION + *DOSE + HYDROGEN + *CRITICAL NUCLIDE PATHWAY + *MODEL + *BEHAVIOR + *MAN

080838
EISENBUD M
HEALTH HAZARDS FROM RADIOACTIVE EMISSIONS
NEW YORK UNIVERSITY MEDICAL CENTER
23 PAGES, 6 TABLES, PAPER PRESENTED AT THE AMERICAN MEDICAL ASSOCIATION'S CONGRESS ON ENVIRONMENTAL HEALTH, APRIL 29-30, 1973, CHICAGO, ILLINOIS

IT IS CONCLUDED FROM THE OPERATING EXPERIENCE OF CIVILIAN POWER PLANTS THAT NUCLEAR POWER INVOLVES BUT MINIMAL AND INSIGNIFICANT RADIATION EXPOSURE OF THE PUBLIC. FROM THE POINT OF VIEW OF ONE CONCERNED WITH THE PUBLIC HEALTH, NUCLEAR POWER IS A WELCOME ALTERNATIVE TO POWER GENERATED BY COMBUSTION OF FOSSIL FUELS. ENVIRONMENTAL RADIOACTIVITY SHOULD POSE NO LIMITATION ON THE DEVELOPMENT OF NUCLEAR ENERGY IN THE DECADES IMMEDIATELY AHEAD.

AVAILABILITY - DR. MERRIL EISENBUD, NEW YORK UNIVERSITY MEDICAL CENTER, LABORATORY FOR ENVIRONMENTAL STUDIES, INSTITUTE OF ENVIRONMENTAL MEDICINE, NEW YORK, N.Y.

CESIUM + CODES AND STANDARDS + DOSE + EFFLUENT + IODINE + KRYPTON + MPC + *HAZARD, RELATIVE + XENON + *POPULATION EXPOSURE + PERSONNEL EXPOSURE, RADIATION + RADIOACTIVITY RELEASE + WHOLE BODY + *INDUSTRY, NUCLEAR + *POWER PLANT, NUCLEAR + ENVIRONMENTAL PROTECTION AGENCY (EPA)

082305
SCHIEFERDECKER H
TRITIUM HEALTH PHYSICS
KARLSRUHE NUCLEAR RESEARCH CENTER, WEST GERMANY
63 PAGES, PP. 737-800 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

PRESENTS TOPICS SUCH AS RADIOBIOASSAY AT KARLSRUHE NUCLEAR RESEARCH CENTER, CONTROL OF TRITIATED WATER VAPOR, ASSESSMENT OF SOME RADIOLOGICAL HAZARDS FROM TRITIUM, DESORPTION OF TRITIUM FROM TARGET SOURCES, CONTAINMENT OF TRITIUM, LOSS OF TRITIUM FROM COATED CEMENT PASTE BLOCKS, AND DETERMINATION OF TRITIUM LEAK RATES FROM WASTE-PROCESSING EQUIPMENT.

CONCRETE + CONTAINMENT + *HEALTH PHYSICS TRAINING + *MEASUREMENT + SOURCE, RADIATION + TEST, LEAK RATE + *WATER + HAZARDS ANALYSIS + DESORPTION + *MONITOR + *RADIATION SAFETY AND CONTROL + *RADIOLOGICAL ASSISTANCE + WATER VAPOR + CONTAINMENT LEAKAGE CONTROL + KARLSRUHE + LEAK RATE + LEACHING + HPIS

082319
EISENBUD M
FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS
NEW YORK UNIVERSITY MEDICAL CENTER, NEW YORK
37 PAGES, PP. 316-353 OF 'ENVIRONMENTAL RADIOACTIVITY', PUBLISHED BY ACADEMIC PRESS, INC., 1973 (BOOK)

THE USE OF NUCLEAR WEAPONS PRODUCES RADIOACTIVE CONTAMINATION ON A SCALE THAT, WHEN COMPOUNDED WITH THE EFFECTS OF BLAST AND FIRE, WOULD CREATE WARTIME PROBLEMS FOR WHICH AT PRESENT THERE IS NO FORESEEABLE SOLUTION. MOREOVER, AS IS WELL KNOWN, THE PEACETIME TESTING OF NUCLEAR WEAPONS IS CAPABLE OF PRODUCING WORLDWIDE CONTAMINATION AND WAS THE SUBJECT OF INTENSE WORLDWIDE CONCERN BETWEEN 1954 AND THE SIGNING OF A TEST-BAN AGREEMENT IN 1963. THIS CHAPTER DISCUSSES THE SUBJECT OF NUCLEAR AND THERMONUCLEAR EXPLOSIONS IN GENERAL AND THEN REVIEWS THE PRINCIPAL RADIOLOGICAL

082319 *CONTINUED*
CONSEQUENCES OF THE USE OF SUCH WEAPONS IN WAR.

CERIUM + CESIUM + DEPOSITION + *FALLOUT + FISSION PRODUCT RELEASE + INGESTION + INHALATION + IODINE + PLUTONIUM + RADIATION DAMAGE + RUTHENIUM + STRONTIUM + URANIUM + *TEST, WEAPONS + ZIRCONIUM + RADIATION INJURY TREATMENT + ACCIDENT, HYPOTHETICAL + *NUCLEAR DETONATION + DOSE CALCULATION, EXTERNAL + *CONTAMINATION + *RADIOACTIVITY RELEASE + TROPOSPHERE + *MILITARY CONSIDERATION + NUCLEAR ATTACK + FORECAST + REACTOR, THERMONUCLEAR + CONCENTRATION + *RADIATION EFFECT + *RADIATION EXPOSURE + LIVESTOCK + SKIN + CLOUD + SOCIO/PHILOSOPHICAL CONSIDERATION + HPIS

082354
COOGAN JS
ESTIMATES OF DOSE EQUIVALENTS FROM FIVE INDIVIDUALS WORKING WITH VARIOUS TRITIUM COMPOUNDS
U.S. ENVIRONMENTAL PROTECTION AGENCY
PAPER NO. 113 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (SEE CONF-730603--)

BIOASSAY SAMPLES WERE COLLECTED FROM FIVE INDIVIDUALS WORKING WITH TRITIUM OXIDE AND TRITIATED LUMINOUS COMPOUNDS. THE RESULTING ESTIMATE OF DOSE EQUIVALENCE ON THESE INDIVIDUALS INDICATES THE VARIATION IN EXPOSURE WHICH IS ENCOUNTERED IN THE USE OF VARIOUS TRITIUM COMPOUNDS. THE PAPER DISCUSSES SOME PRACTICAL APPLICATION ASPECTS OF SAMPLING ENVIRONMENTAL CONCENTRATIONS AND ESTIMATING DOSE EQUIVALENCE WHEN USING TRITIUM OXIDE OR TRITIATED LUMINOUS COMPOUNDS. THE VALUES REPORTED INDICATE RELATIVE CONCENTRATIONS OF TRITIUM IN BODY WATER.

AVAILABILITY - JOHN S. COOGAN, NERC-LV, ENVIRONMENTAL PROTECTION AGENCY, P.O. BOX 15027, LAS VEGAS, NEVADA 89114

*DOSE + *ATMOSPHERIC POLLUTION + SAMPLING + CONTAMINATION + *PERSONNEL EXPOSURE, RADIATION + ENVIRONMENT + *BIOACCUMULATION/TURNOVER + CONCENTRATION + BIOLOGICAL CONTROL + HPIS

082780
ROHWER PS
RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON-85
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-730503-3 +. 16 PAGES, PAPER PRESENTED AT THE SYMPOSIUM ON ENVIRONMENTAL BEHAVIOR OF RADIONUCLIDES RELEASED IN THE NUCLEAR INDUSTRY, AIX-EN PROVINCE, FRANCE, MAY 14, 1973

TRITIUM (HTO) AND KR-85 ARE EXPECTED TO CONTINUE AS PROMINENT COMPONENTS OF THE RADIOACTIVE EFFLUENTS FROM NUCLEAR FACILITIES. SIMPLE COMPARISON OF AIR CONCENTRATIONS OF HTO AND KR-85 WITH THEIR RESPECTIVE MAXIMUM PERMISSIBLE CONCENTRATIONS DOES NOT PROVIDE A GOOD INDICATION OF THEIR RELATIVE RADIOLOGICAL IMPORTANCE. DETAILED CONSIDERATIONS FOR EACH RADIONUCLIDE EMPHASIZE DIFFERENCES WHICH INFLUENCE RADIOTOXICITY. DOSE ESTIMATES ARE PRESENTED, AND THE ASSOCIATED RISKS ARE COMPARED FOR EQUAL RADIONUCLIDE CONCENTRATION IN AIR: SOMATIC RISK (HTO ABOUT 10X KR-85) AND GENETIC RISK (HTO ABOUT 50X KR-85). FOR POPULATIONS IN CLOSE PROXIMITY TO THE FACILITY, H-3 WILL PROBABLY BE THE MOST SIGNIFICANT DOSE CONTRIBUTOR IF NEARLY EQUAL QUANTITIES OF THE TWO RADIONUCLIDES ARE RELEASED. IT IS PREDICTED THAT KR-85 WILL CONTRIBUTE THE GREATER DOSE TO THE GLOBAL POPULATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*KRYPTON + *ATMOSPHERIC POLLUTION + *POPULATION EXPOSURE + CONTAMINATION + SOIL + *RADIOACTIVITY RELEASE + WATER POLLUTION + CONCENTRATION + COMPARISON + *INDUSTRY, NUCLEAR

082792
UNRUH CM
RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD PRACTICES
BATTELLE PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
BNWL-SA-3390 +. 56 PAGES, JULY 1970

REPORTS A MANUAL OF GOOD PRACTICES WHICH PROVIDES RADIATION PROTECTION GUIDANCE FOR WORKING WITH TRITIUM AND TRITIUM COMPOUNDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CODES AND STANDARDS + *GUIDE + *PROCEDURES AND MANUALS + REGULATION + *RADIATION SAFETY AND CONTROL

082793
SILVER WJ + CHEW MH
HEALTH PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE
LAWRENCE LIVERMORE RADIATION LABORATORY, CALIFORNIA
UCRL-71327 + CONF-690103-11 +. 23 PAGES, FIGURES, JANUARY 15, 1969

BUILDING 331 PROVIDES A FACILITY FOR CHEMISTRY DEPARTMENT PERSONNEL AT LAWRENCE RADIATION LABORATORY TO PERFORM EXPERIMENTAL WORK WITH VARIOUS RADIOACTIVE LIGHT ISOTOPES AND GASES. AN IMPORTANT RADIOACTIVE ISOTOPE HANDLED IN THIS FACILITY IS TRITIUM. THE FACILITY IS DESIGNED TO SAFELY HANDLE UP TO A MEGACURIE OF TRITIUM. THIS PAPER DEALS PRIMARILY WITH THE FEATURES AND CONTROLS INCORPORATED THAT PERMIT LRL PERSONNEL TO SAFELY HANDLE THESE LARGE QUANTITIES OF TRITIUM. THE BUILDING STAFF INCLUDES TWELVE SENIOR RESEARCHERS, FIVE EXPERIMENTAL TECHNICIANS, SIX MECHANICAL/ELECTRONIC TECHNICIANS, AND ONE RADIATION SAFETY TECHNICIAN. ADDITIONAL RADIATION

082793 *CONTINUED*
SAFETY SUPPORT IS PROVIDED BY HEALTH PHYSICS ASSIGNED BY THE HAZARDS CONTROL DEPARTMENT TO SUPPORT THE CHEMISTRY DEPARTMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

HEALTH PHYSICS TRAINING + HAZARD, RELATIVE + *LRL + *RADIATION SAFETY AND CONTROL + *RADIOLOGICAL ASSISTANCE

083078
PETERSON KR
DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
PNE-RB-42 +. 25 PAGES, JUNE 12, 1973

ENVIRONMENTAL STATEMENTS ISSUED FOR GAS-STIMULATION PROJECTS REQUIRE ESTIMATES OF SURFACE CONCENTRATIONS AND DOSE TO INDIVIDUALS FOR TRITIUM AND KR-85 FROM FLARING OF THE GAS AND FOR NOBLE GASES AND RADIO-IODINE FOR THE POSSIBLE, BUT UNLIKELY, 'SEEP' AFTER DETONATION. THE PURPOSE OF THIS PAPER IS TO DETAIL THE PROCEDURES USED AT LAWRENCE LIVERMORE LABORATORY IN ARRIVING AT CONCENTRATION AND DOSE ESTIMATES THAT HAVE BEEN PRINTED IN THE ENVIRONMENTAL STATEMENTS FOR RIO BLANCO (WASH-1519) AND WAGON WHEEL (WASH-1524).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + IODINE + KRYPTON + NOBLE GAS + *SURFACE CONTAMINATION + NUCLEAR DETONATION + *POPULATION EXPOSURE + *DOSE CALCULATION, EXTERNAL + *GAS + CONCENTRATION + *STIMULATION + RESOURCE, NATURAL + BENEFICIAL USE + STATEMENT, ENVIRONMENTAL

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

ABSORBED FRACTION
064740 P 38
ABSORPTION
002551 P 1 017134 P 10 042771 P 18 043091 P 18
043246 P 19 044224 P 21 047898 P 22 051405 P 28
051406 P 28 051628 P 29 056159 P 31 061721 P 33
061912 P 32 064727 P 35 064732 P 37 064737 P 38
064748 P 39 065253 P 47 065935 P 48 070396 P 50
075523 P 52
ACCELERATOR
048419 P 23
ACCIDENT ANALYSIS
004672 P 1
ACCIDENT, DESIGN BASIS
064776 P 43
ACCIDENT, HYPOTHETICAL
043213 P 19 082319 P 55
ACCIDENT, MAXIMUM CREDIBLE (MCA)
004672 P 1 043213 P 19
ACCIDENT, MONITOR
067941 P 50
ACCIDENT, RADIOISOTOPE
067941 P 50
ACID
062623 P 34
ACTIVITY BUILDUP
037466 P 16
ADMINISTRATIVE CONTROL
007577 P 4
ADRENAL
067165 P 49
ADSORPTION
007422 P 3 021995 P 11 028491 P 13 062587 P 34
AEROSOL
013658 P 8 019434 P 10 045597 P 22
AEROSOL, RADIOACTIVE
026493 P 12
AGED
056179 P 31
AGENCY, AEC
039699 P 16 064749 P 40 065420 P 47
AGENCY, FEDERAL
065195 P 46 065296 P 47
AGRICULTURE
007226 P 2
AIR
007226 P 2 007507 P 4 007577 P 4 008708 P 6
029220 P 14 036557 P 16 042771 P 18 043100 P 18
051408 P 28 062587 P 34 064768 P 41 064780 P 45
064785 P 46 067088 P 49
AIR CLEANING
007430 P 4
AIRBORNE RELEASE
007422 P 3 017118 P 9 019535 P 10 024425 P 12
028579 P 14 055111 P 30 064776 P 43
ALLOY
028491 P 13
AMERICIUM
007852 P 5 013658 P 8 049527 P 24
AMINO ACID
040785 P 17 064733 P 37 064734 P 37
ANALYTICAL TECHNIQUE
006241 P 1 007363 P 2 007411 P 3 007577 P 4
007790 P 5 007852 P 5 008999 P 6 011635 P 7
027977 P 13 029220 P 14 029671 P 14 031065 P 15
036557 P 16 043273 P 19 055111 P 30 064729 P 36
064769 P 42 064779 P 44 064782 P 45 064784 P 45
065253 P 47 070413 P 51
ANIMAL
013758 P 8 023261 P 11 031417 P 15 051573 P 29
053130 P 30 065935 P 48 066331 P 48 075281 P 52
ANIMAL, FISH
064743 P 39 066272 P 48
ANIMAL, VERTEBRATE
049517 P 23 049533 P 24 049550 P 24 049585 P 24
049586 P 25 049600 P 25 049605 P 25 049639 P 26
049684 P 26 049700 P 26 049702 P 26 049711 P 27
049712 P 27 049713 P 27 049714 P 27 056158 P 30
056159 P 31 056179 P 31 058835 P 32 062563 P 33
062587 P 34 062623 P 34 064725 P 35 064727 P 35
064728 P 35 064729 P 36 064730 P 36 064731 P 36
064732 P 37 064733 P 37 064734 P 37 064737 P 38
064740 P 38 064741 P 38 064742 P 39 064743 P 39
064747 P 39 064748 P 39 064749 P 40 064753 P 40
064759 P 40 064766 P 41 064767 P 41 064768 P 41
064769 P 42 064772 P 42 064773 P 42 064776 P 43
064776 P 43 064777 P 44 064778 P 44 064779 P 44
064780 P 45 064782 P 45 064784 P 45 064785 P 46
067088 P 49 067136 P 49 067165 P 49
AQUATIC ORGANISM
007862 P 5 030135 P 15 043979 P 20 045018 P 22
ARGON
008708 P 6 048419 P 23
ASSIMILATION
043273 P 19 075281 P 52
ATMOSPHERIC CHEMISTRY
031061 P 15
ATMOSPHERIC DIFFUSION
007226 P 2 028579 P 14
ATMOSPHERIC POLLUTION
017134 P 10 043213 P 19 075576 P 53 077017 P 53
077309 P 54 082354 P 56 082780 P 56
AUTORADIOGRAPHY
049714 P 27 064741 P 38 064747 P 39 064748 P 39
064759 P 40
BACTERIA
040785 P 17 040787 P 17 053555 P 30
BARIUM
008708 P 6
BEHAVIOR
051407 P 28 051408 P 28 077833 P 55
BENEFICIAL USE
083078 P 57
BENEFICIAL USE, AGRICULTURE
056410 P 31 075915 P 53
BENEFICIAL USE, COMMERCIAL
075915 P 53
BENEFICIAL USE, SPACE HEATING
056410 P 31
BENEFIT VS RISK
064780 P 45 064782 P 45 064784 P 45 067088 P 49
070395 P 50 072960 P 52 075915 P 53
BERYLLIUM
007430 P 4
BETA EMITTER
017134 P 10 025635 P 12 061912 P 32 077199 P 54
BETA RAY
051314 P 28 054897 P 30
BIBLIOGRAPHY
004650 P 1 057579 P 32 062726 P 35 067088 P 49
BIOACCUMULATION/TURNOVER
057579 P 32 057580 P 32 061130 P 33 066272 P 48
070544 P 51 075576 P 53 082354 P 56
BIOCHEMICAL
049517 P 23 049600 P 25 051314 P 28 051402 P 28
054897 P 30 054914 P 30 064766 P 41 064769 P 42
064778 P 44
BIOLOGICAL CONTROL
043979 P 20 044015 P 21 048519 P 23 065253 P 47
075281 P 52 076703 P 53 077017 P 53 077191 P 54
077199 P 54 082354 P 56
BIOLOGICAL HALF-LIFE
043153 P 19 043273 P 19 044224 P 21 047898 P 22
048419 P 23 049605 P 25 049702 P 26 056158 P 30
056159 P 31 060933 P 33 062563 P 33 062587 P 34
062623 P 34 064727 P 35 064730 P 36 064732 P 37
064733 P 37 064734 P 37 064747 P 39 064749 P 40
064766 P 41 064767 P 41 064774 P 43 064775 P 43
064777 P 44 064778 P 44 064779 P 44 064785 P 46
065162 P 46 070413 P 51 071505 P 52 076703 P 53
BIOMEDICAL
021995 P 11 044674 P 21 045597 P 22 049600 P 25
055111 P 30 064747 P 39 064749 P 40 066272 P 48
072215 P 52 075281 P 52 077017 P 53
BIOTA
065195 P 46
BLOOD
043103 P 18 044224 P 21 049586 P 25 049639 P 26
049684 P 26 064727 P 35 064759 P 40 064778 P 44
064785 P 46 067165 P 49
BLOOD, PLASMA
064734 P 37 064747 P 39

BLOOD, SERUM
043197 P 19 049605 P 25 049684 P 26
BODY BURDEN
017134 P 10 048419 P 23 049713 P 27 056159 P 31
064730 P 36 064775 P 43 064782 P 45 064784 P 45
065122 P 46 065162 P 46 071195 P 51
BODY FLUID
043306 P 20 045384 P 22 049605 P 25 049684 P 26
049702 P 26 049713 P 27 056159 P 31 064727 P 35
064728 P 35 064731 P 36 064747 P 39 064748 P 39
064766 P 41 064774 P 43 065162 P 46 065935 P 48
067088 P 49 070544 P 51 071194 P 51 071505 P 52
BONE
049527 P 24 049585 P 24 049639 P 26 064728 P 35
064734 P 37 064778 P 44 064785 P 46 077017 P 53
BONE, MARROW
049586 P 25 049600 P 25 049684 P 26 049714 P 27
061130 P 33 062623 P 34 064747 P 39 064748 P 39
064759 P 40 067165 P 49
BRAIN
049533 P 24 049600 P 25 049684 P 26 049713 P 27
062623 P 34 064728 P 35 064734 P 37 064743 P 39
064777 P 44 064778 P 44 067165 P 49
BROMINE
051998 P 29
CALCINATION
007507 P 4
CALVERT CLIFFS 1 (PWR)
038641 P 16 043979 P 20 044109 P 21 056410 P 31
065420 P 47
CALVERT CLIFFS 2 (PWR)
038641 P 16
CANADA
003269 P 1 011919 P 7 017335 P 10 021995 P 11
056159 P 31 064725 P 35 064776 P 43
CANCER
049600 P 25 066331 P 48
CARBON
007226 P 2 007852 P 5 008708 P 6 029671 P 14
049517 P 23 049586 P 25 054534 P 30 062687 P 34
064769 P 42 064785 P 46 065198 P 47 065296 P 47
067136 P 49 077017 P 53
CARCINOGEN
077017 P 53
CELL
052315 P 29 064737 P 38 064740 P 38 064741 P 38
064753 P 40 064759 P 40 065659 P 48
CELL, NUCLEOLUS
064741 P 38
CELL, NUCLEUS
040785 P 17 049684 P 26 058835 P 32 064737 P 38
064740 P 38 064753 P 40 064772 P 42
CELL, STEM
041900 P 17
CERIUM
007862 P 5 061130 P 33 082319 P 55
CESIUM
007226 P 2 007411 P 3 007420 P 3 007422 P 3
007507 P 4 007852 P 5 007862 P 5 008708 P 6
008806 P 6 013658 P 8 013758 P 8 019434 P 10
021935 P 11 041584 P 17 043979 P 20 061130 P 33
065420 P 47 066331 P 48 077017 P 53 080838 P 55
082319 P 55
CHALK RIVER
006997 P 2 019535 P 10 021995 P 11 024143 P 12
027860 P 13 044674 P 21 056159 P 31 066272 P 48
CHAMBER, ION
031061 P 15
CHARCOAL
007422 P 3
CHELATE
065659 P 48
CHEMICAL KINETICS
056159 P 31
CHEMICAL SHIM
037466 P 16
CHESAPEAKE BAY
065420 P 47
CHLORINE
043246 P 19
CHROMOSOMAL EFFECT
041900 P 17 049714 P 27 052906 P 30 053555 P 30
054639 P 30 064759 P 40 064772 P 42 065659 P 48
066331 P 48 077199 P 54
CIVIL DEFENSE
064737 P 38 067964 P 50
CLOUD
082319 P 55
COBALT
007390 P 2 007507 P 4 054639 P 30 065420 P 47
070413 P 51
CODES AND STANDARDS
040379 P 17 043979 P 20 062587 P 34 064725 P 35
064749 P 40 064774 P 43 064775 P 43 064776 P 43
065195 P 46 065198 P 47 065296 P 47 066510 P 49
067136 P 49 080838 P 55 082792 P 56
COMPARISON
047898 P 22 051573 P 29 051582 P 29 054639 P 30
065935 P 48 067964 P 50 071194 P 51 077143 P 54
077309 P 54 082780 P 56
COMPLIANCE
017118 P 9
COMPONENTS
051407 P 28
COMPOSITE MATERIAL
054534 P 30
COMPUTER PROGRAM
006867 P 2 007422 P 3 030135 P 15 041584 P 17
CONCENTRATION
002551 P 1 006241 P 1 007411 P 3 007420 P 3
007422 P 3 007461 P 4 007507 P 4 007677 P 5
007790 P 5 007862 P 5 008806 P 6 008999 P 6
013758 P 8 016916 P 9 017134 P 10 019434 P 10
020666 P 10 021935 P 11 023261 P 11 024425 P 12
026493 P 12 027860 P 13 027977 P 13 029220 P 14
031065 P 15 031396 P 15 036557 P 16 042771 P 18
043091 P 18 043103 P 18 043197 P 19 043246 P 19
043273 P 19 043593 P 20 044015 P 21 045384 P 22
045385 P 22 047898 P 22 048419 P 23 049533 P 24
049639 P 26 049713 P 27 051402 P 28 051403 P 28
051573 P 29 051998 P 29 060933 P 33 062623 P 34
062687 P 34 064729 P 35 064737 P 38 064743 P 39
064748 P 39 064778 P 44 064785 P 46 065122 P 46
065162 P 46 065253 P 47 067941 P 50 070396 P 50
071194 P 51 075915 P 53 077143 P 54 082319 P 55
082354 P 56 082780 P 56 083078 P 57
CONCENTRATION FACTOR
070544 P 51
CONCENTRATION, GROUND LEVEL
062687 P 34
CONCENTRATION, MAXIMUM
028579 P 14
CONCRETE
082305 P 55
CONGRESSIONAL ACTIVITY
043979 P 20 044015 P 21 056410 P 31
CONGRESSMAN
056410 P 31
CONSUMER PRODUCT
002551 P 1 048519 P 23 075915 P 53
CONTAINMENT
043571 P 20 077191 P 54 082305 P 55
CONTAINMENT LEAKAGE CONTROL
082305 P 55
CONTAINMENT R AND D
044674 P 21
CONTAINMENT, HIGH PRESSURE
004672 P 1
CONTAINMENT, UNDERGROUND
075915 P 53
CONTAMINATION
006997 P 2 010200 P 7 019535 P 10 024425 P 12
042771 P 18 048419 P 23 049197 P 23 057580 P 32
070413 P 51 075915 P 53 077017 P 53 077143 P 54
082319 P 55 082354 P 56 082780 P 56
CONTROL
056410 P 31
CONTROL PANEL/ROOM
004672 P 1
COOLANT CHEMISTRY
037466 P 16
COOLANT PURIFICATION SYSTEM
016512 P 9
CORRELATION
049586 P 25 056158 P 30 064728 P 35 064730 P 36
064741 P 38 064743 P 39 064749 P 40 064772 P 42
064773 P 42 064777 P 44 064785 P 46 067136 P 49
COSMIC RADIATION
062687 P 34 077017 P 53
COUNTER
007430 P 4 011635 P 7 031417 P 15 043273 P 19
070413 P 51
COUNTER, WHOLE BODY
007411 P 3 007422 P 3 007430 P 4 007507 P 4
008806 P 6
CRITICAL MASS
062623 P 34 064733 P 37 064748 P 39 064774 P 43
067165 P 49
CRITICAL NUCLIDE
070396 P 50
CRITICAL NUCLIDE PATHWAY
070396 P 50 075281 P 52 075576 P 53 077833 P 55

CRUSTACEAN
006867 P 2 013658 P 8 043979 P 20
CULTURE
040785 P 17
CURIUM
013658 P 8 021935 P 11
DAMAGE
052834 P 29
DATA COLLECTION
043979 P 20 044015 P 21 045018 P 22 065195 P 46
065420 P 47 077191 P 54
DECAY HEAT
016512 P 9 077199 P 54
DECOMPOSITION
053555 P 30
DECONTAMINATION
007430 P 4 007577 P 4 048419 P 23 066510 P 49
DEPOSITION
007422 P 3 007507 P 4 026493 P 12 043306 P 20
048419 P 23 062687 P 34 066331 P 48 070413 P 51
077833 P 55 082319 P 55
DESORPTION
028491 P 13 082305 P 55
DEUTERIUM
007430 P 4 051582 P 29 064769 P 42 075281 P 52
DIETARY HABIT
007226 P 2 045384 P 22 045385 P 22 064742 P 39
064785 P 46 077017 P 53
DIFFUSION COEFFICIENT
007422 P 3
DILUTICN
051405 P 28
DISTRIBUTION
017134 P 10 043091 P 18 049527 P 24 049585 P 24
049586 P 25 049600 P 25 049639 P 26 049684 P 26
049713 P 27 058835 P 32 062623 P 34 064728 P 35
064778 P 44 064785 P 46 067165 P 49 072960 P 52
075281 P 52
DISTRIBUTION, MICRO
058835 P 32 064740 P 38 064749 P 40 064753 P 40
DIVERSITY, SPECIES
064743 P 39
DNA
017134 P 10 040787 P 17 044015 P 21 049714 P 27
058835 P 32 064733 P 37 064737 P 38 064741 P 38
064742 P 39 064743 P 39 064749 P 40 064753 P 40
064766 P 41 064772 P 42 065296 P 47 065659 P 48
067088 P 49
DOSE
002551 P 1 004672 P 1 008708 P 6 008999 P 6
016916 P 9 017134 P 10 017335 P 10 019535 P 10
021995 P 11 024425 P 12 025635 P 12 031417 P 15
045018 P 22 045384 P 22 045385 P 22 047898 P 22
051403 P 28 051408 P 28 052315 P 29 052834 P 29
056410 P 31 065122 P 46 065198 P 47 065253 P 47
070396 P 50 070413 P 51 071505 P 52 075523 P 52
077309 P 54 077833 P 55 080838 P 55 082354 P 56
083078 P 57
DOSE CALCULATION, EXTERNAL
002551 P 1 007226 P 2 007363 P 2 007390 P 2
016916 P 9 017335 P 10 021935 P 11 028579 P 14
030135 P 15 042771 P 18 043213 P 19 064741 P 38
067941 P 50 067964 P 50 077309 P 54 082319 P 55
083078 P 57
DOSE CALCULATION, INTERNAL
007226 P 2 007411 P 3 007420 P 3 008806 P 6
013658 P 8 016916 P 9 017134 P 10 017335 P 10
021935 P 11 021995 P 11 023261 P 11 027868 P 13
028579 P 14 030135 P 15 031417 P 15 041584 P 17
049527 P 24 049550 P 24 049585 P 24 049586 P 25
049600 P 25 049605 P 25 049639 P 26 049684 P 26
049702 P 26 049714 P 27 058835 P 32 060933 P 33
061130 P 33 061931 P 33 062587 P 34 062623 P 34
064725 P 35 064728 P 35 064729 P 36 064731 P 36
064732 P 37 064733 P 37 064740 P 38 064741 P 38
064749 P 40 064753 P 40 064759 P 40 064772 P 42
064774 P 43 064775 P 43 064776 P 43 064778 P 44
064780 P 45 067088 P 49 067136 P 49 067165 P 49
070544 P 51 071505 P 52 077309 P 54
DOSE MEASUREMENT, EXTERNAL
007390 P 2 007507 P 4 007862 P 5 011635 P 7
011919 P 7 013658 P 8 062687 P 34 071194 P 51
077309 P 54
DOSE MEASUREMENT, INTERNAL
007790 P 5 007862 P 5 008806 P 6 024143 P 12
029220 P 14 036557 P 16 062687 P 34 070413 P 51
071194 P 51 077309 P 54
DOSIMETRY
002551 P 1 006997 P 2 007363 P 2 007390 P 2
007422 P 3 007430 P 4 007507 P 4 007577 P 4
013658 P 8 019434 P 10 027860 P 13 029671 P 14
030135 P 15 043091 P 18 043197 P 19 045597 P 22
048419 P 23 062687 P 34 064740 P 38 066272 P 48
077017 P 53
DOSIMETRY, CLINICAL
040379 P 17 043197 P 19 043246 P 19 048419 P 23
077017 P 53
DOSIMETRY, PHOTOGRAPHIC
031061 P 15
DOSIMETRY, RADIOPHOTOLUMINESCENCE
031061 P 15
DOSIMETRY, THERMOLUMINESCENCE
031061 P 15 066272 P 48
DRY
067165 P 49
EARTHQUAKE
030135 P 15
EARTHQUAKE ENGINEERING
021935 P 11
ECOLOGY
007226 P 2 013658 P 8 016916 P 9 030135 P 15
038641 P 16 044471 P 21 044674 P 21 056410 P 31
070396 P 50 075576 P 53
ECONOMICS
007852 P 5 021935 P 11 056410 P 31
ECOSYSTEM, AQUATIC
066272 P 48 075576 P 53
ECOSYSTEM, ESTUARINE
075576 P 53
ECOSYSTEM, MARINE
075576 P 53
ECOSYSTEM, MODEL
075576 P 53
EFFECT
017134 P 10 048419 P 23 051314 P 28 051402 P 28
052906 P 30 053130 P 30 053555 P 30 064732 P 37
EFFECT, AGE
043273 P 19 045384 P 22 049702 P 26 056158 P 30
056179 P 31 064767 P 41 071505 P 52
EFFECT, DOSE
049533 P 24 049714 P 27 058835 P 32 064740 P 38
064741 P 38 064772 P 42 065659 P 48 066331 P 48
077199 P 54
EFFECT, DOSE RATE
066331 P 48 077199 P 54
EFFECT, GENETIC
040787 P 17 043091 P 18 043979 P 20 044015 P 21
049712 P 27 049714 P 27 051968 P 29 065195 P 46
065296 P 47 065420 P 47 066272 P 48 067088 P 49
077017 P 53 077143 P 54 077199 P 54
EFFECT, MASS
064769 P 42
EFFECT, SOMATIC
065296 P 47 065420 P 47 066272 P 48 077143 P 54
077199 P 54
EFFLUENT
007226 P 2 043571 P 20 044471 P 21 065122 P 46
065195 P 46 066272 P 48 067941 P 50 077017 P 53
077191 P 54 080838 P 55
EGCR (AGR)
004672 P 1
EGG
064785 P 46
ELECTRIC POWER
065195 P 46
ELIMINATION
043091 P 18 043100 P 18 043153 P 19 075281 P 52
ELK RIVER (BWR)
043571 P 20
EMBRYO
017134 P 10 049527 P 24
EMERGENCY PROCEDURE
007363 P 2
ENERGY LEVEL
024143 P 12 025635 P 12
ENERGY SPECTRUM
064731 P 36
ENVIRONMENT
031417 P 15 044674 P 21 049702 P 26 051408 P 28
056158 P 30 056159 P 31 062687 P 34 062726 P 35
064767 P 41 065195 P 46 067088 P 49 070395 P 50
070544 P 51 075576 P 53 077017 P 53 077191 P 54
082354 P 56
ENVIRONMENTAL CONTROL MEASURE
044109 P 21 049713 P 27
ENVIRONMENTAL PROTECTION AGENCY (EPA)
080838 P 55
ENZYME
040787 P 17 065659 P 48
EQUATION
016916 P 9 065253 P 47
EQUILIBRIUM

044224 P 21 077309 P 54
EQUIPMENT
043122 P 18
EURATOM
075576 P 53
EXCRETION
017134 P 10 043197 P 19 070413 P 51 075523 P 52
076703 P 53
EXCRETION, FECAL
047898 P 22
EXCRETION, URINE
007363 P 2 007577 P 4 007790 P 5 007852 P 5
027977 P 13 029220 P 14 029671 P 14 031065 P 15
043273 P 19 043306 P 20 045384 P 22 047898 P 22
048519 P 23 049517 P 23 049550 P 24 049605 P 25
049700 P 26 056159 P 31 060933 P 33 062563 P 33
062587 P 34 064725 P 35 064727 P 35 064729 P 36
064730 P 36 064742 P 39 064747 P 39 064767 P 41
064768 P 41 064774 P 43 064775 P 43 064779 P 44
064780 P 45 064782 P 45 064784 P 45 065253 P 47
065935 P 48 070544 P 51 071194 P 51
EXPERIMENT
043103 P 18 043197 P 19 065122 P 46
EXPONENTIAL FUNCTION
049550 P 24 049605 P 25 049684 P 26 064727 P 35
064729 P 36 064730 P 36 064775 P 43 064777 P 44
064778 P 44 064779 P 44 067165 P 49
EXPOSURE, ACUTE
043100 P 18 043153 P 19 067088 P 49 071505 P 52
EXPOSURE, BACKGROUND
049713 P 27 064731 P 36 064768 P 41 064785 P 46
077017 P 53
EXPOSURE, CHRONIC
049197 P 23 049533 P 24 049684 P 26 049713 P 27
051407 P 28 064728 P 35 064766 P 41 064777 P 44
064778 P 44 067088 P 49 067165 P 49
EXPOSURE, IM
067165 P 49
EXPOSURE, IP
049586 P 25 062623 P 34 064728 P 35 064741 P 38
064778 P 44
EXPOSURE, IV
043103 P 18 049527 P 24 049585 P 24 049600 P 25
049714 P 27 062623 P 34 064747 P 39 064753 P 40
EXPOSURE, SC
049527 P 24 058835 P 32
EXPOSURE, SKIN
044224 P 21 049197 P 23 056159 P 31 064725 P 35
064732 P 37
FAILURE, ADMINISTRATIVE CONTROL
010200 P 7 010561 P 7 015084 P 9 017118 P 9
FAILURE, DESIGN ERROR
015084 P 9
FAILURE, EQUIPMENT
015083 P 8
FAILURE, OPERATOR ERROR
009302 P 7 014080 P 8 026087 P 12
FAILURE, TUBING
016512 P 9
FALLOUT
004672 P 1 007422 P 3 007430 P 4 016916 P 9
019434 P 10 044674 P 21 061130 P 33 064785 P 46
082319 P 55
FAST NEUTRON
048419 P 23
FAT
049585 P 24 049713 P 27 051407 P 28 062623 P 34
064727 P 35 064728 P 35 064766 P 41 064769 P 42
064777 P 44 064778 P 44
FEMALE
049517 P 23 049527 P 24 049533 P 24 049639 P 26
056179 P 31 064732 P 37 064737 P 38 064779 P 44
FETUS
017134 P 10 049527 P 24 049533 P 24 049639 P 26
077199 P 54
FIELD EXPERIMENT
070544 P 51
FILTERS
007430 P 4
FIRE
043213 P 19
FISSION GAS RELEASE
007507 P 4 045018 P 22
FISSION PRODUCT RELEASE
004672 P 1 013458 P 7 044109 P 21 045018 P 22
065198 P 47 065296 P 47 065420 P 47 067964 P 50
082319 P 55
FISSION PRODUCT RETENTION
076703 P 53
FISSION PRODUCT, VOLATILE
037466 P 16
FOOD
007507 P 4 045385 P 22 048419 P 23 057580 P 32
064743 P 39 070396 P 50
FOOD CHAIN
017134 P 10 043979 P 20 044109 P 21 044471 P 21
045385 P 22 051314 P 28 057580 P 32 061721 P 33
064737 P 38 064743 P 39 064776 P 43 070396 P 50
070544 P 51 075576 P 53 077017 P 53
FOOD INTAKE
064737 P 38 064742 P 39 064785 P 46
FORECAST
075576 P 53 082319 P 55
FPC
065296 P 47
FRANCE
057580 P 32
FRC
016916 P 9 043979 P 20
FUEL INTEGRITY
043571 P 20
FUEL REPROCESSING
043979 P 20 056410 P 31 065122 P 46 065195 P 46
077017 P 53
GAMMA
019434 P 10 054639 P 30 077309 P 54
GAMMA EMITTER
067964 P 50
GAS
002551 P 1 011635 P 7 043306 P 20 049585 P 24
049711 P 27 051402 P 28 051403 P 28 062587 P 34
064727 P 35 064728 P 35 064729 P 36 064731 P 36
064732 P 37 064733 P 37 075915 P 53 077143 P 54
083078 P 57
GEOLOGY
007507 P 4 065420 P 47
GEOLOGY, SALT STRUCTURE
021935 P 11
GERMANY
008708 P 6 028925 P 14 031396 P 15 048419 P 23
GI TRACT
043091 P 18 044224 P 21 049586 P 25 062623 P 34
064727 P 35 064728 P 35 064748 P 39 065935 P 48
075281 P 52
GLOVE BOX
007430 P 4 015084 P 9 026087 P 12
GROSS ALPHA
006867 P 2 007577 P 4 007852 P 5 007862 P 5
GROSS BETA
006867 P 2 007577 P 4 007852 P 5 007862 P 5
027860 P 13 062687 P 34
GROSS GAMMA
007577 P 4 007862 P 5 027860 P 13 062687 P 34
GROUND WATER, NUCLIDE OCCURRENCE
007507 P 4
GUIDE
072960 P 52 082792 P 56
HAIR
077199 P 54
HALF-LIFE, EFFECTIVE
071505 P 52 076703 P 53
HANFORD SITE
044674 P 21
HAZARD, RELATIVE
002551 P 1 007399 P 3 017134 P 10 049712 P 27
057579 P 32 058835 P 32 061931 P 33 064733 P 37
064740 P 38 064741 P 38 064749 P 40 064753 P 40
064772 P 42 064778 P 44 067088 P 49 067165 P 49
070413 P 51 077191 P 54 080838 P 55 082793 P 56
HAZARDS ANALYSIS
007399 P 3 007430 P 4 007461 P 4 007507 P 4
013658 P 8 024425 P 12 027977 P 13 064732 P 37
064766 P 41 064774 P 43 072960 P 52 082305 P 55
HEALTH PHYSICS TRAINING
003269 P 1 013658 P 8 024425 P 12 030135 P 15
082305 P 55 082793 P 56
HEART
049533 P 24 049585 P 24 049600 P 25 049713 P 27
062623 P 34 064728 P 35 064734 P 37 064778 P 44
064785 P 46
HEAT EXCHANGERS
016512 P 9
HEAVY WATER
043103 P 18 043122 P 18 043153 P 19 043197 P 19
043593 P 20
HIGH
051402 P 28 051403 P 28 052834 P 29
HIGH RADIATION
048419 P 23
HISTOPATHOLOGY
049714 P 27
HOUR

064727 P 35 064747 P 39 064748 P 39
HPIS
077017 P 53 077143 P 54 077191 P 54 077199 P 54
082305 P 55 082319 P 55 082354 P 56
HUMIDITY, RELATIVE
031061 P 15
HUNGARY
064729 P 36
HYDROGEN
024425 P 12 031417 P 15 064769 P 42 067088 P 49
075281 P 52 077833 P 55
HYDROLOGY
007507 P 4 065420 P 47
IAEA
017134 P 10 064759 P 40
IC GROSSLY NORMAL
049527 P 24 049605 P 25 056159 P 31 064779 P 44
064780 P 45 064782 P 45
IC PATHOLOGICAL
049517 P 23 049600 P 25 064747 P 39
ICRP
007226 P 2 017134 P 10 025635 P 12 031065 P 15
040379 P 17 043979 P 20 044015 P 21 048419 P 23
049684 P 26 049711 P 27 049712 P 27 062623 P 34
064727 P 35 064730 P 36 064732 P 37 064733 P 37
064749 P 40 064773 P 42 064774 P 43 064775 P 43
064776 P 43 064780 P 45 065296 P 47 067088 P 49
067136 P 49
IDAHO FALLS
007507 P 4
IMMATURE
056179 P 31
IN VITRO
049712 P 27 049714 P 27 064769 P 42 064772 P 42
INCIDENT
015081 P 8 015084 P 9 017118 P 9
INCIDENT, EQUIPMENT
015083 P 8
INCIDENT, EXPOSURE
043153 P 19 060933 P 33
INCIDENT, FATALITY
060933 P 33 077199 P 54
INCIDENT, NONREACTOR
009025 P 6 010561 P 7
INDUSTRIAL SAFETY
043100 P 18 043306 P 20
INDUSTRY, MANUFACTURING
064730 P 36 064780 P 45 064782 P 45 064784 P 45
INDUSTRY, NUCLEAR
043979 P 20 056410 P 31 077017 P 53 080838 P 55
082780 P 56
INDUSTRY, UTILITY
056410 P 31
INFANT
056179 P 31 064776 P 43
INGESTION
007411 P 3 007422 P 3 007461 P 4 008806 P 6
016916 P 9 024425 P 12 027868 P 13 028579 P 14
037466 P 16 044224 P 21 049517 P 23 049527 P 24
049533 P 24 049586 P 25 058835 P 32 066727 P 35
064728 P 35 064742 P 39 064748 P 39 064766 P 41
064785 P 46 065253 P 47 067088 P 49 070396 P 50
082319 P 55
INHALATION
007422 P 3 007461 P 4 008806 P 6 015081 P 8
015083 P 8 016916 P 9 024425 P 12 026087 P 12
026493 P 12 027977 P 13 028579 P 14 031065 P 15
037466 P 16 043213 P 19 043306 P 20 044224 P 21
045597 P 22 048419 P 23 049550 P 24 049585 P 24
051402 P 28 056159 P 31 060933 P 33 061721 P 33
062587 P 34 062687 P 34 064727 P 35 064728 P 35
064785 P 46 065253 P 47 067088 P 49 070396 P 50
075523 P 52 082319 P 55
INORGANIC
049586 P 25 064730 P 36 064733 P 37
INSECT
049714 P 27
INSTRUMENT CALIBRATION
007363 P 2 007430 P 4 007507 P 4 048419 P 23
INSTRUMENTS, MISC.
007430 P 4 048419 P 23 051998 P 29
INTAKE
042771 P 18 062587 P 34 064727 P 35
INTERNATIONAL
065198 P 47
INTESTINE, LARGE
049600 P 25
INTESTINE, SMALL
049600 P 25 049684 P 26 058835 P 32 064734 P 37
064748 P 39
IODINE
007226 P 2 007422 P 3 007430 P 4 007507 P 4
007862 P 5 008708 P 6 013758 P 8 016916 P 9
026493 P 12 027868 P 13 048419 P 23 049527 P 24
065198 P 47 065296 P 47 066331 P 48 072215 P 52
080838 P 55 082319 P 55 083078 P 57
ION EXCHANGE
007422 P 3 007507 P 4 075281 P 52
IONOSPHERE
007507 P 4
IRON
019434 P 10 026493 P 12 054914 P 30 077017 P 53
ISOTOPIC FRACTIONATION
064769 P 42
KARLSRUHE
082305 P 55
KIDNEY
049533 P 24 049585 P 24 049586 P 25 049600 P 25
049713 P 27 058835 P 32 062623 P 34 064728 P 35
064734 P 37 064748 P 39 064778 P 44 064785 P 46
067165 P 49
KRYPTON
008708 P 6 013658 P 8 021935 P 11 043979 P 20
044471 P 21 045018 P 22 049585 P 24 065195 P 46
072960 P 52 075915 P 53 077017 P 53 077143 P 54
077309 P 54 080838 P 55 082780 P 56 083078 P 57
LAKE
057579 P 32 066272 P 48
LASL
007577 P 4
LEACHING
082305 P 55
LEAK RATE
082305 P 55
LEGISLATION
064725 P 35
LINEAR ENERGY TRANSFER
064731 P 36 064740 P 38 077199 P 54
LIQUID
049711 P 27 051406 P 28 064727 P 35 064728 P 35
064729 P 36 064731 P 36 064732 P 37 064733 P 37
LIVER
049527 P 24 049533 P 24 049586 P 25 049600 P 25
049639 P 26 049684 P 26 049713 P 27 058835 P 32
062623 P 34 064728 P 35 064743 P 39 064748 P 39
064778 P 44 064785 P 46 067165 P 49
LIVESTOCK
043103 P 18 061721 P 33 082319 P 55
LRL
082793 P 56
LUMINARY
047898 P 22 064730 P 36 064779 P 44 064780 P 45
064782 P 45 064786 P 45 065935 P 48 071195 P 51
LUNG
049585 P 24 049586 P 25 049600 P 25 062623 P 34
062687 P 34 064736 P 37 064778 P 44 075281 P 52
075523 P 52
LYMPH NODE
062623 P 34
MAIN COOLING SYSTEM
037466 P 16
MALE
049517 P 23 049605 P 25 056179 P 31 058835 P 32
062563 P 33 064727 P 35 064732 P 37 064737 P 38
064741 P 38 064747 P 39 064748 P 39 067165 P 49
MAMMAL, DOG
013758 P 8 049527 P 24 064743 P 39 064773 P 42
MAMMAL, LARGE
043593 P 20 049713 P 27 064773 P 42 064777 P 44
064778 P 44
MAMMAL, MOUSE
051402 P 28 051968 P 29 052906 P 30 054897 P 30
058835 P 32 064728 P 35 064733 P 37 064734 P 37
064741 P 38 064748 P 39 064759 P 40 064773 P 42
MAMMAL, RAT
047898 P 22 049527 P 24 049533 P 24 049586 P 25
049639 P 26 049684 P 26 049714 P 27 051582 P 29
051628 P 29 052834 P 29 054914 P 30 062623 P 34
064728 P 35 064737 P 38 064743 P 39 064748 P 39
064753 P 40 064766 P 41 064769 P 42 064773 P 42
064777 P 44 064778 P 44 065122 P 46 067136 P 49
MAMMAL, RODENT
013758 P 8 043100 P 18 049714 P 27
MAMMAL, SMALL
043103 P 18 043593 P 20 047898 P 22 049527 P 24
064743 P 39 064748 P 39 064772 P 42 064773 P 42
064777 P 44 067165 P 49
MAN
006241 P 1 007411 P 3 007420 P 3 007422 P 3
007461 P 4 007677 P 5 007790 P 5 007862 P 5
008806 P 6 008999 P 6 013758 P 8 016916 P 9
019434 P 10 020666 P 10 024425 P 12 026493 P 12

027860 P 13 027977 P 13 029220 P 14 031065 P 15
031396 P 15 031417 P 15 036557 P 16 041900 P 17
043091 P 18 045384 P 22 045385 P 22 049517 P 23
049550 P 24 049585 P 24 049586 P 25 049600 P 25
049605 P 25 049700 P 26 049702 P 26 049711 P 27
049712 P 27 049714 P 27 051403 P 28 051404 P 28
051405 P 28 051406 P 28 051407 P 28 051408 P 28
051573 P 29 051967 P 29 051998 P 29 056158 P 30
056159 P 31 056179 P 31 057580 P 32 061721 P 33
061912 P 32 062563 P 33 062587 P 34 064725 P 35
064727 P 35 064729 P 36 064730 P 36 064731 P 36
064732 P 37 064733 P 37 064734 P 37 064737 P 38
064740 P 38 064747 P 39 064749 P 40 064766 P 41
064767 P 41 064768 P 41 064773 P 42 064774 P 43
064776 P 43 064777 P 44 064778 P 44 064779 P 44
064780 P 45 064782 P 45 064784 P 45 064785 P 46
065253 P 47 066272 P 48 066331 P 48 067088 P 49
067136 P 49 070544 P 51 071505 P 52 075281 P 52
075523 P 52 076703 P 53 077017 P 53 077833 P 55

MANGANESE
007862 P 5 013758 P 8

MASS
049533 P 24 049585 P 24 056158 P 30 056159 P 31
064737 P 38 064743 P 39 064773 P 42 064777 P 44
067165 P 49

MATHEMATICAL STUDY
031065 P 15

MATHEMATICAL TREATMENT
016916 P 9 024425 P 12 028579 P 14 052315 P 29
064774 P 43 065253 P 47

MATURE
049586 P 25 049605 P 25 056158 P 30 056159 P 31
056179 P 31 058835 P 32 062563 P 33 062587 P 34
062623 P 34 064727 P 35 064732 P 37 064737 P 38
064741 P 38 064747 P 39 064748 P 39 064767 P 41
064768 P 41 064774 P 43 064776 P 43 064779 P 44
064780 P 45 064782 P 45 064784 P 45 067088 P 49
067165 P 49

MEASUREMENT
031396 P 15 036557 P 16 043197 P 19 048419 P 23
065122 P 46 065162 P 46 066510 P 49 075281 P 52
077191 P 54 082305 P 55

MEASUREMENT, REACTIVITY
029671 P 14

MERCURY
007430 P 4

METABOLIC KINETICS
056159 P 31 064727 P 35 075281 P 52

METAL
028491 P 13

METEOROLOGICAL SUPPORT
007507 P 4

METEOROLOGY
048419 P 23 065420 P 47

MILITARY CONSIDERATION
082319 P 55

MILK
007507 P 4 057580 P 32 061721 P 33 064768 P 41
064776 P 43 064785 P 46 070396 P 50 077199 P 54

MINERAL EXCHANGE
007507 P 4 013658 P 8 021935 P 11

MITOSIS
064740 P 38 064741 P 38 064759 P 40

MODEL
041584 P 17 070396 P 50 071505 P 52 077833 P 55

MODEL, BIOLOGICAL
064733 P 37 064734 P 37 064737 P 38 064740 P 38
064742 P 39 064743 P 39 064748 P 39 064753 P 40
064759 P 40 064766 P 41 064773 P 42 064774 P 43
066331 P 48 067088 P 49

MODEL, DETERMINISTIC
075576 P 53

MOLECULAR EFFECT
066331 P 48

MONITOR
007430 P 4 007577 P 4 007862 P 5 066510 P 49
082305 P 55

MONITOR, AIR
007363 P 2 007422 P 3 007430 P 4 007862 P 5
055111 P 30 064780 P 45

MONITOR, AREA
040379 P 17 061931 P 33

MONITOR, BACKGROUND
062687 P 34 064780 P 45

MONITOR, EMERGENCY
006997 P 2 007577 P 4 066510 P 49

MONITOR, ENVIRONMENTAL
007363 P 2 007461 P 4 007507 P 4 016916 P 9
064768 P 41 066510 P 49 067941 P 50 077191 P 54

MONITOR, GAS
007862 P 5

MONITOR, GENERAL PRACTICE
004650 P 1 007577 P 4 066510 P 49

MONITOR, LIQUID
007363 P 2 055111 P 30

MONITOR, PERSONNEL
006997 P 2 007363 P 2 007461 P 4 007577 P 4
008806 P 6 027860 P 13 029220 P 14 029671 P 14
031061 P 15 048519 P 23 064779 P 44 064780 P 45
064782 P 45 064784 P 45 066510 P 49

MONITOR, SAMPLING
056158 P 30

MONITOR, STACK
007430 P 4

MONITORING PROGRAM, ENVIRONMENTAL
066272 P 48

MONITORING SYSTEM, RADIATION
027977 P 13 055111 P 30 066510 P 49

MONTH
049600 P 25 049605 P 25 049684 P 26 051407 P 28
058835 P 32 062563 P 33 062623 P 34 064728 P 35
064729 P 36 064734 P 37 064775 P 43 064777 P 44
064778 P 44 067165 P 49

MORPHOLOGY
049527 P 24 064741 P 38

MPBB
007852 P 5 020666 P 10 036557 P 16 039699 P 16
049197 P 23 062587 P 34 064729 P 36 064730 P 36
064732 P 37 064733 P 37 064768 P 41 064773 P 42
064774 P 43 064775 P 43 064776 P 43 064784 P 45
067088 P 49

MPC
007226 P 2 007363 P 2 007461 P 4 007577 P 4
008708 P 6 011635 P 7 013758 P 8 015083 P 8
028579 P 14 039699 P 16 043100 P 18 044015 P 21
048419 P 23 049684 P 26 049711 P 27 051573 P 29
061912 P 32 062587 P 34 064727 P 35 064730 P 36
064732 P 37 064733 P 37 064773 P 42 064776 P 43
067088 P 49 070395 P 50 072960 P 52 075523 P 52
077143 P 54 080838 P 55

MPD
004672 P 1 007363 P 2 007420 P 3 007577 P 4
008806 P 6 011635 P 7 043091 P 18 067136 P 49

MUSCLE
049585 P 24 049600 P 25 049639 P 26 049684 P 26
049713 P 27 058835 P 32 062623 P 34 064728 P 35
064734 P 37 064748 P 39 064778 P 44 067165 P 49

MUTATION
040787 P 17 065659 P 48

N-POWER, SAFETY OF
044015 P 21 044109 P 21 065195 P 46 065420 P 47

NBS
064780 P 45

NCRP
043979 P 20 044015 P 21 065296 P 47 067088 P 49

NEPTUNIUM
049527 P 24

NEUTRON
019434 P 10

NEVADA TEST SITE
061931 P 33

NEWBORN
056179 P 31

NOBLE GAS
075576 P 53 083078 P 57

NORWAY
007862 P 5

NRC QUESTION
038641 P 16

NUCLEAR ATTACK
082319 P 55

NUCLEAR DETONATION
002551 P 1 016916 P 9 041584 P 17 075915 P 53
077191 P 54 082319 P 55 083078 P 57

NUCLEAR EXPLOSION DEBRIS
016916 P 9

OBSERVED RATIO
064742 P 39 064769 P 42

OCEAN AND SEA
057579 P 32 077309 P 54

OFF SITE
002551 P 1

OPERATING EXPERIENCE
043122 P 18 043571 P 20 048419 P 23

OPPONENT
043979 P 20

ORGAN
017134 P 10 060933 P 33 064737 P 38 064743 P 39
067165 P 49

ORGAN, OTHER
064778 P 44

ORGANIC

049517 P 23 049533 P 24 049550 P 24 049586 P 25
049600 P 25 049714 P 27 051407 P 28 058835 P 32
062623 P 34 064730 P 36 064733 P 37 064734 P 37
064766 P 41 064769 P 42 064772 P 42 064777 P 44
064778 P 44 064780 P 45 064782 P 45 064784 P 45
065253 P 47 067136 P 49
ORGANIZATION, CITIZEN
056410 P 31
ORGANIZATION, INTERNATIONAL
065198 P 47 075576 P 53
ORNL
021935 P 11
OVARY
049585 P 24
OXIDATION
028579 P 14 062726 P 35
OXIDE
043091 P 18 049533 P 24 049605 P 25 049639 P 26
049684 P 26 049700 P 26 049711 P 27 049712 P 27
051628 P 29 056159 P 31 056179 P 31 062587 P 34
062623 P 34 064725 P 35 064727 P 35 064728 P 35
064729 P 36 064731 P 36 064732 P 37 064733 P 37
064749 P 40 064753 P 40 064766 P 41 064767 P 41
064768 P 41 064769 P 42 064772 P 42 064773 P 42
064774 P 43 064775 P 43 064776 P 43 064777 P 44
064778 P 44 067088 P 49 067136 P 49 067165 P 49
075281 P 52 077199 P 54
PANCREAS
062623 P 34 064743 P 39
PARTICLE SIZE DISTRIBUTION
007422 P 3
PATHOLOGY
045597 P 22 049527 P 24 049600 P 25 064753 P 40
077199 P 54
PERIODICITY, SEASONAL
076703 P 53
PERSONNEL EXPOSURE, RADIATION
006241 P 1 006997 P 2 007399 P 3 007411 P 3
007420 P 3 007507 P 4 007577 P 4 007862 P 5
008999 P 6 009022 P 6 009025 P 6 009302 P 7
010561 P 7 011919 P 7 014080 P 8 015081 P 8
015083 P 8 015084 P 9 016916 P 9 017335 P 10
026087 P 12 037466 P 16 048519 P 23 049197 P 23
049550 P 24 049605 P 25 049700 P 26 049702 P 26
049711 P 27 056158 P 30 056159 P 31 061931 P 33
062563 P 33 062587 P 34 064725 P 35 064727 P 35
064729 P 36 064730 P 36 064732 P 37 064749 P 40
064767 P 41 064768 P 41 064774 P 43 064779 P 44
064780 P 45 064782 P 45 064784 P 45 065162 P 46
067088 P 49 067136 P 49 071195 P 51 075523 P 52
080838 P 55 082354 P 56
PERSONNEL PROTECTIVE DEVICE
003269 P 1 007577 P 4 066510 P 49 075523 P 52
PHOSPHORUS
007420 P 3 007852 P 5 007862 P 5 065198 P 47
PHYSICOCHEMICAL FORM
049600 P 25 064730 P 36 064780 P 45 064782 P 45
064784 P 45 077143 P 54
PHYSIOLOGY/METABOLISM
045597 P 22 049517 P 23 049527 P 24 049533 P 24
049550 P 24 049585 P 24 049586 P 25 049600 P 25
049605 P 25 049639 P 26 049684 P 26 049700 P 26
049702 P 26 049711 P 27 049712 P 27 049713 P 27
049714 P 27 056158 P 30 056159 P 31 056179 P 31
058835 P 32 061912 P 32 062563 P 33 062587 P 34
062623 P 34 064725 P 35 064727 P 35 064728 P 35
064729 P 36 064730 P 36 064731 P 36 064732 P 37
064733 P 37 064734 P 37 064737 P 38 064740 P 38
064741 P 38 064742 P 39 064743 P 39 064747 P 39
064748 P 39 064749 P 40 064753 P 40 064759 P 40
064766 P 41 064767 P 41 064768 P 41 064769 P 42
064772 P 42 064773 P 42 064774 P 43 064775 P 43
064776 P 43 064777 P 44 064778 P 44 064779 P 44
064780 P 45 064782 P 45 064784 P 45 064785 P 46
066272 P 48 066331 P 48 067088 P 49 067136 P 49
067165 P 49 071505 P 52
PLACENTA
049527 P 24 049639 P 26 077199 P 54
PLACENTAL TRANSFER
049527 P 24
PLANT
064737 P 38
PLASTICS
066272 P 48
PLOWSHARE
002551 P 1 021935 P 11 027868 P 13 041584 P 17
075915 P 53 077191 P 54
PLUTONIUM
007363 P 2 007411 P 3 007420 P 3 007422 P 3
007430 P 4 007790 P 5 007852 P 5 007862 P 5
008708 P 6 008806 P 6 013658 P 8 024425 P 12
026493 P 12 049527 P 24 066331 P 48 066510 P 49
070413 P 51 077017 P 53 082319 P 55
POLLUTION
065195 P 46 075576 P 53
POLLUTION IN PERSPECTIVE
077309 P 54
POLONIUM
007852 P 5 043091 P 18
POPULATION EXPOSURE
007226 P 2 007411 P 3 013658 P 8 013758 P 8
017134 P 10 027868 P 13 028579 P 14 030135 P 15
031396 P 15 038641 P 16 041584 P 17 061130 P 33
064759 P 40 064768 P 41 064776 P 43 064785 P 46
065420 P 47 066272 P 48 067088 P 49 071194 P 51
077017 P 53 077143 P 54 080838 P 55 082780 P 56
083078 P 57
POTASSIUM
013758 P 8 019434 P 10 051998 P 29 062687 P 34
POWER FUNCTION
064773 P 42
POWER PLANT, NUCLEAR
080838 P 55
PREGNANT
049527 P 24 049533 P 24 049639 P 26
PROCEDURES AND MANUALS
082792 P 56
PRODUCTION
077191 P 54
PROMETHIUM
020666 P 10
PROPERTY, CHEMICAL
077199 P 54
PROPERTY, PHYSICAL
064731 P 36 075281 P 52
PROPONENT
044015 P 21 044109 P 21
PROTACTINIUM
007852 P 5
PROTEIN
040785 P 17 040787 P 17 064733 P 37 064734 P 37
064742 P 39 064766 P 41
QUALITY ASSURANCE
077199 P 54
R AND D PROGRAM
026493 P 12
RADIATION DAMAGE
024425 P 12 082319 P 55
RADIATION EFFECT
002551 P 1 013658 P 8 024425 P 12 037466 P 16
040787 P 17 041900 P 17 043091 P 18 043103 P 18
045018 P 22 052315 P 29 056410 P 31 065122 P 46
065195 P 46 065420 P 47 065659 P 48 066331 P 48
077017 P 53 077191 P 54 077199 P 54 082319 P 55
RADIATION EXPOSURE
051403 P 28 051407 P 28 051408 P 28 052834 P 29
053130 P 30 065195 P 46 065296 P 47 066331 P 48
070395 P 50 077017 P 53 077199 P 54 082319 P 55
RADIATION EXPOSURE, ACUTE
043246 P 19 070396 P 50
RADIATION EXPOSURE, CHRONIC
041584 P 17 065122 P 46 066272 P 48 070396 P 50
RADIATION IN PERSPECTIVE
043122 P 18 044015 P 21 044109 P 21 057579 P 32
070395 P 50
RADIATION INJURY TREATMENT
082319 P 55
RADIATION MODEL
027868 P 13 064740 P 38
RADIATION MONITORS
024143 P 12 066272 P 48 066510 P 49
RADIATION PROTECTION, ORGANIZATION
006997 P 2 007363 P 2 007577 P 4 020666 P 10
021754 P 11 028925 P 14 031396 P 15 040379 P 17
RADIATION SAFETY AND CONTROL
003269 P 1 007363 P 2 007507 P 4 007577 P 4
013658 P 8 016916 P 9 017118 P 9 021754 P 11
025635 P 12 027860 P 13 027977 P 13 028925 P 14
030135 P 15 040379 P 17 043122 P 18 043571 P 20
048519 P 23 061931 P 33 065195 P 46 065198 P 47
065420 P 47 066510 P 49 075523 P 52 082305 P 55
082792 P 56 082793 P 56
RADIATION UNIT
007577 P 4 024425 P 12
RADIATION, PUBLIC EDUCATION
064776 P 43 064780 P 45
RADIOACTIVITY RELEASE
043213 P 19 043979 P 20 044015 P 21 044109 P 21
045018 P 22 048419 P 23 065198 P 47 065253 P 47
065296 P 47 065420 P 47 067941 P 50 070395 P 50
071195 P 51 072960 P 52 077017 P 53 077191 P 54
080838 P 55 082319 P 55 082780 P 56

RADIOBIOLOGY
002551 P 1 020666 P 10 021995 P 11 043103 P 18
045597 P 22 049517 P 23 049712 P 27 049714 P 27
072215 P 52
RADIOCHEMICAL ANALYSIS
007411 P 3 007422 P 3 007507 P 4
RADIOCHEMICAL PLANT SAFETY
020666 P 10
RADIOGRAPHY
065198 P 47
RADIOISOTOPE
026087 P 12 031396 P 15 043091 P 18 044674 P 21
051573 P 29 065198 P 47 070413 P 51
RADIOLOGICAL ASSISTANCE
031065 P 15 077143 P 54 082305 P 55 082793 P 56
RADIOLOGY
019434 P 10 025635 P 12 045597 P 22 052303 P 29
064731 P 36
RADIONUCLIDE TRANSFER
043246 P 19 044674 P 21 051573 P 29
RADIONUCLIDE UPTAKE
043153 P 19 043593 P 20 044471 P 21 049517 P 23
049527 P 24 049533 P 24 049550 P 24 049585 P 24
049586 P 25 049600 P 25 049605 P 25 049639 P 26
049684 P 26 049700 P 26 049702 P 26 049711 P 27
049712 P 27 049713 P 27 049714 P 27 051967 P 29
054914 P 30 056158 P 30 056159 P 31 056179 P 31
057579 P 32 058835 P 32 061130 P 33 061721 P 33
062563 P 33 062587 P 34 062623 P 34 064725 P 35
064727 P 35 064728 P 35 064729 P 36 064730 P 36
064731 P 36 064732 P 37 064733 P 37 064734 P 37
064737 P 38 064740 P 38 064741 P 38 064742 P 39
064743 P 39 064747 P 39 064748 P 39 064749 P 40
064753 P 40 064759 P 40 064766 P 41 064767 P 41
064768 P 41 064769 P 42 064772 P 42 064773 P 42
064774 P 43 064775 P 43 064776 P 43 064777 P 44
064778 P 44 064779 P 44 064780 P 45 064782 P 45
064784 P 45 064785 P 46 066272 P 48 067088 P 49
067136 P 49 067165 P 49 075576 P 53
RADIONUCLIDE, INDUCED
066331 P 48
RADIOPHARMACEUTICAL
049517 P 23 049586 P 25 049600 P 25 062623 P 34
077017 P 53
RADIOSENSITIVITY
072215 P 52
RADIUM
007411 P 3 007420 P 3 007461 P 4 007790 P 5
007852 P 5 019434 P 10 020666 P 10 062687 P 34
064730 P 36 065296 P 47 066331 P 48 071195 P 51
RADON
007411 P 3 007790 P 5 048419 P 23 062687 P 34
RAINOUT
004672 P 1 061721 P 33
RANGE EXTENSION
064731 P 36
RARE EARTH
007411 P 3
RBE
049711 P 27 049712 P 27 049714 P 27 062587 P 34
064727 P 35 064740 P 38 067136 P 49 067165 P 49
077199 P 54
REACTOR
007430 P 4 043122 P 18 044471 P 21
REACTOR COOLANT
037466 P 16
REACTOR POWER
007226 P 2 044015 P 21 044109 P 21 048419 P 23
REACTOR SAFETY SYSTEM
030135 P 15 056159 P 31
REACTOR, GCR
004672 P 1
REACTOR, HWR
003269 P 1 016512 P 9 021995 P 11 027977 P 13
REACTOR, POWER
037466 P 16 043979 P 20 045018 P 22 056410 P 31
065122 P 46 075523 P 52 077017 P 53 077191 P 54
REACTOR, PRODUCTION
044674 P 21
REACTOR, PWR
038641 P 16
REACTOR, RESEARCH
016512 P 9
REACTOR, THERMONUCLEAR
082319 P 55
RECOVERY
052834 P 29
REGULATION
007363 P 2 007577 P 4 049197 P 23 072960 P 52
082792 P 56
REGULATION, STATE
065195 P 46
REPORT, SAR
004672 P 1 016512 P 9
RESOURCE, NATURAL
075915 P 53 077143 P 54 083078 P 57
RESPIRATION
043100 P 18 064727 P 35 064732 P 37 064776 P 43
064782 P 45
RESPONSE TO NRC QUESTION
016512 P 9
RESUSPENSION
007422 P 3
RETENTION
043593 P 20 071505 P 52
RETENTION FUNCTION
049600 P 25 049605 P 25 049684 P 26 049700 P 26
058835 P 32 062563 P 33 062623 P 34 064747 P 39
064773 P 42 064775 P 43 064777 P 44 064778 P 44
067165 P 49
REVIEW
049585 P 24 049700 P 26 049711 P 27 049712 P 27
049714 P 27 056158 P 30 062587 P 34 064731 P 36
064732 P 37 064733 P 37 064734 P 37 064740 P 38
064753 P 40 064759 P 40 064766 P 41 064767 P 41
064774 P 43 064777 P 44 064778 P 44 067088 P 49
067136 P 49
RIVER
057579 P 32
RIVER, CLINCH
013658 P 8
RIVER, SAVANNAH
070544 P 51
RNA
040787 P 17 064737 P 38 064742 P 39 064743 P 39
ROCK MECHANICS
021935 P 11
RUBIDIUM
013758 P 8
RUTHENIUM
007862 P 5 013658 P 8 065420 P 47 082319 P 55
SAFETY ANALYSIS
043571 P 20
SAFETY EVALUATION
021935 P 11 067964 P 50 070413 P 51 077309 P 54
SAFETY PRINCIPLES AND PHILOSOPHY
066510 P 49
SAFETY REVIEW
043122 P 18
SAMPLING
006867 P 2 007363 P 2 007422 P 3 007430 P 4
007577 P 4 007852 P 5 011635 P 7 043571 P 20
061931 P 33 066510 P 49 067941 P 50 082354 P 56
SAVANNAH RIVER PLANT
007677 P 5 023261 P 11 031065 P 15 031417 P 15
044674 P 21 049713 P 27 056158 P 30 064767 P 41
064768 P 41
SHIELDING
007430 P 4
SITING, REACTOR
064776 P 43
SKIN
042771 P 18 043100 P 18 049639 P 26 049711 P 27
051406 P 28 051407 P 28 051628 P 29 056159 P 31
061721 P 33 062587 P 34 062623 P 34 064727 P 35
064728 P 35 064732 P 37 064734 P 37 064778 P 44
065253 P 47 065935 P 48 075281 P 52 075523 P 52
077309 P 54 082319 P 55
SOCIO/PHILOSOPHICAL CONSIDERATION
043979 P 20 070395 P 50 072960 P 52 077191 P 54
082319 P 55
SODIUM
008806 P 6 013758 P 8 043246 P 19 051998 P 29
SOIL
082780 P 56
SOIL PROPERTY
007507 P 4
SOIL, NUCLIDE OCCURRENCE
007422 P 3 016916 P 9
SOIL, RADIONUCLIDE MOVEMENT THROUGH
021935 P 11
SOLID
064730 P 36
SOLID STATE DEVICE
031061 P 15
SOLUBILITY
049585 P 24 049711 P 27
SORPTION
021935 P 11 027977 P 13 028491 P 13
SOURCE, RADIATION
082305 P 55
SOUTH AFRICA

040379 P 17 061130 P 33
SPECIFIC ACTIVITY
064731 P 36 064777 P 44
SPECTROMETRY, ALPHA
007422 P 3 007507 P 4
SPECTROMETRY, GAMMA
007422 P 3 007430 P 4 007507 P 4
SPERM
064741 P 38
SPERT 1 (S-RR)
007507 P 4
SPLEEN
049533 P 24 049586 P 25 049600 P 25 049713 P 27
058835 P 32 062623 P 34 064728 P 35 064734 P 37
064748 P 39
SPOKESMAN, ACADEMIC
056410 P 31
SPOKESMAN, AEC
044015 P 21 045018 P 22 056410 P 31 065420 P 47
SPOKESMAN, FEDERAL
065195 P 46 065296 P 47
SPOKESMAN, UTILITY
044109 P 21
STACK
004672 P 1 008708 P 6 067941 P 50
STATEMENT, ENVIRONMENTAL
083078 P 57
STATISTICAL FLUCTUATION
064730 P 36
STEROID
049517 P 23 049586 P 25 067136 P 49
STIMULATION
077143 P 54 083078 P 57
STOMACH
064748 P 39 064778 P 44
STRONTIUM
007226 P 2 007411 P 3 007420 P 3 007422 P 3
007507 P 4 007790 P 5 007852 P 5 007862 P 5
008708 P 6 008806 P 6 013658 P 8 019434 P 10
020666 P 10 041584 P 17 043979 P 20 049527 P 24
061130 P 33 065296 P 47 065420 P 47 066272 P 48
066331 P 48 077017 P 53 082319 P 55
SULFUR
007420 P 3 007852 P 5 065198 P 47
SURFACE CONTAMINATION
024425 P 12 083078 P 57
SURFACE WATER, NUCLIDE OCCURRENCE
007862 P 5 016916 P 9
SURFACE WATER, SEDIMENT
007862 P 5
SURVEY
065195 P 46
SURVEY, EMERGENCY
007577 P 4
SURVEY, ENVIRONMENT
007507 P 4 007862 P 5
SURVEY, RADIATION
043571 P 20
SURVEY, USPHS
064779 P 44 064780 P 45
SYSTEM ANALYSIS
075576 P 53
SYSTEM DESCRIPTION
043571 P 20
TELEVISION
043306 P 20
TEMPERATURE
043273 P 19 049702 P 26 056158 P 30 064767 P 41
065659 P 48
TEST, LEAK RATE
082305 P 55
TEST, WEAPONS
077191 P 54 082319 P 55
TESTING
002551 P 1 043571 P 20 051314 P 28 061931 P 33
TESTIS
049533 P 24 049585 P 24 049586 P 25 049600 P 25
049684 P 26 058835 P 32 061130 P 33 062623 P 34
064734 P 37 064741 P 38 064778 P 44 077017 P 53
THEORETICAL INVESTIGATION
030135 P 15
THERAPY
040379 P 17 043091 P 18 048419 P 23 065198 P 47
077017 P 53
THERMAL CONSIDERATION
064727 P 35
THERMAL POLLUTION
044471 P 21 056410 P 31 065420 P 47
THORIUM
007363 P 2 007790 P 5 007852 P 5
THORON
062687 P 34
THYMIDINE
049586 P 25 049714 P 27 051967 P 29 051968 P 29
052834 P 29 052906 P 30 054639 P 30 058835 P 32
061912 P 32 064733 P 37 064734 P 37 064737 P 38
064740 P 38 064741 P 38 064742 P 39 064743 P 39
064747 P 39 064748 P 39 064749 P 40 064753 P 40
064759 P 40 064772 P 42 067136 P 49
THYMUS
049533 P 24 049586 P 25 054897 P 30 062623 P 34
064728 P 35 064743 P 39
THYROID
049600 P 25 064778 P 44
TITANIUM
052303 P 29
TOXICITY
017134 P 10 040785 P 17 049586 P 25 049639 P 26
049714 P 27 058835 P 32 062587 P 34 062623 P 34
064728 P 35 064733 P 37 064734 P 37 064740 P 38
064741 P 38 064753 P 40 064759 P 40 064772 P 42
064777 P 44 072215 P 52
TRACE ELEMENT
066272 P 48
TRACER
051582 P 29
TRACER, RADIOACTIVE
043103 P 18 044224 P 21
TRACHEA
049585 P 24
TRANSFER FUNCTION
044224 P 21
TRANSPORTATION AND HANDLING
061931 P 33 065198 P 47
TRANSURANIUM ELEMENT
049527 P 24
TROPOSPHERE
082319 P 55
TUMOR
049714 P 27 051967 P 29 066331 P 48 077199 P 54
TURNOVER RATE
017134 P 10 043103 P 18 043593 P 20 044224 P 21
051582 P 29 064777 P 44
UNITED KINGDOM
007461 P 4 007852 P 5 019434 P 10 020666 P 10
064730 P 36 064782 P 45 064784 P 45 067136 P 49
UNITED STATES
045385 P 22 064780 P 45
URANIUM
007411 P 3 007430 P 4 007790 P 5 007852 P 5
007862 P 5 008806 P 6 024425 P 12 040379 P 17
048419 P 23 070413 P 51 077017 P 53 082319 P 55
USSR
062587 P 34
UTERUS
049527 P 24 049639 P 26
VARIABILITY
056158 P 30 064767 P 41 064779 P 44 064782 P 45
VEGETATION
007862 P 5 021935 P 11 051314 P 28 064785 P 46
VENTILATION SYSTEM
004672 P 1 015081 P 8 015084 P 9 026087 P 12
WASTE DISPOSAL
007363 P 2 007430 P 4 009022 P 6 013658 P 8
037466 P 16 061931 P 33 066510 P 49 075576 P 53
WASTE DISPOSAL, ATMOSPHERIC
057580 P 32 061721 P 33
WASTE DISPOSAL, ECONOMICS
013658 P 8 030135 P 15
WASTE DISPOSAL, GAS
007507 P 4 021935 P 11
WASTE DISPOSAL, HYDRAULIC FRACTURING
013658 P 8 021935 P 11 030135 P 15
WASTE DISPOSAL, LIQUID
007507 P 4 007862 P 5
WASTE DISPOSAL, SALT
013658 P 8 021935 P 11 030135 P 15
WASTE DISPOSAL, SOLID
007507 P 4
WASTE DISPOSAL, TERRESTRIAL
007507 P 4 013658 P 8 021935 P 11 030135 P 15
WASTE HEAT, WATER
056410 P 31
WASTE MANAGEMENT
007507 P 4 021935 P 11 030135 P 15 065195 P 46
065420 P 47
WASTE STORAGE
007507 P 4 021935 P 11 061931 P 33 065195 P 46
WASTE TREATMENT
044674 P 21 066272 P 48 077191 P 54
WATER
042771 P 18 043103 P 18 043197 P 19 043246 P 19

043593 P 20 044224 P 21 049550 P 24 049605 P 25
051405 P 28 051573 P 29 051998 P 29 054639 P 30
056179 P 31 061912 P 32 062563 P 33 062587 P 34
062623 P 34 064727 P 35 064731 P 36 064733 P 37
064747 P 39 064749 P 40 064766 P 41 064768 P 41
064774 P 43 064777 P 44 064778 P 44 065122 P 46
065162 P 46 067088 P 49 067165 P 49 071505 P 52
077199 P 54 082305 P 55

WATER POLLUTION
043979 P 20 045018 P 22 075576 P 53 077017 P 53
082780 P 56

WATER VAPOR
036557 P 16 062726 P 35 070396 P 50 082305 P 55

WATER, DRINKING
007507 P 4 043273 P 19 049684 P 26 056158 P 30
057580 P 32 061721 P 33 064731 P 36 064732 P 37
064779 P 44 064785 P 46 065122 P 46 067088 P 49
070544 P 51 071194 P 51

WEEK
064730 P 36 064747 P 39

WHOLE BODY
043103 P 18 043197 P 19 043593 P 20 049586 P 25
049700 P 26 056158 P 30 056159 P 31 056179 P 31
062563 P 33 062623 P 34 062687 P 34 064730 P 36
064766 P 41 064767 P 41 064773 P 42 064775 P 43
064777 P 44 064779 P 44 070413 P 51 077309 P 54
080838 P 55

X-RAY
007430 P 4 024425 P 12 040379 P 17 065198 P 47
077017 P 53

XENON
008708 P 6 049585 P 24 066272 P 48 080838 P 55

YEAR
049550 P 24 064779 P 44

YOUNG
045384 P 22 056179 P 31 064776 P 43

ZINC
013758 P 8 051573 P 29 064773 P 42 065420 P 47

ZIRCONIUM
082319 P 55

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

ADAIR B
017335 P 10
ALBENESIUS EL
064768 P 41
AMAVIS RJ
075576 P 53
ANDERSON EC
051403 P 28
ANSPAUGH LR
002551 P 1 070396 P 50
APPLEBY A
077199 P 54
BAIR WJ
066331 P 48
BALLEREAU P
062726 P 35
BARBER DE
061912 P 32
BARRY PJ
007226 P 2 064776 P 43
BARTON CJ
055111 P 30
BASERGA R
051967 P 29
BASSHAM JA
043197 P 19
BASSON JK
040379 P 17 061130 P 33
BATEMAN AJ
051968 P 29
BEACH VL
049517 P 23
BENNETT BG
071505 P 52
BERLIN A
075576 P 53
BERNARD SR
049605 P 25
BIGLER WA
062563 P 33
BIRO T
064729 P 36
BITTEL, R
057579 P 32
BLOCK S
007430 P 4
BOLING EA
051998 P 29
BOND VP
017134 P 10 044015 P 21 049714 P 27
BRETTHAUER EW
076703 P 53
BRUNNER H
064731 P 36 064732 P 37
BULDAKOV LA
049527 P 24
BUSH WR
019535 P 10 021995 P 11 027860 P 13 064725 P
075523 P 52
BUSTAD LK
066331 P 48
BUTLER GC
064775 P 43
BUTLER GG
064774 P 43
BUTLER HL
007677 P 5 043273 P 19 056158 P 30 064767 P
BUTLER HM
055111 P 30 061931 P 33
BUTLER RE
049702 P 26
CAHILL DF
049533 P 24 065122 P 46
CARGILL DI
049517 P 23
CARTER MW
049197 P 23 064779 P 44 064780 P 45 065162 P
076703 P 53 077191 P 54
CHASSANY J
043122 P 18
CHEW MH
082793 P 56
CHIPPERFIELD B
049600 P 25
CHIRKOVA EN
067165 P 49
CHISWELL WO
036557 P 16 064782 P 45
CLIFTON RJ
062623 P 34
COHEN JJ
070395 P 50 072960 P 52
COLVIN MC
047898 P 22 065935 P 48
COMBET M
075915 P 53
COOGAN JS
082354 P 56
COOLEY RC
027977 P 13
CORBISIER C
043213 P 19
COWPER G
006997 P 2 011919 P 7
COWSER KE
016916 P 9
CRAIG DK
040379 P 17
CROACH JW
077833 P 55
CRONKITE EP
064741 P 38 064747 P 39 064748 P 39 064759 P 4
CUMMING RB
055111 P 30
CZIBOLY C
064729 P 36
DANCER GHC
064782 P 45
DAUCER GHC
036557 P 16
DAVIS CW
066331 P 48
DELONG CW
051628 P 29
DENHAM DH
031061 P 15
DEWEY WC
054639 P 30 064772 P 42
DIETHORN WS
077309 P 54
DIETRICH E
021754 P 11 028925 P 14
DOLPHIN GW
007420 P 3 008806 P 6 049700 P 26
DOREMUS DR
029671 P 14
DROBINSKI JC
064785 P 46
DUMMER JE
007577 P 4
EAKINS JD
028491 P 13
EGOROVA TM
049527 P 24
EISENBUD M
080838 P 55 082319 P 55
EVANS AG
023261 P 11 031417 P 15 049713 P 27
EVERS J
043103 P 18
FEINENDEGEN LE
040785 P 17 040787 P 17 049714 P 27
FISH BR
049605 P 25
FITZSIMMONS CK
071195 P 51
FLIEDNER TM
064747 P 39 064759 P 40
FORD MR
049605 P 25
FUJIMOTO GI
049517 P 23
FURCHNER J
054914 P 30
FURCHNER JE
013758 P 8 064773 P 42
GAGNON WF
077199 P 54
GERARD R
075915 P 53

GEY A
028579 P 14
GIBSON JA
007399 P 3
GIBSON JAB
052303 P 29
GOLDIN AS
064785 P 46
GOODHEART CR
052315 P 29
GOSNELL E
049517 P 23
GROOT-WESSELDIJK A
043306 P 20
GROVE GR
062563 P 33
GUDIKSEN PH
067941 P 50
GUILD WR
064749 P 40
HACKE J
048419 P 23
HARLEY JH
007790 P 5
HAYWOOD FF
061931 P 33
HEALY JW
066510 P 49
HETHERINGTON NW
066331 P 48
HIGGINS GH
070395 P 50 072960 P 52
HOFER KG
072215 P 52
HUGHES WL
072215 P 52
HULL A
045018 P 22
HUMPHEREY RM
064772 P 42
HUTCHIN ME
006241 P 1 008999 P 6
HUTCHINSON WP
028491 P 13
ISTOMINA AG
049639 P 26
JACKSON S
007420 P 3 007852 P 5 008806 P 6 049700 P
JACOBI W
048419 P 23
JAEGER RG
065198 P 47
JOHNSON HA
064741 P 38 064753 P 40
JOHNSTON JE
019434 P 10 045597 P 22
JONES BA
064772 P 42
JONES HG
007461 P 4 064730 P 36
JUNGAS RL
064769 P 42
JUNKINS RL
044674 P 21
KARP W
009022 P 6
KATHREN RL
007430 P 4 031061 P 15
KAUFMAN SL
065935 P 48
KAYE SV
016916 P 9 027868 P 13 041584 P 17
KELLER S
064748 P 39
KELLY MJ
077143 P 54
KILLIAN CB
009302 P 7
KILLMANN SA
064759 P 40
KINDEKEN CL
007430 P 4
KING EJ
064743 P 39
KNIGHT GB
011919 P 7 017335 P 10
KOENIG LA
028925 P 14
KONIG LA
008708 P 6 021754 P 11
KORANDA JJ
067964 P 50 070396 P 50
KOZOLL DD
056179 P 31
KUBOSE DA
007390 P 2
KUSIAN R
007430 P 4
LAGATTA DP
064785 P 46
LAJTHA LG
064740 P 38
LAMBERT BE
007461 P 4 048519 P 23 062623 P 34 064730 P 3
LANGHAM WH
043593 P 20 044224 P 21 064727 P 35 064728 P 3
064773 P 42
LARSON CE
044471 P 21
LASSEN NA
049585 P 24
LE GRAND J
061721 P 33
LE GRAND, J
057580 P 32
LEROY JH
007677 P 5 043273 P 19 064767 P 41
LIEBERMAN R
045384 P 22 065162 P 46 065935 P 48 070544 P 5
071194 P 51
LISTER BA
008806 P 6 026493 P 12
LONG C
064743 P 39
LOUGH SA
062687 P 34
LYAGINSKAYA AM
049527 P 24 049639 P 26
LYON RJ
045385 P 22
MARTIN JR
067964 P 50 070396 P 50
MARTIN R
065659 P 48
MAUSHART R
029220 P 14 031396 P 15
MAYS MG
066331 P 48
MCCLELLAN RO
066331 P 48
MCKOWN DA
004650 P 1
MCLENDON JD
007363 P 2
MCMILLAN RC
065935 P 48
MCNELIS ON
071195 P 51
MCREE PC
007363 P 2
MELI A
049517 P 23
MERIWETHER
029671 P 14
MEYER KA
056179 P 31
MIGHISSI AA
064779 P 44
MINDER W
060933 P 33
MOEHRLE G
070413 P 51
MOGHISSI AA
045384 P 22 045385 P 22 047898 P 22 049197 P 2
064780 P 45 065162 P 46 065935 P 48 070544 P 5
071194 P 51 076703 P 53 077191 P 54
MOGHISSIS AA
065253 P 47
MORECRAFT WT
003269 P 1
MOSER MH
043246 P 19
MOSKALEV JI
049527 P 24
MOSKALEV YI
043091 P 18 062587 P 34 075281 P 52
MUIR JR
049605 P 25
MYERS DS
067941 P 50

O BRIEN HG
029671 P 14
OCKEY CH
041900 P 17
OLIVER R
064740 P 38
OSBORNE RV
042771 P 18 056159 P 31 067088 P 49
OVCHARENKO EP
049527 P 24
PATZER RG
049684 P 26 065253 P 47
PENELLE G
043213 P 19
PETERSON KR
083078 P 57
PINSON EA
044224 P 21 051404 P 28 051405 P 28 051406 P
051407 P 28 051408 P 28 064727 P 35 064728 P
PLAMONDON JE
043197 P 19
PLANET J
061721 P 33
PLANET, J
057580 P 32
POSEY CD
049197 P 23 064780 P 45
PUECHL KH
009025 P 6
QUASTEL MR
052834 P 29
RACHMELER M
053555 P 30
RADFORD EP
043979 P 20
RARRICK HL
024143 P 12
RAY JW
037466 P 16
REGNIER JF
049197 P 23 064780 P 45
REHNBERG BF
047898 P 22 065935 P 48
REINIG WC
031065 P 15 049550 P 24
REINING WC
064768 P 41
REYNOLDS BM
049517 P 23
RICHMOND CR
013758 P 8 043593 P 20 051573 P 29 064773 P
066331 P 48
ROBINSON DW
043246 P 19
ROBINSON WL
002551 P 1
ROBISON WL
070396 P 50
ROHWER PS
016916 P 9 027868 P 13 041584 P 17 055111 P
077143 P 54 082780 P 56
ROSENBLATT LS
066331 P 48
ROUX JM
043122 P 18
ROWE PC
011919 P 7
ROWLAND RE
066331 P 48
RUBINI JR
064748 P 39 064759 P 40
RUNINI JR
064747 P 39
SAMUELS LD
052906 P 30
SANDERS SM
031065 P 15 049550 P 24
SAWYER B
064737 P 38
SCHIEFERDECKER H
070413 P 51 082305 P 55
SCHIMMELFENNIG V
007430 P 4
SCHLOERG PR
043246 P 19
SEREBRYAKOV NG
067165 P 49
SHAW EI
058835 P 32
SHTUKKENBERG YM
043100 P 18 062587 P 34
SILVER WJ
082793 P 56
SIMPSON JW
056410 P 31
SIRI W
043103 P 18
SLATER TF
064737 P 38
SMEETS JGPM
075576 P 53
SMITH TE
064766 P 41
SNYDER WS
016916 P 9 049605 P 25
SOUDAIN G
011635 P 7
SPALDING JF
051314 P 28
SPERRY WM
064743 P 39
STEINETZ BG
049517 P 23
STOCKHO WL
077309 P 54
STRAULI U
064737 P 38
STRUXNESS EG
016916 P 9
TAYLOR NA
007852 P 5
TAYLOR RT
064766 P 41
TERRILL JG
064785 P 46
THIE JA
043571 P 20
THOMPSON RC
051582 P 29 064777 P 44 064778 P 44
TINNEY JF
067941 P 50
TOERBER ED
049197 P 23 064780 P 45
TRUJILLO TT
043593 P 20 051402 P 28
UDEKWU FAO
056179 P 31
UNRUH CM
082792 P 56
UZZAN G
061721 P 33
UZZAN, G
057580 P 32
VAN AS D
040379 P 17
VAN DER MERWE CJ
040379 P 17
VANAS D
061130 P 33
VANDERWESTHUSIZEN
061130 P 33
VAUBERT, B
057579 P 32
VAUGH HA
010561 P 7
VAUGHAN BE
006241 P 1 008999 P 6
VENNART J
020666 P 10 025635 P 12 048519 P 23 049586 P 2
049712 P 27 054534 P 30 064784 P 45 067136 P 4
VERLY WG
064733 P 37 064734 P 37
VLEGGAAR CM
061130 P 33
WADE L
058835 P 32
WATTS JR
006867 P 2
WEST CM
007363 P 2
WHEELER JK
047898 P 22
WHITTON JT
049711 P 27
WIMBER DE
053130 P 30
WOOD L
064748 P 39
WORMAN FCV
054897 P 30

WRUBLE DT
071195 P 51
WYLIE KF
062563 P 33
YUILE CL
049533 P 24
ZEHME S
008708 P 6
ZHURAVLEV VF
043100 P 18 062587 P 34

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN TIE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE. *INDICATES END OF TITLE.)

EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS* #CHROMATID
WATER AND COBALT-60 GAMMA RAYS IN INCUCING CHROMOSOMAL
WATER, AND COBALT-60 GAMMA RAYS IN INDUCING CHRCMOSOMAL
CLINICAL USE OF RADIOACTIVE INERT GASES, WITH EXAMPLES OF
#THF POSSIBLE RADIOLOGICAL HAZARDS FRCM TRITIUM SOURCES
#THE POSSIBLF RADIOLOGICAL HAZARDS FRCM TRITIUM SOURCES
DILUTION VOLUME OF MAN.* #THE
MAN.* #
#PERCUTANEOUS
#TRITIUM LABORATORY - STUDY OF THE MAXIMUM POSSIBLE
IN FRENCH)* #TRITIUM AND TRITATED WATER- TIME LIMITS OF
MONITORING* #
DOSES RESULTING FROM ADMINISTRATION CF TRITIATED FOLIC
WATER (T7599)* #FATTY
FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC
OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO
#TRANSFER OF WATER AND ELECTROLYTES
A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ INACTIFS DU
RADIONUCLIDE TRANSFER THROUGH THE PLACENTA ANC THEIR BIOL
TO THE DOSIMETRY OF TRITIUM IN THE PRESENCE OF INACTIVE OR
PLANT. II* #THE MAXIMUM PERMISSIBLF
CONSIDERATICNS OF ACUTE EXPOSURE OF MAN TO HTO OR T*2*O
#TRITIUM
AND FAT OF MAN FCLLCWING EIGHT MONTHS# #THE SPECIFIC
ATMOSPHERIC ENVIRONMENT.* #THEORETICAL CONSIDERATIONS OF
#A THEORETICAL CONSIDERATION OF THE HAZARDS ASSOCIATED WITH
#RADIATION DOSE DUE TO
#FATTY ACID SYNTHESIS IN
#INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL
IN THE RAT* #RADIATION DOSES RESULTING FROM
#TISSUE DOSES FROM CHRONIC
#CONCENTRATIONS MAXIMALES
#CONCENTRATIONS MAXIMALES
CLIFFS NUCLEAR POWER PLANTS* #
#
#RADIOACTIVE FALLOUT OVER SOUTH
#INCORPORATION OF TRITIATED THYMIDINE INTO DNA
#RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS
#SEMINAR ON THE PROTECTION
#BIOLOGICAL IMPLICATIONS OF THE NUCLEAR
FEASIBILITY EVALUATIONS OF PLOWSHARE EVENTS. PLOWSHARE #
#DETERMINATION OF BODY WATER IN HUMANS WITH THE
#THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST
#RECOMMENDATIONS ON MAXIMUM PERMISSIBLE CONCENTRATION IN
MAXIMUM PERMISSIBLE CONCENTRATION OF GASEOUS TRITIUM IN THE
#MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN
PERMISSIBLE CONCENTRATIONS OF RADIOACTIVE NUCLIDES IN
#LOS
#RECOMMENDED DIETARY
NUCLEOSIDES OTHER THAN THYMIDINE AND CF TRITIUM-LABELED
* #
#
#
CONCENTRATION OF TRITIUM* #CRITICAL
#
#STUDY IV-313, HAZARDS
T7609)* #REVIEW OF LABORATORY
AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND
#METHODS OF ESTIMATING POPULATION EXPOSURES FRCM PLOWSHARE
#SYMPOSIUM OF RADIOECOLOGY
#CONTROLLING TRITIUM HAZARDS
#HEALTH PHYSICS PROBLEMS DUE TO TRITIUM
#HAZARC OF TRITIUM
MEASUREMENT OF TRITIUM CONCENTRATICN IN EXHALED WATER VAPOR
#MEASUREMENT CF TRITIUM CONCN IN EXHALED WATFR VAPOUR
BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA)
DEUTERIUM.* #STUDIES OF METABOLIC TURNOVER WITH TRITIUM
#HEALTH PHYSICS
LABORATORY, LIVERMORE* #HEALTH PHYSICS
#HEALTH PHYSICS
#HEALTH PHYSICS
#HEALTH PHYSICS
- DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION
#INTERPRETATION OF BIO-
#
RECURRENT OR PROLONGED UPTAKES (T1000)* #

ABERATIONS RESULTING FROM 3H-THYMIDINE INCORPORATION INTO 041900 P 17
ABERRATIONS (T7605)* OF TRITIATED THYMIDINE, TRITIATED 064772 P 42
ABERRATIONS.*COMPARISONS OF TRITIATED THYMIDINE, TRITIATED 054639 P 30
ABSORBED DOSES FROM H-3, KR-85 AND XE-133* DOSE IN 049585 P 24
ABSORBED ON TITANIUM.* 052303 P 29
ABSORBED ON TITANIUM* 007399 P 3
ABSORPTION OF INGESTED TRITIUM WATER AND THE WATER 051405 P 28
ABSORPTION OF LIQUID HTO AND HTO VAPOR THROUGH THE SKIN OF 051406 P 28
ABSORPTION OF TRITIATEC WATER VAPOUR BY PEOPLE* 056159 P 31
ABSORPTION OF TRITIUM OXIDE.* 051628 P 29
ACCIDENT* 043213 P 19
ACCIDENTAL EXPOSURE IN STABLE OR REGENERATED ATMOSPHERES (028579 P 14
ACCURACY OF METHODS AND INTERPRETATION OF RESULTS OF H-3 029220 P 14
ACID AND TRITIATED WATER IN THE RAT* #RADIATION 062623 P 34
ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED 064769 P 42
ACIDS (T2297)* #INCORPORATION OF TRITIUM 064766 P 41
ACIDS* #TOXICITY OF TRITIUM-LABELED NUCLEOSIDES 040785 P 17
ACROSS GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS* 043246 P 19
ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF TRITIUM IN THE 011635 P 7
ACTION ON THE FETUS* #EXPTL STUDY OF 049527 P 24
ACTIVE GASES)* DE GAZ INACTIFS DU ACTIFS (CONTRIBUTION 011635 P 7
ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR 008708 P 6
ACTIVITY IN THE ATMOSPHERIC ENVIRONMENT.* #THEORETICAL 051408 P 29
ACTIVITY IN URINE FROM LUMINOUS DIAL WRIST WATCHES* 071195 P 51
ACTIVITY OF TRITIUM IN THE ORGANIC COMPONENTS OF THE SKIN 051407 P 28
ACUTE EXPOSURE OF MAN TO HTO OR T*2*O ACTIVITY IN THE 051408 P 28
ACUTE EXPOSURE TO HIGH CONCENTRATIONS OF TRITIUM GAS.* 051403 P 28
ACUTE INTAKE OF TRITIUM BY MAN* 071505 P 52
ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)* 064769 P 42
ADMINISTRATION (T2243)* 064748 P 39
ADMINISTRATION OF TRITIATED FOLIC ACID AND TRITIATED WATER 062623 P 34
ADMINISTRATION OF TRITIUM OXIDE TO RABBITS* 067165 P 49
ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* 064734 P 37
ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* 064733 P 37
AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT 038641 P 16
AEC SEEKS TO GET RECORD STRAIGHT ON TRITIUM* 039699 P 16
AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 33
AFTER ORAL ADMINISTRATION (T2243)* 064748 P 39
AFTER TRITIUM OXIDE IGENSTION* 049684 P 26
AGAINST THE DANGERS OF TRITIUM* 013458 P 7
AGE* 044674 P 21
AGE-DEPENDENT MODELS FOR ESTIMATING INTERNAL DOSE IN 027868 P 13
AID OF TRITIUM* 043197 P 19
AIR FROM A NUCLEAR PLANT. II* 008708 P 6
AIR OF INDUSTRIAL PREMISES FOR TRITIUM OXIDE* 062587 P 34
AIR OF INDUSTRIAL PREMISES* #THE 043100 P 18
AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (T1643)* 064776 P 43
AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS* #MAXIMUM 007226 P 2
ALAMOS HANDBOOK OF RADIATION MONITORING, 1970* 066510 P 49
ALLOWANCES (T2562T2297A)* 064742 P 39
AMINO ACIDS* #TOXICITY OF TRITIUM-LABELED 040785 P 17
ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM 064785 P 46
ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1965* 011919 P 7
ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1966* 017335 P 10
ANALYSIS OF ICRP DERIVATION OF MAXIMUM PERMISSIBLE 049711 P 27
ANALYSIS OF RADIATION EXPOSURES IN 1967* 027560 P 13
ANALYSIS, RADIOLOGICAL HAZARDS* 004672 P 1
ANDREW HULL ON KRYPTON, TRITIUM* 045018 P 22
ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF TRITIUM (064777 P 44
ANIMALS (T2297)* TOXICITY AND USE IN STUDY OF GROWTH RATES 064759 P 40
APPLICATIONS* 041584 P 17
APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT* 075576 P 53
AROUND HEAVY WATER MODERATED REACTORS* 027977 P 13
AROUND HEAVY-WATER REACTORS* 043122 P 18
AS A DNA LABEL IN MAN (T1858)* 064740 P 38
AS A MEANS OF ESTIMATING BODY BURDEN* # 036557 P 16
AS A MEANS OF ESTIMATING BODY BURDENS* 064782 P 45
AS A TEST SYSTEM.* BIOLOGICAL EFFECTIVENESS OF TRITIUM 051314 P 28
AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND 051582 P 29
ASPECTS OF LRL TRITIUM RELEASE* 067941 P 50
ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION 082793 P 56
ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING* 064780 P 45
ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING* 049197 P 23
ASPECTS OF TRITUIM* 065253 P 47
ASPECTS* #INTRANUCLEAR H-3 THYMIDINE 049714 P 27
ASSAY DATA* 008806 P 6
ASSESSING AND CONTROLLING THE HAZARD FROM TRITIATED WATER* 075523 P 52
ASSESSMENT OF INTERNAL CONTAMINATION RESULTING FROM 064775 P 43

RULISON* # ASSESSMENT OF POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT 002551 P 1
ASSESSMENT OF RADIOACTIVITY IN MAN. VOLUME II.* 007411 P 3
RADIOACTIVE INERT GASES, WITH EXAMPLES OF ABSORBED DOSES # ASSESSMENT OF TISSUF RADIATION DOSE IN CLINICAL USE OF 049585 P 24
ASSESSMENT OF TRITIUM IN MAN* 049550 P 24
ASSESSMENT OF TRITIUM IN MAN* 031065 P 15
ASSESSMENT OF TRITIUM IN PRODUCTION WORKERS* 049702 P 26
#THEORETICAL RADIATION DOSE TO THE HUMAN SYSTEM FROM ASSIMILATED TRITIUM* 077833 P 55
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR* 003269 P 1
TRITIUM GAS.* #A THEORETICAL CONSIDERATION OF THE HAZARDS ASSOCIATED WITH ACUTE EXPOSURE TO HIGH CONCENTRATIONS OF 051403 P 28
OF RADIOACTIVE MATERIALS. FOURTH ANNUAL MEETING OF THE ASSOCIATION OF SPECIALISTS FOR RADIATION PROTECTION, 048419 P 23
ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTERCCEANIC CANAL WITH NUCLEAR 016916 P 9
TO MAN FROM DISPOSAL OF TRITITIATED WATER VAPCR TO THE ATMOSPHERE* #RADIATION EXPOSURE 057580 P 32
TIME LIMITS OF ACCIDENTAL EXPOSURF IN STABLE OR REGENERATED ATMOSPHERES (IN FRENCH)* #TRITIUM AND TRITATED WATER- 028579 P 14
#HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE CF TRITIATED WATER* 061721 P 33
OF ACUTE EXPOSURE OF MAN TO HTO OR T*2*O ACTIVITY IN THE ATMOSPHERIC ENVIRONMENT.* #THEORETICAL CONSIDERATIONS 051408 P 29
#THE DOSE TO MAN FROM ATMOSPHERIC KR-85* 077309 P 54
RADIOPHOTOLUMINESCENT, DOSIMETERS* #EFFECT OF ATMOSPHERIC TRITIUM ON PHOTOGRAPHIC, THERMOLUMINESCENT AND 031061 P 15
#A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF 007852 P 5
LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, # ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR 066272 P 48
OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES IN URINE* 007852 P 5
#SURVEY OF AVAILABLE DATA ON TRITIUM (T0915)* 064732 P 37
#SURVEY OF AVAILABLE DATA ON TRITIUM (T0915)* 064731 P 36

#CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 21
BASIS HEALTH PHYSICS* 024425 P 12
EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTFM.* BIOLOGICAL 051314 P 28
EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY FDWARD P. RADFORD* #ENVIRONMENTAL 043979 P 20
EFFECTS OF ELECTRIC GENERATING PLANTS - TESTIMONY BEFORE JCAE BY VICTOR P. BOND* #ENVIRONMENTAL 044015 P 21
OF THE ASSOCIATION OF SPECIALISTS FOR RADIATION PROTECTION, BERLIN, 28-30 MAY 1969* MATERIALS. FOURTH ANNUAL MEETING 048419 P 23
MICE.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN 054897 P 30
#THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS* 049712 P 27
#THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS* 025635 P 12
TEST #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A 051314 P 28
COMPOUND WITH THAT OF TRITIATED WATER IN RATS #COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS 047898 P 22
WATER* #COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY 071194 P 51
WATER* #COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY 070544 P 51
#HEALTH PHYSICS BIBLIOGRAPHY ON TRITIUM* 004650 P 1
AND ITS 3-CYCLOPENTYL ETHER IN PATIENTS WITH BILE FISTULAS* OF INGESTED RADIOLABELED ETHYNYLESTRADIOL 049517 P 23
#INTERPRETATION OF BIO-ASSAY DATA* 008806 P 6
OF RADIONUCLIDE TRANSFER THROUGH THE PLACENTA AND THEIR BIOL ACTION ON THE FETUS* #EXPTL STUDY 049527 P 24
SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING 054897 P 30
THE BROAD BEAN ROOT (VICIA FABA) AS A TEST #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH 051314 P 28
UPTAKE IN RATS.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON 054914 P 30
TRITIUM GAS.* # BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF 051402 P 28
#DISTRIBUTION AND BIOLOGICAL EFFECTS OF RADIOACTIVE ISOTOPES* 043091 P 18
#CHEMICAL AND BIOLOGICAL EFFECTS OF TRITIUM* 077199 P 54
#OBSERVATIONS OF BIOLOGICAL HALF LIFE OF TRITIUM* 043273 P 19
THAT OF TRITIATED WATER IN RATS AND #COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFF OF A TRITIATED LUMINOUS COMPOUND WITH 047898 P 22
#OBSERVATION OF BIOLOGICAL HALF-LIFE OF TRITIUM (T3681)* 064767 P 41
BIOLOGICAL HALF-LIFE OF TRITIUM (T7377)* 062563 P 33
#LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM* 064779 P 44
#FURTHER STUDIES ON THE LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM* 076703 P 53
#LONG-TERM EVALUATION OF TGE BIOLOGICAL HALF-LIFE OF TRITIUM* 065162 P 46
#OBSERVATION OF BIOLOGICAL HALF-LIFE OF TRITIUM* 007677 P 5
#ASSESSMENT OF POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT RULISON* 002551 P 1
BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE* 044674 P 21
#USE OF RADIOACTIVE LUMINOUS COMPOUND AND NEED FOR BIOLOGICAL MONITORING OF WORKERS* 064784 P 45
THE USAGE OF RADIOACTIVE LUMINOUS COMPOUNC AND THE NEED FOR BIOLOGICAL MONITORING OR WORKERS* # 020666 P 10
#TRITIUM EXCHANGE IN BIOLOGICAL SYSTEMS* 043103 P 18
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 33
#HUMAN BIOLOGY AND BIOMEDICAL RESEARCH* 026493 P 12
ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 066272 P 48
#HUMAN BIOLOGY AND BIOMEDICAL RESEARCH* 026493 P 12
#DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL* 083078 P 57
#TRITIUM BODY BURDEN OF CHILDREN, 1967-1968* 045384 P 22
#INDIRECT METHODS OF ESTIMATING RADIONUCLIDE BODY BURDEN OR EXPOSURE* 007790 P 5
IN EXHALED WATER VAPOR AS A MEANS OF ESTIMATING BODY BURDEN* #MEASUREMENT OF TRITIUM CONCENTRATION 036557 P 16
CONCN IN EXHALED WATER VAPOUR AS A MEANS OF ESTIMATING BODY BURDENS* #MEASUREMENT OF TRITIUM 064782 P 45
EXPOSURE TO TRITIUM OXIDE* #EFFECT OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF 064778 P 44
OF MAN FOLLOWING EIGHT MONTHS# CHRONIC EXPOSURE TO HTO IN BODY FLUIDS.*IN THE ORGANIC COMPONENTS OF THE SKIN AND FAT 051407 P 28
#REPORT OF COMM 4 ON EVAL CF RADIATION DOSES TO BODY TISSUES FROM INTERNAL CONTAMINATION DUE TO 064774 P 43
#DETERMINATION OF BODY WATER IN HUMANS WITH THE AID OF TRITIUM* 043197 P 19
#DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE* 056179 P 31
BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER* #COMPARISON 071194 P 51
BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER* #COMPARISON 070544 P 51
GENERATING PLANTS - TESTIMONY BEFORF JCAE BY VICTOR P. BOND* #ENVIRONMENTAL EFFECTS OF ELECTRIC 044015 P 21
#DETERMINATION OF K-42, NA-24, BR-82 AND TRITIATED WATER CONCENTRATION IN MAN.* 051998 P 20
#CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (T1510)* 064743 P 39
#SKIN CONTACT TRANSFER OF TRITIUM FROM BRASS* 008999 P 6
#SKIN CONTACT TRANSFER OF TRITIUM FROM BRASS* 006241 P 1
SORBED ON METAL SURFACES PART I THE SORPTION OF TRITIUM ON BRASS* #THE R'DIOLOGICAL HAZARD FROM TRITIUM 028491 P 14
BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.* RELATIVE 051314 P 28
#TRITIUM BODY BURDEN OF CHILDREN, 1967-1968* 045384 P 22
#INDIRECT METHCDS OF ESTIMATING RADIONUCLIDE BODY BURDEN OR EXPOSURE* 007790 P 5
IN EXHALED WATER VAPOR AS A MEANS OF ESTIMATING BODY BURDEN* #MEASUREMENT OF TRITIUM CONCENTRATION 036557 P 16

CONCN IN EXHALED WATER VAPOUR AS A MEANS OF ESTIMATING BODY BURDENS* #MEASUREMENT OF TRITIUM 064782 P 45
ACROSS GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS* #TRANSFER OF WATER AND ELECTROLYTES 043246 P 19

#SPEECH BY PAUL C. TOMPLINS, EX. DIR., FRC* 065296 P 47
#DOSIMETRY OF H-3 AND C-14 COMPOUNDS (T1797)* 067136 P 49
#RADIOTOXICOLOGY OF TRITIUM AND C-14 COMPOUNDS* 049586 P 25
#RAPID MONITORING OF TRITIUM AND C-14 IN URINE* 029671 P 14
#RADIATION DOSE CALCULATION IN CELLS CONTAINING INTRANUCLEAR TRITIUM.* 052315 P 29
#DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL* 083078 P 57
#AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* 038641 P 16
CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 21
AND HEALTH PHYSICS DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY 066272 P 48
PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I* STUDIES RELATED TO 016916 P 9
#TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4- 049600 P 25
#INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* 064766 P 41
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 064785 P 46
LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS* BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED 047898 P 22
#THE NITROUS OXIDE DOSIMETER--INFLUENCE OF CELL DIAMETER ON THE NITROGEN YIELD* 007390 P 2
#DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)* 064753 P 60
#RADIATION DOSE CALCULATION IN CELLS CONTAINING INTRANUCLEAR TRITIUM.* 052315 P 29
#RADIATION PROTECTION AT THE NATIONAL NUCLEAR RESEARCH CENTER, PELINDABA* 040379 P 17
VAPOR* #DOSE TO MAN VIA FOOD- CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER 070396 P 50
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 35
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER* 021995 P 11
LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER NUCLEAR LABORATORIES* #THE MEASUREMENT OF HIGH 006997 P 2
PHYSICS DIVISION, #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH 066272 P 48
CHEMICAL AND BIOLOGICAL EFFECTS OF TRITIUM* 077199 P 54
CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (T1510)* 064743 P 39
#INTERNAL EXPOSURE OF CHEMIST TO TRITIUM* 026087 P 12
#TRITIUM BODY BURDEN OF CHILDREN, 1967-1968* 045384 P 22
INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN # CHROMATID ABERATIONS RESULTING FROM 3H-THYMIDINE 041900 P 17
TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (T7605)* OF TRITIATED THYMIDINE, 064772 P 42
TRITIATED WATER, AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS.* OF TRITIATED THYMIDINE, 054639 P 30
#TISSUE DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE TO RABBITS* 067165 P 49
OF THE SKIN AND FAT OF MAN FOLLOWING EIGHT MONTHS# CHRONIC EXPOSURE TO HTO IN BODY FLUIDS.*ORGANIC COMPONENTS 051407 P 28
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 049713 P 27
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 031417 P 16
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 023261 P 11
#JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 9
#IMPORTANCE OF TRITIUM IN THE CIVIL DEFENSE CONTEXT* 067964 P 50
#SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC* 065420 P 47
#AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* 038641 P 16
#CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 21
ABSORBED DOSES FROM #ASSESSMENT OF TISSUE RADIATION DOSE IN CLINICAL USE OF RADIOACTIVE INERT GASES, WITH EXAMPLES OF 049585 P 24
#CALVERT CLIFFS, BALTIMORE GAS AND ELECTRIC CO.* 044109 P 21
#COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (064772 P 42
#COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER, AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS.* 054639 P 30
INTERNAL CONTAMINATION DUE TO OCCUPATIONAL #REPORT OF COMM 4 ON EVAL OF RADIATION DOSES TO BODY TISSUES FROM 064774 P 43
CLIFFS NUCLEAR POWER PLANTS* #AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT 038641 P 16
#SPEECH BY CLARENCE F. LARSON, COMMISSIONER, USAEC* 065420 P 47
COMPARATIVE METABOLISM OF TRITIATED WATER BY MAMMALS* 043593 P 20
OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.* #STUDIES 051582 P 29
LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND # COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED 047898 P 22
AND BODY WATER* # COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER 071194 P 51
AND BODY WATER* # COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER 070544 P 51
IN WATER (MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND 064773 P 42
IN WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 051573 P 29
COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (# COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND 064772 P 42
COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS.* # COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER, AND 054639 P 30
#JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 9
MONTHS# #THE SPECIFIC ACTIVITY OF TRITIUM IN THE ORGANIC COMPONENTS OF THE SKIN AND FAT OF MAN FOLLOWING EIGHT 051407 P 28
CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* # 064733 P 37
CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* # 064734 P 37
#CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (T1510)* 064743 P 39
#USE OF RADIOACTIVE LUMINOUS COMPOUND AND NEED FOR BIOLOGICAL MONITORING OF WORKERS* 064784 P 45
#THE USAGE OF RADIOACTIVE LUMINOUS COMPOUND AND THE NEED FOR BIOLOGICAL MONITORING OR WORKERS* 020666 P 10
BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS* 047898 P 22
#RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS (T0257)* 064730 P 36
#DOSIMETRY OF H-3 AND C-14 COMPOUNDS (T1797)* 067136 P 49
#INVESTIGATION OF TRITIATED LUMINOUS COMPOUNDS* 065935 P 48
#RADIOTOXICOLOGY OF TRITIUM AND C-14 COMPOUNDS* 049586 P 25
#THE RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS* 007461 P 4
FROM FIVE INDIVIDUALS WORKING WITH VARIOUS TRITIUM COMPOUNDS* #ESTIMATES OF DOSE EQUIVALENTS 082354 P 56
#RADIOTOXICOLOGY OF TRITIUM AND 14-C COMPOUNDS.* 054534 P 30
#HEALTH PHYSICS UTILIZATION OF AN IBM 1620 COMPUTER* 006867 P 2
#MAXIMUM PERMISSIBLE CONCENTRATION FOR TRITIATED WATER AND TRITIATED THYMIDINE* 061912 P 32
OXIDE* #RECOMMENDATIONS ON MAXIMUM PERMISSIBLE CONCENTRATION IN AIR OF INDUSTRIAL PREMISES FOR TRITIUM 062587 P 34
#COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER* 070544 P 51
#COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER* 071194 P 51
ESTIMATING BODY BURDEN* #MEASUREMENT OF TRITIUM CONCENTRATION IN EXHALED WATER VAPOR AS A MEANS OF 036557 P 16
#DETERMINATION OF K-42, NA-24, BR-82 AND TRITIATED WATER CONCENTRATION IN MAN.* 051998 P 29
PREMISES* #THE MAXIMUM PERMISSIBLE CONCENTRATION OF GASEOUS TRITIUM IN THE AIR OF INDUSTRIAL 043100 P 18
CRITICAL ANALYSIS OF ICRP DERIVATION OF MAXIMUM PERMISSIBLE CONCENTRATION OF TRITIUM* # 049711 P 27
#TRITIUM CONCENTRATIONS IN FOOD, 1967-1968* 045385 P 22
SES COMPOSES* # CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET 064733 P 37

SES COMPOSES*	# CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET	064734 P 37
EFFLUENTS FROM NUCLEAR REACTORS* #MAXIMUM PERMISSIBLE	CONCENTRATIONS OF RADIOACTIVE NUCLIDES IN AIRBORNE	007226 P 2
INTERSPECIES #ESTIMATION OF MAXIMUM PERMISSIBLE	CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM	051573 P 29
#BIOLOGICAL EFFECTS OF INHALATION OF HIGH	CONCENTRATIONS OF TRITIUM GAS.*	051402 P 28
OF THE HAZARDS ASSOCIATED WITH ACUTE EXPOSURE TO HIGH	CONCENTRATIONS OF TRITIUM GAS.*A THEORETICAL CONSIDERATION	051403 P 28
BODY BURDENS* #MEASUREMENT OF TRITIUM	CONCN IN EXHALED WATER VAPOUR AS A MEANS OF ESTIMATING	064782 P 45
NUCLEAR REACTORS (T1643)* #MAXIMUM PERMISSIBLE	CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM	064776 P 43
CORRELATIONS. I. COMPARISON OF ESTD #EST OF MAX PERMISSIBLE	CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM INTERSPECIES	064773 P 42
EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E	CONGRESS OF THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL	044471 P 21
POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST	CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC	044471 P 21
#PROBLEMS OF RADIATION PROTECTION IN	CONNECTION WITH TRITIUM*	028925 P 14
#PROBLEMS OF RADIATION PROTECTION IN	CONNECTION WITH TRITIUM*	021754 P 11
EXPOSURE TO HIGH CONCENTRATIONS OF TRITIUM #A THEORETICAL	CONSIDERATION OF THE HAZARDS ASSOCIATED WITH ACUTE	051403 P 28
ACTIVITY IN THE ATMOSPHERIC ENVIRONMENT.* #THEORETICAL	CONSIDERATIONS OF ACUTE EXPOSURE OF MAN TO HTO OR T*2*O	051408 P 28
WITH NUCLEAR #DOSE-ESTIMATION STUDIES RELATED TO PROPOSED	CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL	016916 P 9
#SKIN	CONTACT TRANSFER OF TRITIUM FROM BRASS*	008999 P 6
#SKIN	CONTACT TRANSFER OF TRITIUM FROM BRASS*	006241 P 1
#THE MAXIMUM PERMISSIBLE ACTIVITY	CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. II*	008708 P 6
#RADIATION DOSE CALCULATION IN CELLS	CONTAINING INTRANUCLEAR TRITIUM.*	052315 P 29
#RADIOLOGICAL RISKS RELATIVE TO THE DISTRIBUTION OF	CONTAMINATED GAS*	075915 P 53
#TRITIUM	CONTAMINATION AT THEODORE R. SCHWALM, INC.*	010200 P 7
4 ON EVAL OF RADIATION DOSES TO BODY TISSUES FROM INTERNAL	CONTAMINATION DUE TO OCCUPATIONAL EXPOSURE (T1000)*OF COMM	064774 P 43
UPTAKES (T1000)* #ASSESSMENT OF INTERNAL	CONTAMINATION RESULTING FROM RECURRENT OR PROLONGED	064775 P 43
#INTERNAL	CONTAMINATION WITH TRITIUM*	060933 P 33
#THE HAZARD FROM TRITIUM	CONTAMINATION*	057579 P 32
#DNA AND RNA	CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)*	064737 P 38
#IMPORTANCE OF TRITIUM IN THE CIVIL DEFENSE	CONTEXT*	067964 P 50
#SOME EFFECTS ON MAMMALIAN DEVELOPMENT OF	CONTINUOUS IRRADIATION IN UTERO WITH TRITIATED WATER*	065122 P 46
STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE #	CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A	052834 P 29
INACTIFS OU ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF #	CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ	011635 P 7
DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU ACTIFS (	CONTRIBUTION TO THE DOSIMETRY OF TRITIUM IN THE PRESENCE	011635 P 7
#HEALTH PHYSICS ASPECTS OF TRITIUM	CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE*	082793 P 56
#QUESTION 15 - TRITIUM	CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.*	016512 P 9
PLANT* #	CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER	064768 P 41
#INDEX TO HAZARDS	CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 19*	007430 P 4
EXPERIENCE, AND PROBLEMS IN HEALTH PHYSICS TRITIUM	CONTROL* #REVIEW OF SANDIA SYMPOSIUM ON INSTRUMENTATION,	024143 P 12
#ASSESSING AND	CONTROLLING THE HAZARD FROM TRITIATED WATER*	075523 P 52
REACTORS* #	CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED	027977 P 13
#TRITIUM EXPOSURE AT U.S. RADIUM	CORP. JAN. 11, 1967*	015084 P 9
#TRITIUM EXPOSURE AT US RADIUM	CORP., DEC. 13, 1966*	015083 P 8
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR	CORPORATION*	014080 P 8
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR	CORPORATION, FEBRUARY 16, 1966*	009302 P 7
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR	CORPORATION, FEBRUARY 24, 1966*	009025 P 6
#TRITIUM EXPOSURE AT U. S. RADIUM	CORPORATION, JUNE 2, 1966*	010561 P 7
CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM INTERSPECIES	CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES	064773 P 42
OF RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES	CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED	051573 P 29
#ESTIMATION OF RADIATION PROTECTION GUIDES - INTERSPECIES	CORRELATIONS*	013758 P 8
#ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT OF	COUNCIL ON ENVIRONMENTAL QUALITY*	065195 P 46
PERMISSIBLE CONCENTRATION OF TRITIUM* #	CRITICAL ANALYSIS OF ICRP DERIVATION OF MAXIMUM	049711 P 27
#FATE OF INGESTED RADIOLABELED ETHYNYLESTRADIOL AND ITS 3-	CYCLOPENTYL ETHER IN PATIENTS WITH BILE FISTULAS*	049517 P 23

OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL	DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED	052834 P 29
#SEMINAR ON THE PROTECTION AGAINST THE	DANGERS OF TRITIUM*	013458 P 7
RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION	DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES* OF INTERNAL	049700 P 26
RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION	DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES* OF INTERNAL	007420 P 3
#SURVEY OF AVAILABLE	DATA ON TRITIUM (T0915)*	064731 P 36
#SURVEY OF AVAILABLE	DATA ON TRITIUM (T0915)*	064732 P 37
#INTERPRETATION OF BIO-ASSAY	DATA*	008806 P 6
#ELK RIVER REACTOR SYSTEM MONITORING	DATA*	043571 P 20
OF #CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN PRESENCE	DE GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE DOSIMETRY	011635 P 7
#HEALTH PHYSICS AND MEDICAL DIVISION PROGRESS REPORT, JAN -	DEC 1968*	045597 P 22
#TRITIUM EXPOSURE AT US RADIUM CORP.,	DEC. 13, 1966*	015083 P 9
31, 1966.* #THE EFFECTS OF TRITIUM	DECAY ON DNA. PROGRESS REPORT, JUNE 1, 1966 TO DECEMBER	053555 P 30
#EFFECTS OF TRITIUM	DECAY ON DNA*	065659 P 48
#IMPORTANCE OF TRITIUM IN THE CIVIL	DEFENSE CONTEXT*	067964 P 50
FEASIBILITY EVALUATIONS OF PLOWSHARE EVENTS. PLOWSHARE #AGE-	DEPENDENT MODELS FOR ESTIMATING INTERNAL DOSE IN	027868 P 13
#EVALUATION OF LONG TERM EFFECTS OF EXPOSURE TO INTERNALLY	DEPOSITED RADIONUCLIDES*	066331 P 48
#THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN	DEPRESSING IRON UPTAKE IN RATS.*	054914 P 30
#CRITICAL ANALYSIS OF ICRP	DERIVATION OF MAXIMUM PERMISSIBLE CONCENTRATION OF TRITIUM*	049711 P 27
TRITIUM* #	DETERMINATION OF BODY WATER IN HUMANS WITH THE AID OF	043197 P 19
INTAKE (T5547)* #	DETERMINATION OF INTERNAL RADIATION DOSES FOR TRITIUM	064729 P 36
CONCENTRATION IN MAN.* #	DETERMINATION OF K-42, NA-24, BR-82 AND TRITIATED WATER	051998 P 29
USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE	DETERMINATION OF RADIONUCLIDES IN URINE* OF THE METHODS	007852 P 5
#	DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE*	056179 P 31
AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND	DEUTERIUM.* #STUDIES OF METABOLIC TURNOVER WITH TRITIUM	051582 P 29
#HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS	DIAL PAINTING*	064780 P 45
#HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS	DIAL PAINTING*	049197 P 23
#TRITIUM ACTIVITY IN URINE FROM LUMINOUS	DIAL WRIST WATCHES*	071195 P 51
#THE NITROUS OXIDE DOSIMETER--INFLUENCE OF CELL	DIAMETER ON THE NITROGEN YIELD*	007390 P 2
#RECOMMENDED	DIETARY ALLOWANCES (T2562T2297A)*	064742 P 39
AND WAGON WHEEL* #	DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO	083078 P 57
#THE ABSORPTION OF INGESTED TRITIUM WATER AND THE WATER	DILUTION VOLUME OF MAN.*	051405 P 28
PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL	DIPHOSPHATE* HALF-LIVES AND RADIATION DOSES OF CANCER	049600 P 25
#SPEECH BY PAUL C. TOMPLINS, EX.	DIR., FRC*	065296 P 47
#HEALTH IMPLICATIONS OF ATMOSPHERIC	DISCHARGE OF TRITIATED WATER*	061721 P 33

#RADIATION EXPOSURE TO MAN FROM	OISPOSAL OF TRITITIATED WATER VAPOR TO THE ATMOSPHERE*	057580 P 32
FOR PERIOD ENDING JULY 31, 1967. PART I. RADIOACTIVF WASTE	DISPOSAL* #HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT	021935 P 11
TRITIUM OXIDE* #EFFECT OF BODY	DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO	064778 P 44
* #	DISTRIBUTION AND BIOLOGICAL EFFECTS OF RADIOACTIVE ISOTOPES	043091 P 18
#RADIOLOGICAL RISKS RELATIVE TO THE	DISTRIBUTION OF CONTAMINATED GAS*	075915 P 53
1968* #HEALTH PHYSICS	DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31,	030135 P 15
1967. PART I. RADIOACTIVE WASTE DISPOSAL* #HEALTH PHYSICS	DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31,	021935 P 11
1965* #HEALTH PHYSICS	DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31,	013658 P 8
#HEALTH AND SAFETY	DIVISION ANNUAL PROGRESS REPORT, 1963*	007507 P 4
#HEALTH PHYSICS AND MEDICAL	DIVISION PROGRESS REPORT. JANUARY - DECEMBER 1964*	007422 P 3
#HEALTH PHYSICS AND MEDICAL	DIVISION PROGRESS REPORT, JAN - DEC 1968*	045597 P 22
#HEALTH PHYSICS AND MEDICAL	DIVISION RESEARCH PROGRESS REPORT, JANUARY - DECEMBER 1966*	019436 P 10
RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS	DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*LIMITED, CHALK	066272 P 48
#INCORPORATION OF TRITIATED THYMIDINE INTO	DNA AFTER ORAL ADMINISTRATION (T22431*	064748 P 39
T18581* #	DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (	064737 P 38
#HAZARD OF TRITIUM AS A	DNA LABEL IN MAN (T18581*	064740 P 38
#EFFECTS OF TRITIUM DECAY ON	DNA*	065659 P 48
#THE EFFECTS OF TRITIUM DECAY ON	DNA. PROGRESS REPORT, JUNE 1, 1966 TO DECEMBER 31, 1966.*	053555 P 30
#RADIATION	DOSE CALCULATION IN CELLS CONTAINING INTRANUCLEAR TRITIUM.*	052315 P 29
#DIFFUSION AND	DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL*	083078 P 57
#RADIATION	DOSE DUE TO ACUTE INTAKE OF TRITIUM BY MAN*	071505 P 52
VARIOUS TRITIUM COMPOUNDS* #ESTIMATES OF	DOSE EQUIVALENTS FROM FIVE INDIVIDUALS WORKING WITH	082354 P 56
#NEW	DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES*	049713 P 27
#NEW	DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES*	031417 P 16
#NEW	DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES*	023261 P 11
#INTERNAL	DOSE ESTIMATION*	043153 P 19
NUMBER OF IMPORTANT #ESTIMATION OF INTERNAL RADIATION	DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A	049700 P 26
NUMBER OF IMPORTANT #THE ESTIMATION OF INTERNAL RADIATION	DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A	007420 P 3
OXIDE (GENSTION* #RADIATION	DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM	049684 P 26
EXAMPLES OF ABSORBED DOSES #ASSESSMENT OF TISSUE RADIATION	DOSE IN CLINICAL USE OF RADIOACTIVE INERT GASES, WITH	049585 P 24
PLOWSHARE #AGE-DEPENDENT MODELS FOR ESTIMATING INTERNAL	DOSE IN FEASIBILITY EVALUATIONS OF PLOWSHARE EVENTS.	027868 P 13
RADIORESISTANCE #CONTINUOUS IRRADIATION OF THE RAT AT HIGH	DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND	052834 P 29
#THE	DOSE TO MAN FROM ATMOSPHERIC KR-85*	077309 P 54
EXPOSURE TO TRITIATED WATER VAPOR* #	DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM	070396 P 50
#	DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)*	064753 P 40
#THEORETICAL RADIATION	DOSE TO THE HUMAN SYSTEM FROM ASSIMILATED TRITIUM*	077833 P 55
OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR #	DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION	016916 P 9
#DETERMINATION OF INTERNAL RADIATION	DOSES FOR TRITIUM INTAKE (T5547)*	064729 P 36
RABBITS* #TISSUE	DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE TO	067165 P 49
USE OF RADIOACTIVE INERT GASES, WITH EXAMPLES OF ABSORBED	DOSES FROM H-3, KR-85 AND XE-133* DOSE IN CLINICAL	049585 P 24
1,4-NAPHTHAQUINOL #TRITIUM UPTAKE HALF-LIVES AND RADIATION	DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-	049600 P 25
#RADIATION	DOSES RECEIVED BY WORKERS USING TRITIUM IN INDUSTRY*	048519 P 23
ACID AND TRITIATED WATER IN THE RAT* #RADIATION	DOSES RESULTING FROM ADMINISTRATION OF TRITIATED FOLIC	062623 P 34
OCCUPATIONAL #REPORT OF COMM 4 ON EVAL OF RADIATION	DOSES TO BODY TISSUES FROM INTERNAL CONTAMINATION DUE TO	064774 P 43
#THE NITROUS OXIDE	DOSIMETER--INFLUENCE OF CELL DIAMETER ON THE NITROGEN YIELD	007390 P 2
*	DOSIMETERS* #EFFECT OF ATMOSPHERIC TRITIUM ON	031061 P 15
PHOTOGRAPHIC, THERMOLUMINESCENT AND RADIOPHOTOLUMINESCENT,	DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION	049714 P 27
ASPECTS* #INTRANUCLEAR H-3 THYMIDINE -	DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU	011635 P 7
ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF #CONTRIBUTION A LA	DOSIMETRY OF H-3 AND C-14 COMPOUNDS (T1797)*	067136 P 49
#	DOSIMETRY OF TRITIUM IN THE PRESENCE OF INACTIVE OR ACTIVE	011635 P 7
EN PRESENCE DE GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE	DRINKING WATER AND BODY WATER*	071194 P 51
#COMPARISON BETWEEN TRITIUM CONCENTRATION IN	DRINKING WATER AND BODY WATER*	070544 P 51
#COMPARISON BETWEEN TRITIUM CONCENTRATION IN	DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU ACTIFS (	011635 P 7
CONTRIBUTION TO THE DOSIMETRY #CONTRIBUTION A LA DOSIMETRIE	DUE TO ACUTE INTAKE OF TRITIUM BY MAN*	071505 P 52
#RADIATION DOSE	DUE TO OCCUPATIONAL EXPOSURE (T1000)* OF COMM 4 ON EVAL OF	064774 P 43
RADIATION DOSES TO BODY TISSUES FROM INTERNAL CONTAMINATION	DUE TO TRITIUM AROUND HEAVY-WATER REACTORS*	043122 P 18
#HEALTH PHYSICS PROBLEMS		

#SPEECH BY CLARENCE	E. LARSON, COMMISSIONER, USAEC*	065420 P 47
ABERATIONS RESULTING FROM 3H-THYMIDINE INCORPORATION INTO	EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS* #CHROMATID	041900 P 17
OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY	EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS	043979 P 20
THERMOLUMINESCENT AND RADIOPHOTOLUMINESCENT, DOSIMETERS* #	EFFECT OF ATMOSPHERIC TRITIUM ON PHOTOGRAPHIC,	031061 P 15
OF EXPOSURE TO TRITIUM OXIDE* #	EFFECT OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD	064778 P 44
T2297)* #	EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (	064741 P 38
#TRANSMUTATION	EFFECT*	040787 P 17
#OBSERVED	EFFECTIVE HALF-LIFE OF TRITIUM AT THE SAVANNAH RIVER PLANT*	056158 P 30
AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE BIOLOGICAL	EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC	054897 P 30
BEAN ROOT (VICIA FABA) AS A TEST #THE RELATIVE BIOLOGICAL	EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD	051314 P 28
* #THE RELATIVE BIOLOGICAL	EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN RATS.	054914 P 30
JCAE BY VICTOR P. BOND* #ENVIRONMENTAL	EFFECTS OF ELECTRIC GENERATING PLANTS - TESTIMONY BEFORE	044015 P 21
JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL	EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE	043979 P 20
#EVALUATION OF LONG TERM	EFFECTS OF EXPOSURE TO INTERNALLY DEPOSITED RADIONUCLIDES*	066331 P 48
GAS.* #BIOLOGICAL	EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF TRITIUM	051402 P 28
#	EFFECTS OF INTRACELLULAR IRRADIATION WITH TRITIUM.*	053130 P 30
CONGRESS OF THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL	EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E	044471 P 21
#DISTRIBUTION AND BIOLOGICAL	EFFECTS OF RADIOACTIVE ISOTOPES*	043091 P 18
#SOME	EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL DEVELOPMENT*	049533 P 24
1966 TO DECEMBER 31, 1966.* #THE	EFFECTS OF TRITIUM DECAY ON DNA. PROGRESS REPORT, JUNE 1,	053555 P 30
#	EFFECTS OF TRITIUM DECAY ON DNA*	065659 P 48
#CHEMICAL AND BIOLOGICAL	EFFECTS OF TRITIUM*	077199 P 54
IN UTERO WITH TRITIATED WATER* #SOME	EFFECTS ON MAMMALIAN DEVELOPMENT OF CONTINUOUS IRRADIATION	065122 P 46
#FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM	EFFECTS*	082319 P 55
PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE	EFFLUENTS FROM NUCLEAR REACTORS (T1643)* #MAXIMUM	064776 P 43
CONCENTRATIONS OF RADIOACTIVE NUCLIDES IN AIRBORNE	EFFLUENTS FROM NUCLEAR REACTORS* #MAXIMUM PERMISSIBLE	007226 P 2
THE ORGANIC COMPONENTS OF THE SKIN AND FAT OF MAN FOLLOWING	EIGHT MONTHS@ CHRONIC EXPOSURE TO HTO IN BODY FLUIDS.* IN	051407 P 28
#CALVERT CLIFFS, BALTIMORE GAS AND	ELECTRIC CO.*	044109 P 21

VICTOR P. BOND* #ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS - TESTIMONY BEFORE JCAE BY 044015 P 21
EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY 043979 P 20
91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 044471 P 21
FOLLOWING BURNS* #TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN PATIENTS 043246 P 19
ELK RIVER REACTOR SYSTEM MONITORING DATA* 043571 P 20
#HEALTH HAZARDS FROM RADIOACTIVE EMISSIONS* 080838 P 55
#THE QUALITY FACTOR FOR LOW-ENERGY BETA- EMITTERS* 049712 P 27
#THE QUALITY FACTOR FOR LOW-ENERGY BETA- EMITTERS* 025635 P 12
DOSIMETRY OF #CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE 011635 P 7
#HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1965* 013658 P 8
#HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1967. PART I. RADIOACTIVE WASTE DISPOSAL* 021935 P 11
#HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1968* 030135 P 15
#A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES IN 007852 P 5
#THE QUALITY FACTOR FOR LOW- ENERGY BETA-EMITTERS* 025635 P 12
#THE QUALITY FACTOR FOR LOW- ENERGY BETA-EMITTERS* 049712 P 27
LABORATORIES. BIOLOGY AND HEALTH PHYSICS DIVISION. #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR 066272 P 48
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION* 014080 P 8
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966* 009302 P 7
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966* 009025 P 6
#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 49
EXPOSURE OF MAN TO HTO OR T*2*O ACTIVITY IN THE ATMOSPHERIC ENVIRONMENT.* #THEORETICAL CONSIDERATIONS OF ACUTE 051408 P 28
#THE NATURAL RADIATION ENVIRONMENT* 062687 P 34
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 070395 P 50
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 072960 P 52
OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT* #SYMPOSIUM 075576 P 53
TESTIMONY BEFORE JCAE BY VICTOR P. BOND* # ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS - 044015 P 21
TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* # ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- 043979 P 20
HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS* # ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - 044471 P 21
#ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON ENVIRONMENTAL QUALITY* 065195 P 46
ENVIRONMENTAL QUALITY* # ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON 065195 P 46
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 064785 P 46
#RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON-85* 082780 P 56
TRITIUM COMPOUNDS* #ESTIMATES OF DOSE EQUIVALENTS FROM FIVE INDIVIDUALS WORKING WITH VARIOUS 082354 P 56
MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF # EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (064773 P 42
(MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND TRITIUM (T1643)* 064773 P 42
THYMIDINE* #PRELIMINARY ESTIMATE OF THE HAZARD FROM INGESTION OF TRITIATED 058835 P 32
(MPC)*W* FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND TRITIUM.* 051573 P 29
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 049713 P 27
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 031417 P 16
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 023261 P 11
WORKING WITH VARIOUS TRITIUM COMPOUNDS* # ESTIMATES OF DOSE EQUIVALENTS FROM FIVE INDIVIDUALS 082354 P 56
TRITIUM CONCENTRATION IN EXHALED WATER VAPOR AS A MEANS OF ESTIMATING BODY BURDEN* #MEASUREMENT OF 036557 P 16
OF TRITIUM CONCN IN EXHALED WATER VAPOUR AS A MEANS OF ESTIMATING BODY BURDENS* #MEASUREMENT 064782 P 45
PLOWSHARE EVENTS. PLOWSHARE #AGE-DEPENDENT MODELS FOR ESTIMATING INTERNAL DOSE IN FEASIBILITY EVALUATIONS OF 027868 P 13
* #METHODS OF ESTIMATING POPULATION EXPOSURES FROM PLOWSHARE APPLICATIONS 041584 P 17
#INDIRECT METHODS OF ESTIMATING RADIONUCLIDE BODY BURDEN OR EXPOSURE* 007790 P 5
URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT #THE ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND 007420 P 3
URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT # ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND 049700 P 26
RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES # ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF 051573 P 29
CORRELATIONS* # ESTIMATION OF RADIATION PROTECTION GUIDES - INTERSPECIES 013758 P 8
ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR #DOSE- ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN 016916 P 9
#INTERNAL DOSE ESTIMATION* 043153 P 19
#INCORPORATION HAZARDS AND THEIR ESTIMATION* 070413 P 51
#CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* 064733 P 37
#CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* 064734 P 37
RADIOLABELED ETHYNYLESTRADIOL AND ITS 3-CYCLOPENTYL ETHER IN PATIENTS WITH BILE FISTULAS* #FATE OF INGESTED 049517 P 23
WITH BILE FISTULAS* #FATE OF INGESTED RADIOLABELED ETHYNYLESTRADIOL AND ITS 3-CYCLOPENTYL ETHER IN PATIENTS 049517 P 23
CONTAMINATION DUE TO OCCUPATIONAL #REPORT OF COMM 4 ON EVAL OF RADIATION DOSES TO BODY TISSUES FROM INTERNAL 064774 P 43
DEPOSITED RADIONUCLIDES* # EVALUATION OF LONG TERM EFFECTS OF EXPOSURE TO INTERNALLY 066331 P 48
EVALUATION OF POTENTIAL HAZARDS FROM TRITIUM WATER* 017134 P 10
#LONG-TERM EVALUATION OF TGE BIOLOGICAL HALF-LIFE OF TRITIUM* 065162 P 46
#LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM* 064779 P 44
#FURTHER STUDIES ON THE LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM* 076703 P 53
MODELS FOR ESTIMATING INTERNAL DOSE IN FEASIBILITY EVALUATIONS OF PLOWSHARE EVENTS. PLOWSHARE RESEARCH AND 027868 P 13
INTERNAL DOSE IN FEASIBILITY EVALUATIONS OF PLOWSHARE EVENTS. PLOWSHARE RESEARCH AND DEVELOPMENT PROGRESS 027868 P 13
#SPEECH BY PAUL C. TOMPLINS, EX. DIR., FRC* 065296 P 47
DOSE IN CLINICAL USE OF RADIOACTIVE INERT GASES, WITH EXAMPLES OF ABSORBED DOSES FROM H-3, KR-85 AND XE-133* 049585 P 24
#TRITIUM EXCHANGE IN BIOLOGICAL SYSTEMS* 043103 P 18
#RADIATION DOSE FROM NON- EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE IGENSTION* 049684 P 26
OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES* 049700 P 26
OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES* 007420 P 3
TWO EXPONENTIAL MODEL* #URINARY EXCRETION OF TRITIUM FOLLOWING EXPOSURE OF MAN TO HTO - A 049605 P 25
#MEASUREMENT OF TRITIUM CONCENTRATION IN EXHALED WATER VAPOR AS A MEANS OF ESTIMATING BODY BURDEN* 036557 P 16
#MEASUREMENT OF TRITIUM CONCN IN EXHALED WATER VAPOUR AS A MEANS OF ESTIMATING BODY BURDENS* 064782 P 45
#THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. II* 008708 P 6
* # EXPERIENCE WITH THE USE OF RADIOACTIVE HYDROGEN IN INDUSTRY 043306 P 20
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 35
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER* 021995 P 11
#REVIEW OF SANDIA SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL* 024143 P 12
#REVIEW OF LABORATORY ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF TRITIUM (T7609)* 064777 P 44
#FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS* 082319 P 55
OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I* RELATED TO PROPOSED CONSTRUCTION 016916 P 9
OF TRITIUM FOLLOWING EXPOSURE OF MAN TO HTO - A TWO EXPONENTIAL MODEL* #URINARY EXCRETION 049605 P 25
TISSUES FROM INTERNAL CONTAMINATION DUE TO OCCUPATIONAL EXPOSURE (T1000)*COMM 4 ON EVAL OF RADIATION DOSES TO BODY 064774 P 43
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION* 014080 P 8
1966* #TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 009302 P 7
1966* #TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 009025 P 6
#TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966* 009022 P 6

#TRITIUM	EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966*	010561 P 7
#TRITIUM	EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967*	015084 P 9
#TRITIUM	EXPOSURE AT US RADIUM CORP., DEC. 13, 1966*	015083 P 8
@TRITIUM AND TRITATED WATER- TIME LIMITS OF ACCIDENTAL	EXPOSURE IN STABLE OR REGENERATED ATMOSPHERES (IN FRENCH)*	028579 P 14
#INTERNAL	EXPOSURE OF CHEMIST TO TRITIUM*	026087 P 12
#URINARY EXCRETION OF TRITIUM FOLLOWING	EXPOSURE OF MAN TO HTO - A TWO EXPONENTIAL MODEL*	049605 P 25
ATMOSPHERIC #THEORETICAL CONSIDERATIONS OF ACUTE	EXPOSURE OF MAN TO HTO OR T*2*O ACTIVITY IN THE	051408 P 28
CONSIDERATION OF THE HAZARDS ASSOCIATED WITH ACUTE	EXPOSURE TO HIGH CONCENTRATIONS OF TRITIUM GAS.*	051403 P 28
OF THE SKIN AND FAT OF MAN FOLLOWING EIGHT MONTHS@ CHRONIC	EXPOSURE TO HTO IN BODY FLUIDS.* IN THE ORGANIC COMPONENTS	051407 P 28
#EVALUATION OF LONG TERM EFFECTS OF	EXPOSURE TO INTERNALLY DEPOSITED RADIONUCLIDES*	066331 P 48
TO THE ATMOSPHERE* #RADIATION	EXPOSURE TO MAN FROM DISPOSAL OF TRITITIATED WATER VAPOR	057580 P 32
#DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM	EXPOSURE TO TRITIATED WATER VAPOR*	070396 P 50
OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF	EXPOSURE TO TRITIUM OXIDE* #EFFECT	064778 P 44
@INDIRECT METHODS OF ESTIMATING RADIONUCLIDE BODY BURDEN OR	EXPOSURE*	007790 P 5
LABORATORIES* #THE MEASUREMENT OF HIGH LEVELS OF RADIATION	EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER NUCLEAR	006997 P 2
@METHODS OF ESTIMATING POPULATION	EXPOSURES FROM PLOWSHARE APPLICATIONS*	041584 P 17
#ANALYSIS OF EXTERNAL RADIATION	EXPOSURES IN 1965*	011919 P 7
#ANALYSIS OF EXTERNAL RADIATION	EXPOSURES IN 1966*	017335 P 10
#ANALYSIS OF RADIATION	EXPOSURES IN 1967*	027860 P 13
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM	EXPOSURES*	031417 P 16
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM	EXPOSURES*	023261 P 11
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM	EXPOSURES*	049713 P 27
AND THEIR BIOL ACTION ON THE FETUS* #	EXPTL STUDY OF RADIONUCLIDE TRANSFER THROUGH THE PLACENTA	049527 P 24
#ANALYSIS OF	EXTERNAL RADIATION EXPOSURES IN 1965*	011919 P 7
#ANALYSIS OF	EXTERNAL RADIATION EXPOSURES IN 1966*	017335 P 10
OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA	FABA) AS A TEST SYSTEM.* RELATIVE BIOLOGICAL EFFECTIVENESS	051314 P 28
#THE QUALITY	FACTOR FOR LOW-ENERGY BETA-EMITTERS*	049712 P 27
#THE QUALITY	FACTOR FOR LOW-ENERGY BETA-EMITTERS*	025635 P 12
#	FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS*	082319 P 55
@RADIOACTIVE	FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE*	061130 P 33
OF TRITIUM IN THE ORGANIC COMPONENTS OF THE SKIN AND	FAT OF MAN FOLLOWING EIGHT MONTHS@ CHRONIC EXPOSURE TO HTO	051407 P 28
CYCLOPENTYL ETHER IN PATIENTS WITH BILE FISTULAS* #	FATE OF INGESTED RADIOLABELED ETHYNYLESTRADIOL AND ITS 3-	049517 P 23
@METABOLISM AND	FATE OF TRITIATED THYMIDINE IN MAN (T7585)*	064747 P 39
TRITIATED WATER (T7599)* #	FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN	064769 P 42
#AGE-DEPENDENT MODELS FOR ESTIMATING INTERNAL DOSE IN	FEASIBILITY EVALUATIONS OF PLOWSHARE EVENTS. PLOWSHARE	027868 P 13
#JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE,	FEB. 20, 1967*	015081 P 8
#SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN	FETAL DEVELOPMENT*	049533 P 24
RATS IN PERIODS #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO	FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF	049639 P 26
TRANSFER THROUGH THE PLACENTA AND THEIR BIOL ACTION ON THE	FETUS* #EXPTL STUDY OF RADIONUCLIDE	049527 P 24
INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN	FIBROBLASTS* ABERATIONS RESULTING FROM 3H-THYMIDINE	041900 P 17
#THE WORK OF INTERNATIONAL ORGANIZATIONS IN THE	FIELD OF RADIOLOGY*	065198 P 47
#ENVIRONMENTAL QUALITY,	FIRST ANNUAL REPORT OF COUNCIL ON ENVIRONMENTAL QUALITY*	065195 P 46
AND ITS 3-CYCLOPENTYL ETHER IN PATIENTS WITH BILE	FISTULAS* #FATE OF INGESTED RADIOLABELED ETHYNYLESTRADIOL	049517 P 23
#ESTIMATES OF DOSE EQUIVALENTS FROM	FIVE INDIVIDUALS WORKING WITH VARIOUS TRITIUM COMPOUNDS*	082354 P 56
MAN FOLLOWING EIGHT MONTHS@ CHRONIC EXPOSURE TO HTO IN BODY	FLUIDS.* IN THE ORGANIC COMPONENTS OF THE SKIN AND FAT OF	051407 P 28
@RADIATION DOSES RESULTING FROM ADMINISTRATION OF TRITIATED	FOLIC ACID AND TRITIATED WATER IN THE RAT*	062623 P 34
AND ELECTROLYTES ACROSS GRANULATION TISSUE IN PATIENTS	FOLLOWING BURNS* #TRANSFER OF WATER	043246 P 19
IN THE ORGANIC COMPONENTS OF THE SKIN AND FAT OF MAN	FOLLOWING EIGHT MONTHS@ CHRONIC EXPOSURE TO HTO IN BODY	051407 P 28
#URINARY EXCRETION OF TRITIUM	FOLLOWING EXPOSURE OF MAN TO HTO - A TWO EXPONENTIAL MODEL*	049605 P 25
WATER VAPOR* #DOSE TO MAN VIA	FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED	070396 P 50
#TRITIUM CONCENTRATIONS IN	FOOD, 1967-1968*	045385 P 22
IN THE RELEASE AND INCORPORATION OF RADIOACTIVE MATERIALS.	FOURTH ANNUAL MEETING OF THE ASSOCIATION OF SPECIALISTS	048419 P 23
#SPEECH BY PAUL C. TOMPLINS, EX. DIR.,	FRC*	065296 P 47
EXPOSURE IN STABLE OR REGENERATED ATMOSPHERES (IN	FRENCH)* AND TRITATED WATER- TIME LIMITS OF ACCIDENTAL	028579 P 14
BIOLOGICAL HALF-LIFE OF TRITIUM* #	FURTHER STUDIES ON THE LONG-TERM EVALUATION OF THE	076703 P 53
OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60	GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (T7605)*	064772 P 42
OF TRITIATED THYMIDINE, TRITIATED WATER, AND COBALT-60	GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS.*	054639 P 30
#JCAE ROUND TWO - THE SCIENTIFIC	GAMUT*	056410 P 31
#CALVERT CLIFFS, BALTIMORE	GAS AND ELECTRIC CO.*	044109 P 21
RISKS RELATIVE TO THE DISTRIBUTION OF CONTAMINATED	GAS* #RADIOLOGICAL	075915 P 53
OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL	GAS* #RELATIVE RADIOLOGICAL IMPORTANCE	077143 P 54
EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF TRITIUM	GAS.* #BIOLOGICAL	051402 P 28
WITH ACUTE EXPOSURE TO HIGH CONCENTRATIONS OF TRITIUM	GAS.*A THEORETICAL CONSIDERATION OF THE HAZARDS ASSOCIATED	051403 P 28
#THE MAXIMUM PERMISSIBLE CONCENTRATION OF	GASEOUS TRITIUM IN THE AIR OF INDUSTRIAL PREMISES*	043100 P 18
DOSIMETRY OF TRITIUM IN THE PRESENCE OF INACTIVE OR ACTIVE	GASES)* DE GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE	011635 P 7
TISSUE RADIATION DOSE IN CLINICAL USE OF RADIOACTIVE INERT	GASES, WITH EXAMPLES OF ABSORBED DOSES FROM H-3, KR-85 AND	049585 P 24
#CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE	GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF	011635 P 7
#	GENERAL HANDBOOK FOR RADIATION MONITORING*	007577 P 4
* #ENVIRONMENTAL EFFECTS OF ELECTRIC	GENERATING PLANTS - TESTIMONY BEFORE JCAE BY VICTOR P. BOND	044015 P 21
RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC	GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P.	043979 P 20
#AEC SEEKS TO	GET RECORD STRAIGHT ON TRITIUM*	039699 P 16
@RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF	GOOD PRACTICES*	082792 P 56
#TRANSFER OF WATER AND ELECTROLYTES ACROSS	GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS*	043246 P 19
THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF	GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE	064759 P 40
#ESTIMATION OF RADIATION PROTECTION	GUIDES - INTERSPECIES CORRELATIONS*	013758 P 8
#DOSIMETRY OF	H-3 AND C-14 COMPOUNDS (T1797)*	067136 P 49

#ACCURACY OF METHODS AND INTERPRETATION OF RESULTS OF H-3 MONITORING* 029220 P 14
PROTECTION ASPECTS* #INTRANUCLEAR H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION 049714 P 27
INERT GASES, WITH EXAMPLES OF ABSORBED DOSES FROM H-3, KR-85 AND XE-133* DOSE IN CLINICAL USE OF RADIOACTIVE 049585 P 24
#OBSERVATIONS OF BIOLOGICAL HALF LIFE OF TRITIUM* 043273 P 19
TRITIATED WATER IN RATS #COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF 047898 P 22
#OBSERVATION OF BIOLOGICAL HALF-LIFE OF TRITIUM (T3681)* 064767 P 41
#BIOLOGICAL HALF-LIFE OF TRITIUM (T7377)* 062563 P 33
#OBSERVED EFFECTIVE HALF-LIFE OF TRITIUM AT THE SAVANNAH RIVER PLANT* 056158 P 30
#LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM* 064779 P 44
#LONG-TERM EVALUATION OF TGE BIOLOGICAL HALF-LIFE OF TRITIUM* 065162 P 46
#OBSERVATION OF BIOLOGICAL HALF-LIFE OF TRITIUM* 007677 P 5
STUDIES ON THE LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM* #FURTHER 076703 P 53
WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL #TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED 049600 P 25
#GENERAL HANDBOOK FOR RADIATION MONITORING* 007577 P 4
#LOS ALAMOS HANDBOOK OF RADIATION MONITORING, 1970* 066510 P 49
#PRELIMINARY ESTIMATE OF THE HAZARD FROM INGESTION OF TRITIATED THYMIDINE* 058835 P 32
#ASSESSING AND CONTROLLING THE HAZARD FROM TRITIATED WATER* 075523 P 52
#THE HAZARD FROM TRITIUM CONTAMINATION* 057579 P 32
SORPTION OF TRITIUM ON BRASS* #THE RADIOLOGICAL HAZARD FROM TRITIUM SORBED ON METAL SURFACES PART I THE 028491 P 14
#EFFECT OF BODY DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO TRITIUM OXIDE* 064778 P 44
HAZARD OF TRITIUM AS A DNA LABEL IN MAN (T1858)* 064740 P 38
T0257)* #RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS (064730 P 36
#THE RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS* 007461 P 4
#STUDY IV-313, HAZARDS ANALYSIS, RADIOLOGICAL HAZARDS* 004672 P 1
#INCORPORATION HAZARDS AND THEIR ESTIMATION* 070413 P 51
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 13
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR* 003269 P 1
CONCENTRATIONS OF #A THEORETICAL CONSIDERATION OF THE HAZARDS ASSOCIATED WITH ACUTE EXPOSURE TO HIGH 051403 P 28
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 41
#INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 19* 007430 P 4
HAZARDS FROM ISOTOPIC TRACERS (T2297)* 064749 P 40
#ASSESSMENT OF POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT RULISON* 002551 P 1
#HEALTH HAZARDS FROM RADIOACTIVE EMISSIONS* 080838 P 55
#THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM.* 052303 P 29
#THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM* 007399 P 3
#EVALUATION OF POTENTIAL HAZARDS FROM TRITIUM WATER* 017134 P 10
#TRITIUM HAZARDS* 019535 P 10
#STUDY IV-313, HAZARDS ANALYSIS, RADIOLOGICAL HAZARDS* 004672 P 1
HEALTH AND SAFETY DIVISION ANNUAL PROGRESS REPORT, 1963* 007507 P 4
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 41
HEALTH HAZARDS FROM RADIOACTIVE EMISSIONS* 080838 P 55
WATER* # HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED 061721 P 33
JANUARY - DECEMBER 1964* # HEALTH PHYSICS AND MEDICAL DIVISION PROGRESS REPORT. 007422 P 3
DEC 1968* # HEALTH PHYSICS AND MEDICAL DIVISION PROGRESS REPORT, JAN - 045597 P 22
REPORT, JANUARY - DECEMBER 1966* # HEALTH PHYSICS AND MEDICAL DIVISION RESEARCH PROGRESS 019434 P 10
HEALTH PHYSICS ASPECTS OF LRL TRITIUM RELEASE* 067941 P 50
RADIATION LABORATORY, LIVERMORE* # HEALTH PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE 082793 P 56
HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING* 064780 P 45
HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING* 049197 P 23
HEALTH PHYSICS ASPECTS OF TRITUIM* 065253 P 47
HEALTH PHYSICS BIBLIOGRAPHY ON TRITIUM* 004650 P 1
ENDING JULY 31, 1965* # HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD 013658 P 8
ENDING JULY 31, 1968* # HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD 030135 P 15
ENDING JULY 31, 1967. PART I. RADIOACTIVE WASTE DISPOSAL* # HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD 021935 P 11
LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31* 066272 P 48
REACTORS* # HEALTH PHYSICS PROBLEMS DUE TO TRITIUM AROUND HEAVY-WATER 043122 P 18
SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL* #REVIEW OF SANDIA 024143 P 12
HEALTH PHYSICS UTILIZATION OF AN IBM 1620 COMPUTER* 006867 P 2
HEALTH PHYSICS* 007862 P 5
#BASIS HEALTH PHYSICS* 024425 P 12
#TRITIUM HEALTH PHYSICS* 082305 P 55
#OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS* 062726 P 35
#ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS* 044471 P 21
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 35
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR* 003269 P 1
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 13
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER* 021995 P 11
#HEALTH PHYSICS PROBLEMS DUE TO TRITIUM AROUND HEAVY-WATER REACTORS* 043122 P 18
#RADIATION SAFETY PRACTICES - OPERATION HENRE* 061931 P 33
#BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS.* 051402 P 28
OF THE HAZARDS ASSOCIATED WITH ACUTE EXPOSURE TO HIGH CONCENTRATIONS OF TRITIUM GAS.* CONSIDERATION 051403 P 28
RADIORESISTANCE USING #CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND 052834 P 29
AT THE CHALK RIVER NUCLEAR LABORATORIES*#THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS 006997 P 2
OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT* #SYMPOSIUM 075576 P 53
#JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 9
#JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967* 015081 P 8
#IONIZING RADIATION. VOL. 1: LEVELS (HPIS/98)* 077017 P 53
#URINARY EXCRETION OF TRITIUM FOLLOWING EXPOSURE OF MAN TO HTO - A TWO EXPONENTIAL MODEL* 049605 P 25
#ABSORPTION OF LIQUID HTO AND HTO VAPOR THROUGH THE SKIN OF MAN.* 051406 P 28
AND FAT OF MAN FOLLOWING EIGHT MONTHS# CHRONIC EXPOSURE TO HTO IN BODY FLUIDS.* IN THE ORGANIC COMPONENTS OF THE SKIN 051407 P 29
#THEORETICAL CONSIDERATIONS OF ACUTE EXPOSURE OF MAN TO HTO OR T*2*O ACTIVITY IN THE ATMOSPHERIC ENVIRONMENT.* 051408 P 28
#ABSORPTION OF LIQUID HTO AND HTO VAPOR THROUGH THE SKIN OF MAN.* 051406 P 28
#ANDREW HULL ON KRYPTON, TRITIUM* 045018 P 22
HUMAN BIOLOGY AND BIOMEDICAL RESEARCH* 026493 P 12
3H-THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS* #CHROMATID ABERATIONS RESULTING FROM 041900 P 17
#THEORETICAL RADIATION DOSE TO THE HUMAN SYSTEM FROM ASSIMILATED TRITIUM* 077833 P 55
#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 38
#UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.* 051967 P 29

#DETERMINATION OF BODY WATER IN HUMANS WITH THE AID OF TRITIUM* 043197 P 19
#EXPERIENCE WITH THE USE OF RADIOACTIVE HYDROGEN IN INDUSTRY* 043306 P 20

IN WATER (MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND 064773 P 42
IN WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 051573 P 29
PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1967. PART I. RADIOACTIVE WASTE DISPOSAL* PHYSICS DIVISION ANNUAL 021935 P 11
#FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS* 082319 P 55
#HEALTH PHYSICS UTILIZATION OF AN IBM 1620 COMPUTER* 006867 P 2
TRITIUM* #CRITICAL ANALYSIS OF ICRP DERIVATION OF MAXIMUM PERMISSIBLE CONCENTRATION OF 049711 P 27
FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE IGENSTION* #RADIATION DOSE 049684 P 26
#ASSESSMENT OF RADIOACTIVITY IN MAN. VOLUME II.* 007411 P 3
#STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.* 051582 P 29
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 072960 P 52
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 070395 P 50
#HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER* 061721 P 33
#BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE* 044674 P 21
85* #RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON- 082780 P 56
STIMULATED NATURAL GAS* #RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY 077143 P 54
IMPORTANCE OF TRITIUM IN THE CIVIL DEFENSE CONTEXT* 067964 P 50
FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES* OF INTERNAL RADIATION DOSE 049700 P 26
FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES* OF INTERNAL RADIATION DOSE 007420 P 3
#CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF 011635 P 7
CONTRIBUTION TO THE DOSIMETRY OF TRITIUM IN THE PRESENCE OF INACTIVE OR ACTIVE GASES)* DE GAZ INACTIFS OU ACTIFS (011635 P 7
#TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.* 010200 P 7
INCORPORATION HAZARDS AND THEIR ESTIMATION* 070413 P 51
#CHROMATID ABERATIONS RESULTING FROM 3H-THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN 041900 P 17
MEETING #RADIATION PROTECTION PROBLEMS IN THE RELEASE AND INCORPORATION OF RADIOACTIVE MATERIALS. FOURTH ANNUAL 048419 P 23
ADMINISTRATION (T2243)* # INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL 064748 P 39
CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* # INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO 064766 P 41
#FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)* 064769 P 42
19* # INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 007430 P 4
EXPOSURE* # INDIRECT METHODS OF ESTIMATING RADIONUCLIDE BODY BURDEN OR 007790 P 5
#ESTIMATES OF DOSE EQUIVALENTS FROM FIVE INDIVIDUALS WORKING WITH VARIOUS TRITIUM COMPOUNDS* 082354 P 56
#MUTATIONS INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.* 051968 P 29
THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (T7605)* OF TRITIATED 064772 P 42
THYMIDINE, TRITIATED WATER, AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS.*COMPARISONS OF TRITIATED 054639 P 30
ON MAXIMUM PERMISSIBLE CONCENTRATION IN AIR OF INDUSTRIAL PREMISES FOR TRITIUM OXIDE* #RECOMMENDATIONS 062587 P 34
PERMISSIBLE CONCENTRATION OF GASEOUS TRITIUM IN THE AIR OF INDUSTRIAL PREMISES* #THE MAXIMUM 043100 P 18
#RADIATION DOSES RECEIVED BY WORKERS USING TRITIUM IN INDUSTRY* 048519 P 23
#EXPERIENCE WITH THE USE OF RADIOACTIVE HYDROGEN IN INDUSTRY* 043306 P 20
OF TISSUE RADIATION DOSE IN CLINICAL USE OF RADIOACTIVE INERT GASES, WITH EXAMPLES OF ABSORBED DOSES FROM H-3, KR- 049585 P 24
#THE NITROUS OXIDE DOSIMETER-- INFLUENCE OF CELL DIAMETER ON THE NITROGEN YIELD* 007390 P 2
CYCLOPENTYL ETHER IN PATIENTS WITH BILE FISTULAS* #FATE OF INGESTED RADIOLABELED ETHYNYLESTRADIOL AND ITS 3- 049517 P 23
MAN.* #THE ABSORPTION OF INGESTED TRITIUM WATER AND THE WATER DILUTION VOLUME OF 051405 P 28
#PRELIMINARY ESTIMATE OF THE HAZARD FROM INGESTION OF TRITIATED THYMIDINE* 058835 P 32
#BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS.* 051402 P 28
PHYSICS TRITIUM CONTROL* #REVIEW OF SANDIA SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, AND PROBLEMS IN HEALTH 024143 P 12
#DETERMINATION OF INTERNAL RADIATION DOSES FOR TRITIUM INTAKE (T5547)* 064729 P 36
#RADIATION DOSE DUE TO ACUTE INTAKE OF TRITIUM BY MAN* 071505 P 52
WATER* # INTAKE OF TRITIUM WHEN SKIN IS SPLASHED WITH TRITIATED 042771 P 18
OF COMM 4 ON EVAL OF RADIATION DOSES TO BODY TISSUES FROM INTERNAL CONTAMINATION DUE TO OCCUPATIONAL EXPOSURE (T1000) 064774 P 43
PROLONGED UPTAKES (T1000)* #ASSESSMENT OF INTERNAL CONTAMINATION RESULTING FROM RECURRENT OR 064775 P 43
INTERNAL CONTAMINATION WITH TRITIUM* 060933 P 33
INTERNAL DOSE ESTIMATION* 043153 P 19
EVENTS. PLOWSHARE #AGE-DEPENDENT MODELS FOR ESTIMATING INTERNAL DOSE IN FEASIBILITY EVALUATIONS OF PLOWSHARE 027868 P 13
INTERNAL EXPOSURE OF CHEMIST TO TRITIUM* 026087 P 12
EXCRETION DATA FOR A NUMBER OF IMPORTANT #ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY 049700 P 26
EXCRETION DATA FOR A NUMBER OF IMPORTANT #THE ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY 007420 P 3
#DETERMINATION OF INTERNAL RADIATION DOSES FOR TRITIUM INTAKE (T5547)* 064729 P 36
#EVALUATION OF LONG TERM EFFECTS OF EXPOSURE TO INTERNALLY DEPOSITED RADIONUCLIDES* 066331 P 48
#THE WORK OF INTERNATIONAL ORGANIZATIONS IN THE FIELD OF RADIOLOGY* 065198 P 47
RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I* 016916 P 9
INTERPRETATION OF BIO-ASSAY DATA* 008806 P 6
#ACCURACY OF METHODS AND INTERPRETATION OF RESULTS OF H-3 MONITORING* 029220 P 14
PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND 064773 P 42
CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTIMATED AND 051573 P 29
#ESTIMATION OF RADIATION PROTECTION GUIDES - INTERSPECIES CORRELATIONS* 013758 P 8
#INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* 064766 P 41
#INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (T2243)* 064748 P 39
ABERATIONS RESULTING FROM 3H-THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS* 041900 P 17
#EFFECTS OF INTRACELLULAR IRRADIATION WITH TRITIUM.* 053130 P 30
AND RADIATION PROTECTION ASPECTS* # INTRANUCLEAR H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL 049714 P 27
#RADIATION DOSE CALCULATION IN CELLS CONTAINING INTRANUCLEAR TRITIUM.* 052315 P 29
#RADIOTOXICITY OF INTRANUCLEAR TRITIUM, 125-IODINE AND 131-IODINE* 072215 P 52
INVESTIGATION OF TRITIATED LUMINOUS COMPOUNDS* 065935 P 48
#RADIOTOXICITY OF INTRANUCLEAR TRITIUM, 125- IODINE AND 131-IODINE* 072215 P 52
#RADIOTOXICITY OF INTRANUCLEAR TRITIUM, 125-IODINE AND 131- IODINE* 072215 P 52
IONIZING RADIATION. VOL. 1: LEVELS (HPIS/98)* 077017 P 53
RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN RATS.* #THE 054914 P 30
#SOME EFFECTS ON MAMMALIAN DEVELOPMENT OF CONTINUOUS IRRADIATION IN UTERO WITH TRITIATED WATER* 065122 P 46
JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE #CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF 052834 P 29
#EFFECTS OF INTRACELLULAR IRRADIATION WITH TRITIUM.* 053130 P 30
#INTAKE OF TRITIUM WHEN SKIN IS SPLASHED WITH TRITIATED WATER* 042771 P 18
#DISTRIBUTION AND BIOLOGICAL EFFECTS OF RADIOACTIVE ISOTOPES* 043091 P 18
#HAZARDS FROM ISOTOPIC TRACERS (T2297)* 064749 P 40

#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 33
POTENTIALS IN NORMAL AND #TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND 064759 P 40
#FATE OF INGESTED RADIOLABELED ETHYNYLESTRADIOL AND ITS 3-CYCLOPENTYL ETHER IN PATIENTS WITH BILE FISTULAS* 049517 P 23
#STUDY IV-313, HAZARDS ANALYSIS, RADIOLOGICAL HAZARDS* 004672 P 1

EFFECTS OF PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS*ENVIRONMENTAL 044471 P 21
#HEALTH PHYSICS AND MEDICAL DIVISICN PROGRESS REPORT, JAN - DEC 1968* 045597 P 22
BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31* CHALK RIVER NUCLEAR LABORATORIES, 066272 P 48
#TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967* 015084 P 9
EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL 043979 P 20
EFFECTS OF ELECTRIC GENERATING PLANTS - TESTIMONY BEFORE JCAE BY VICTOR P. BOND* #ENVIRONMENTAL 044015 P 21
JCAE ROUND TWO - THE SCIENTIFIC GAMUT* 056410 P 31
IRRADIATICN OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING 052834 P 29
JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 9
JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967* 015081 P 8

MAN.* #DETERMINATION OF K-42, NA-24, BR-82 AND TRITIATED WATER CONCENTRATION IN 051998 P 29
RADIONUCLIDES #A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF 007852 P 5
INERT GASES, WITH EXAMPLES OF ABSORBED DOSES FROM H-3, KR-85 AND XE-133* DOSE IN CLINICAL USE OF RADIOACTIVE 049585 P 24
#THE DOSE TO MAN FROM ATMOSPHERIC KR-85* 077109 P 54
#RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL GAS* 077143 P 54
IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON-85* #RELATIVE RADIOLOGICAL 082780 P 56
#ANDREW HULL ON KRYPTON, TRITIUM* 045018 P 22

ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF #CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU 011635 P 7
#HAZARD OF TRITIUM AS A DNA LABEL IN MAN (T1858)* 064740 P 39
LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM- LABELED AMINO ACIDS* #TOXICITY OF TRITIUM- 040785 P 17
LABELED AMINO ACIDS* #TOXICITY OF TRITIUM- LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM- 040785 P 17
OF GROWTH RATES AND POTENTIALS IN NORMAL AND #TRITIUM- LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY 064759 P 40
EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER NUCLEAR LABORATORIES* #THE MEASUREMENT OF HIGH LEVELS OF RADIATION 006997 P 2
#ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, 066272 P 48
#TRITIUM LABORATORY - STUDY OF THE MAXIMUM POSSIBLE ACCIDENT* 043213 P 19
OF TRITIUM (T7609)* #REVIEW OF LABORATORY ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY 064777 P 44
ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE* #HEALTH PHYSICS 082793 P 56
#SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC* 065420 P 47
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 30
RESULTING FROM 3H-THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN HUMAN FIBROBLASTS* #CHROMATID ABERATIONS 041900 P 17
#HEALTH PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE* 082793 P 56
#CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPCSES* 064733 P 37
#CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPCSES* 064734 P 37
#SOCIOECONOMIC IMPACT OF LOW- LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 072960 P 52
#SOCIOECONOMIC IMPACT OF LOW- LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 070395 P 50
#IONIZING RADIATION. VOL. 1: LEVELS (HPIS/98)* 077017 P 53
CHALK RIVER NUCLEAR LABORATORIES* #THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE 006997 P 2
#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 49
TRITIATED WATER IN #COMPARISON BETWEEN THE BIOLOGICAL HALF- LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF 047898 P 22
#OBSERVATION OF BIOLOGICAL HALF- LIFE OF TRITIUM (T3681)* 064767 P 41
#BIOLOGICAL HALF- LIFE OF TRITIUM (T7377)* 062563 P 33
#OBSERVED EFFECTIVE HALF- LIFE OF TRITIUM AT THE SAVANNAH RIVER PLANT* 056158 P 30
#LONG-TERM EVALUATION OF TGE BIOLOGICAL HALF- LIFE OF TRITIUM* 065162 P 46
#LONG-TERM EVALUATION OF THE BIOLOGICAL HALF- LIFE OF TRITIUM* 064779 P 44
#OBSERVATION OF BIOLOGICAL HALF- LIFE OF TRITIUM* 007677 P 5
#OBSERVATIONS OF BIOLOGICAL HALF LIFE OF TRITIUM* 043273 P 19
STUDIES ON THE LONG-TERM EVALUATION OF THE BIOLOGICAL HALF- LIFE OF TRITIUM* #FURTHER 076703 P 53
THE OFFSPRING OF RATS IN PERIODS OF PRENATAL AND POSTNATAL LIFE* MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF 049639 P 26
HEALTH PHYSICS DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND 066272 P 48
ATMOSPHERES (IN FRENCH)* #TRITIUM AND TRITATED WATER- TIME LIMITS OF ACCIDENTAL EXPOSURE IN STABLE OR REGENERATED 028579 P 14
OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* #INCORPORATION 064766 P 41
#ABSORPTION OF LIQUID HTO AND HTO VAPOR THROUGH THE SKIN OF MAN.* 051406 P 28
#CHEMICAL COMPOSITICN OF BRAIN, LIVER, PANCREAS (T1510)* 064743 P 39
OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE* #HEALTH PHYSICS ASPECTS 082793 P 56
TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL #TRITIUM UPTAKE HALF- LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH 049600 P 25
RADIONUCLIDES* #EVALUATION OF LONG TERM EFFECTS OF EXPOSURE TO INTERNALLY DEPOSITED 066331 P 48
* # LONG-TERM EVALUATION OF TGE BIOLOGICAL HALF-LIFE OF TRITIUM 065162 P 46
* # LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM 064779 P 44
* #FURTHER STUDIES ON THE LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM 076703 P 53
# LOS ALAMOS HANDBOOK OF RADIATION MONITORING, 1970* 066510 P 49
OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS 054897 P 30
#THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS* 049712 P 27
#THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS* 025635 P 12
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 070395 P 50
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE ENVIRONMENT* 072960 P 52
#HEALTH PHYSICS ASPECTS OF LRL TRITIUM RELEASE* 067941 P 50
WORKERS* #USE OF RADIOACTIVE LUMINOUS COMPOUND AND NEED FOR BIOLOGICAL MONITORING OF 064784 P 45
OR WORKERS* #THE USAGE OF RADIOACTIVE LUMINOUS COMPOUND AND THE NEED FOR BIOLOGICAL MONITORING 020666 P 10
#COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND 047898 P 22
#RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS (T0257)* 064730 P 36
#INVESTIGATION OF TRITIATED LUMINOUS COMPOUNDS* 065935 P 48
#THE RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS* 007461 P 4

#HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING* 049197 P 23
#HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING* 064780 P 45
#TRITIUM ACTIVITY IN URINE FROM LUMINOUS DIAL WRIST WATCHES* 071195 P 51

#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (T0226)* 064727 P 35
USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (T2297)* TOXICITY AND 064759 P 40
WITH TRITIATED WATER* #SOME EFFECTS ON MAMMALIAN DEVELOPMENT OF CONTINUOUS IRRADIATION IN UTERO 065122 P 46
#SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL DEVELOPMENT* 049533 P 24
#COMPARATIVE METABOLISM OF TRITIATED WATER BY MAMMALS* 043593 P 20
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (T0226)* 064728 P 35
#HAZARD OF TRITIUM AS A DNA LABEL IN MAN (T1858)* 064740 P 38
#METABOLISM AND FATE OF TRITIATED THYMIDINE IN MAN (T7585)* 064747 P 39
RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (T2297)* AND USE IN STUDY OF GROWTH 064759 P 40
#SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT* 075576 P 53
#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 49
OF TRITIUM IN THE ORGANIC COMPONENTS OF THE SKIN AND FAT OF MAN FOLLOWING EIGHT MONTHS@ CHRONIC EXPOSURE TO HTO IN 051407 P 28
#THE DOSE TO MAN FROM ATMOSPHERIC KR-85* 077309 P 54
ATMOSPHERE* #RADIATION EXPOSURE TO MAN FROM DISPOSAL OF TRITITIATED WATER VAPOR TO THE 057580 P 32
#URINARY EXCRETION OF TRITIUM FOLLOWING EXPOSURE OF MAN TO HTO - A TWO EXPONENTIAL MODEL* 049605 P 25
#THEORETICAL CONSIDERATIONS OF ACUTE EXPOSURE OF MAN TO HTO OR T*2*O ACTIVITY IN THE ATMOSPHERIC 051408 P 28
TRITIATED WATER VAPOR* #DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO 070396 P 50
#RADIATION DOSE DUE TO ACUTE INTAKE OF TRITIUM BY MAN* 071505 P 52
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN* 044224 P 21
#ASSESSMENT OF TRITIUM IN MAN* 049550 P 24
#ASSESSMENT OF TRITIUM IN MAN* 031065 P 15
#ASSESSMENT OF RADIOACTIVITY IN MAN. VOLUME II.* 007411 P 3
#ABSORPTION OF LIQUID HTO AND HTO VAPOR THROUGH THE SKIN OF MAN.* 051406 P 28
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN.* 051404 P 28
OF K-42, NA-24, BR-82 AND TRITIATED WATER CONCENTRATION IN MAN.* #DETERMINATION 051998 P 29
OF INGESTED TRITIUM WATER AND THE WATER DILUTION VOLUME OF MAN.* #THE ABSORPTION 051405 P 28
#RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD PRACTICES* 082792 P 56
#Y-12 RADIATION SAFETY MANUAL* 007363 P 2
AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY 066272 P 48
PROBLEMS IN THE RELEASE AND INCORPORATION OF RADIOACTIVE MATERIALS. FOURTH ANNUAL MEETING OF THE ASSOCIATION OF 048419 P 23
FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF #EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W 064773 P 42
#CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* 064733 P 37
#CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* 064734 P 37
FROM A NUCLEAR PLANT. II* #THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR 008708 P 6
TRITIATED THYMIDINE* # MAXIMUM PERMISSIBLE CONCENTRATION FOR TRITIATED WATER AND 061912 P 32
PREMISES FOR TRITIUM OXIDE* #RECOMMENDATIONS ON MAXIMUM PERMISSIBLE CONCENTRATION IN AIR OF INDUSTRIAL 062587 P 34
THE AIR OF INDUSTRIAL PREMISES* #THE MAXIMUM PERMISSIBLE CONCENTRATION OF GASEOUS TRITIUM IN 043100 P 18
#CRITICAL ANALYSIS OF ICRP DERIVATION OF MAXIMUM PERMISSIBLE CONCENTRATION OF TRITIUM* 049711 P 27
IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS* # MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOACTIVE NUCLIDES 007226 P 2
WATER (MPC)*W* FROM INTERSPECIES #ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN 051573 P 29
AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (T1643)* # MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN 064776 P 43
#TRITIUM LABORATORY - STUDY OF THE MAXIMUM POSSIBLE ACCIDENT* 043213 P 19
OF TRITIUM CONCENTRATION IN EXHALED WATER VAPOR AS A MEANS OF ESTIMATING BODY BURDEN* #MEASUREMENT 036557 P 16
#MEASUREMENT OF TRITIUM CONCN IN EXHALED WATER VAPOUR AS A MEANS OF ESTIMATING BODY BURDENS* 064782 P 45
INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND TRITIUM.* (MPC)*W* FROM 051573 P 29
FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND TRITIUM (T1643)*WATER (MPC)W 064773 P 42
REPORT OF METHODS AT THE CHALK RIVER NUCLEAR #THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A 006997 P 2
VAPOR AS A MEANS OF ESTIMATING BODY BURDEN* # MEASUREMENT OF TRITIUM CONCENTRATION IN EXHALED WATER 036557 P 16
MEANS OF ESTIMATING BODY BURDENS* # MEASUREMENT OF TRITIUM CONCN IN EXHALED WATER VAPOUR AS A 064782 P 45
#TRITIUM MEASUREMENTS IN RADIATION PROTECTION* 031396 P 15
#HEALTH PHYSICS AND MEDICAL DIVISION PROGRESS REPORT. JANUARY - DECEMBER 1964* 007422 P 3
#HEALTH PHYSICS AND MEDICAL DIVISION PROGRESS REPORT, JAN - DEC 1968* 045597 P 22
DECEMBER 1966* #HEALTH PHYSICS AND MEDICAL DIVISION RESEARCH PROGRESS REPORT, JANUARY - 019434 P 10
AND INCORPORATION OF RADIOACTIVE MATERIALS. FOURTH ANNUAL MEETING OF THE ASSOCIATION OF SPECIALISTS FOR RADIATION 048419 P 23
IMPORTANT #ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF 049700 P 26
IMPORTANT #THE ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF 007420 P 3
COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.*@STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. 051582 P 29
@ METABOLISM AND FATE OF TRITIATED THYMIDINE IN MAN (T7585)* 064747 P 39
#COMPARATIVE METABOLISM OF TRITIATED WATER BY MAMMALS* 043593 P 20
#THE RADIOLOGICAL HAZARD FROM TRITIUM SORBED ON METAL SURFACES PART I THE SORPTION OF TRITIUM ON BRASS* 028491 P 14
#ACCURACY OF METHODS AND INTERPRETATION OF RESULTS OF H-3 MONITORING* 029220 P 14
OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER NUCLEAR LABORATORIES* 006997 P 2
APPLICATIONS* # METHODS OF ESTIMATING POPULATION EXPOSURES FROM PLOWSHARE 041584 P 17
@INDIRECT METHODS OF ESTIMATING RADIONUCLIDE BODY BURDEN OR EXPOSURE* 007790 P 5
FOR THE DETERMINATION OF RADIONUCLIDES IN #A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY 007852 P 5
RADIATION DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2- METHYL-1,4-NAPHTHAQUINOL DIPHOSPHATE*UPTAKE HALF-LIVES AND 049600 P 25
BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM 054897 P 30
FOLLOWING EXPOSURE OF MAN TO HTO - A TWO EXPONENTIAL MODEL* #URINARY EXCRETION OF TRITIUM 049605 P 25
EVALUATIONS OF PLOWSHARE EVENTS. PLOWSHARE #AGE-DEPENDENT MODELS FOR ESTIMATING INTERNAL DOSE IN FEASIBILITY 027868 P 13
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR* 003269 P 1
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 13
#ELK RIVER REACTOR SYSTEM MONITORING DATA* 043571 P 20
#RAPID MONITORING OF TRITIUM AND C-14 IN URINE* 029671 P 14
OF RADIOACTIVE LUMINOUS COMPOUND AND NEED FOR BIOLOGICAL MONITORING OF WORKERS* #USE 064784 P 45
RADIOACTIVE LUMINOUS COMPOUND AND THE NEED FOR BIOLOGICAL MONITORING OR WORKERS* #THE USAGE OF 020666 P 10
#ACCURACY OF METHODS AND INTERPRETATION OF RESULTS OF H-3 MONITORING* 029220 P 14
#GENERAL HANDBOOK FOR RADIATION MONITORING* 007577 P 4
#LOS ALAMOS HANDBOOK OF RADIATION MONITORING, 1970* 066510 P 49
COMPONENTS OF THE SKIN AND FAT OF MAN FOLLOWING EIGHT MONTHS@ CHRONIC EXPOSURE TO HTO IN BODY FLUIDS.* ORGANIC 051407 P 28
OFFSPRING OF RATS IN #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE 049639 P 26
#EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (T2297)* 064741 P 38

#MUTATIONS INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.* 051968 P 29
PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF 051573 P 29
#EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON OF 064773 P 42
MUTATIONS INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.* 051968 P 29

#DETERMINATION OF K-42, NA-24, BR-82 AND TRITIATED WATER CONCENTRATION IN MAN.* 051998 P 29
OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4- NAPHTHAQUINOL DIPHOSPHATE* HALF-LIVES AND RADIATION DOSES 049600 P 25
#RADIATION PROTECTION AT THE NATIONAL NUCLEAR RESEARCH CENTER, PELINDABA* 040379 P 17
OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL GAS* #RELATIVE RADIOLOGICAL IMPORTANCE 077143 P 54
#THE NATURAL RADIATION ENVIRONMENT* 062687 P 34
#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 38
#USE OF RADIOACTIVE LUMINOUS COMPOUND AND NEED FOR BIOLOGICAL MONITORING OF WORKERS* 064784 P 45
#THE USAGE OF RADIOACTIVE LUMINOUS COMPOUND AND THE NEED FOR BIOLOGICAL MONITORING OR WORKERS* 020666 P 10
NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 031417 P 16
NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 023261 P 11
NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 049713 P 27
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION* 014080 P 8
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966* 009302 P 7
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966* 009025 P 6
NITROUS OXIDE DOSIMETER--INFLUENCE OF CELL DIAMETER ON THE NITROGEN YIELD* 007390 P 2
#THE NITROUS OXIDE DOSIMETER--INFLUENCE OF CELL DIAMETER ON THE 007390 P 2
#JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 9
IGENSTION* #RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE 049684 P 26
TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (T2297)* 064759 P 40
#INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 19* 007430 P 4
#BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE* 044674 P 21
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION* 014080 P 8
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 16, 1966* 009302 P 7
#TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, FEBRUARY 24, 1966* 009025 P 6
#FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS* 082319 P 55
CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I* STUDIES RELATED TO PROPOSED 016916 P 9
EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER NUCLEAR LABORATORIES* OF HIGH LEVELS OF RADIATION 006997 P 2
PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, 066272 P 48
PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. II* #THE MAXIMUM 008708 P 6
ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* #AEC COMMENTS 038641 P 16
CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (T1643)* #MAXIMUM PERMISSIBLE 064776 P 43
OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS* #MAXIMUM PERMISSIBLE CONCENTRATIONS 007226 P 2
#RADIATION PROTECTION AT THE NATIONAL NUCLEAR RESEARCH CENTER, PELINDABA* 040379 P 17
RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL GAS* #RELATIVE 077143 P 54
TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* #INCORPORATION OF 064766 P 41
AMINO ACIDS* #TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED 040785 P 17
#DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)* 064753 P 40
T1643)* #MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (064776 P 43
#MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS* 007226 P 2
DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES* OF INTERNAL RADIATION 007420 P 3
DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT RADIONUCLIDES* OF INTERNAL RADIATION 049700 P 26

OBSERVATION OF BIOLOGICAL HALF-LIFE OF TRITIUM (T3681)* 064767 P 41
OBSERVATION OF BIOLOGICAL HALF-LIFE OF TRITIUM* 007677 P 5
OBSERVATIONS OF BIOLOGICAL HALF LIFE OF TRITIUM* 043273 P 19
RIVER PLANT* # OBSERVED EFFECTIVE HALF-LIFE OF TRITIUM AT THE SAVANNAH 056158 P 30
#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 38
DOSES TO BODY TISSUES FROM INTERNAL CONTAMINATION DUE TO OCCUPATIONAL EXPOSURE (T1000)* COMM 4 ON EVAL OF RADIATION 064774 P 43
#QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.* 016512 P 9
MOTHER TO FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN PERIODS OF PRENATAL AND POSTNATAL LIFE 049639 P 26
#QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.* 016512 P 9
#RADIATION SAFETY PRACTICES - OPERATION HENRE* 061931 P 33
#INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (T2243)* 064748 P 39
EIGHT MONTHS@ #THE SPECIFIC ACTIVITY OF TRITIUM IN THE ORGANIC COMPONENTS OF THE SKIN AND FAT OF MAN FOLLOWING 051407 P 28
#THE WORK OF INTERNATIONAL ORGANIZATIONS IN THE FIELD OF RADIOLOGY* 065198 P 47
#TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS* 040785 P 17
A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF TRITIUM IN THE 011635 P 7
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 33
OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS* 062726 P 35
NITROGEN YIELD* #THE NITROUS OXIDE DOSIMETER--INFLUENCE OF CELL DIAMETER ON THE 007390 P 2
DEVELOPMENT OF THE OFFSPRING OF RATS #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF 049639 P 26
DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE IGENSTION* #RADIATION 049684 P 26
#TISSUE DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE TO RABBITS* 067165 P 49
#TRITIUM OXIDE* 075281 P 52
#DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE* 056179 P 31
AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO TRITIUM OXIDE* #EFFECT OF BODY DISTRIB 064778 P 44
CONCENTRATION IN AIR OF INDUSTRIAL PREMISES FOR TRITIUM OXIDE* #RECOMMENDATIONS ON MAXIMUM PERMISSIBLE 062587 P 34
#PERCUTANEOUS ABSORPTION OF TRITIUM OXIDE.* 051628 P 29

GENERATING PLANTS - TESTIMONY BEFORE JCAE BY VICTOR P. BOND* #ENVIRONMENTAL EFFECTS OF ELECTRIC 044015 P 21
GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC 043979 P 20
STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC- PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES. PHASE I 016916 P 9
#HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING* 049197 P 23
#HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING* 064780 P 45

©CHEMICAL COMPOSITION OF BRAIN, LIVER,	PANCREAS (T1510)*	064743 P 39
RADIOLOGICAL HAZARD FROM TRITIUM SORBED ON METAL SURFACES	PART I THE SORPTION OF TRITIUM ON BRASS* #THE	028491 P 14
ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1967.	PART I. RADIOACTIVE WASTE DISPOSAL*HEALTH PHYSICS DIVISION	021935 P 11
OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN	PATIENTS FOLLOWING BURNS* #TRANSFER	043246 P 19
©TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER	.PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL	049600 P 25
ETHYNYLESTRADIOL AND ITS 3-CYCLOPENTYL ETHER IN	PATIENTS WITH BILE FISTULAS*©FATE OF INGESTED RADIOLABELED	049517 P 23
#SPEECH BY	PAUL C. TOMPLINS, EX. DIR., FRC*	065296 P 47
PERIODS #TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND	PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN	049639 P 26
PROTECTION AT THE NATIONAL NUCLEAR RESEARCH CENTER,	PELINDABA* #RADIATION	040379 P 17
#ABSORPTION OF TRITIATED WATER VAPOUR BY	PEOPLE*	056159 P 31
©	PERCUTANEOUS ABSORPTION OF TRITIUM OXIDE.*	051628 P 29
FROM 3H-THYMIDINE INCORPORATION INTO EARLY AND LATE S	PERIODS IN HUMAN FIBROBLASTS* ABERATIONS RESULTING	041900 P 17
PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN	PERIODS OF PRENATAL AND POSTNATAL LIFE*MOTHER TO FETUS AND	049639 P 26
NUCLEAR PLANT. II* #THE MAXIMUM	PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A	008708 P 6
TRITIATED THYMIDINE* #MAXIMUM	PERMISSIBLE CONCENTRATION FOR TRITIATED WATER AND	061912 P 32
FOR TRITIUM OXIDE* #RECOMMENDATIONS ON MAXIMUM	PERMISSIBLE CONCENTRATION IN AIR OF INDUSTRIAL PREMISES	062587 P 34
INDUSTRIAL PREMISES* #THE MAXIMUM	PERMISSIBLE CONCENTRATION OF GASEOUS TRITIUM IN THE AIR OF	043100 P 18
#CRITICAL ANALYSIS OF ICRP DERIVATION OF MAXIMUM	PERMISSIBLE CONCENTRATION OF TRITIUM*	049711 P 27
AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS* #MAXIMUM	PERMISSIBLE CONCENTRATIONS OF RADIOACTIVE NUCLIDES IN	007226 P 2
MPC)*W* FROM INTERSPECIES #ESTIMATION OF MAXIMUM	PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN WATER (	051573 P 29
EFFLUENTS FROM NUCLEAR REACTORS (T1643)* #MAXIMUM	PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE	064776 P 43
INTERSPECIES CORRELATIONS. I. COMPARISON OF #EST OF MAX	PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM	064773 P 42
T7721)* ©	PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (	067088 P 49
#QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE	PERSONNEL.*	016512 P 9
PACIFIC INTEROCEANIC CANAL WITH NUCLEAR EXPLOSIVES.	PHASE I* RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-	016916 P 9
DOSIMETERS* #EFFECT OF ATMOSPHERIC TRITIUM ON	PHOTOGRAPHIC, THERMOLUMINESCENT AND RADIOPHOTOLUMINESCENT,	031061 P 15
DECEMBER 1964* #HEALTH	PHYSICS AND MEDICAL DIVISION PROGRESS REPORT. JANUARY -	007422 P 3
1968* #HEALTH	PHYSICS AND MEDICAL DIVISION PROGRESS REPORT, JAN - DEC	045597 P 22
JANUARY - DECEMBER 1966* #HEALTH	PHYSICS AND MEDICAL DIVISION RESEARCH PROGRESS REPORT,	019434 P 10
#HEALTH	PHYSICS ASPECTS OF LRL TRITIUM RELEASE*	067941 P 50
RADIATION LABORATORY, LIVERMORE* #HEALTH	PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE	082793 P 56
#HEALTH	PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING*	064780 P 45
#HEALTH	PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING*	049197 P 23
#HEALTH	PHYSICS ASPECTS OF TRITUIM*	065253 P 47
#HEALTH	PHYSICS BIBLIOGRAPHY ON TRITIUM*	004650 P 1
JULY 31, 1967. PART I. RADIOACTIVE WASTE DISPOSAL* #HEALTH	PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING	021935 P 11
JULY 31, 1965* #HEALTH	PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING	013658 P 8
JULY 31, 1968* #HEALTH	PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING	030135 P 15
CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH	PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*	066272 P 48
* #HEALTH	PHYSICS PROBLEMS DUE TO TRITIUM AROUND HEAVY-WATER REACTORS	043122 P 18
ON INSTRUMENTATION, EXPERIENCE, AND PROBLEMS IN HEALTH	PHYSICS TRITIUM CONTROL* #REVIEW OF SANDIA SYMPOSIUM	024143 P 12
#HEALTH	PHYSICS UTILIZATION OF AN IBM 1620 COMPUTER*	006867 P 2
#HEALTH	PHYSICS*	007862 P 5
©BASIS HEALTH	PHYSICS*	024425 P 12
©TRITIUM HEALTH	PHYSICS*	082305 P 55
#OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH	PHYSICS*	062726 P 35
©	PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (T0226)*	064727 P 35
©	PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (T0226)*	064728 P 35
©	PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN.*	051404 P 28
©	PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN*	044224 P 21
#EXPTL STUDY OF RADIONUCLIDE TRANSFER THROUGH THE	PLACENTA AND THEIR BIOL ACTION ON THE FETUS*	049527 P 24
©CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER	PLANT*	064768 P 41
EFFECTIVE HALF-LIFE OF TRITIUM AT THE SAVANNAH RIVER	PLANT* #OBSERVED	056158 P 30
ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR	PLANT. II* #THE MAXIMUM PERMISSIBLE	008708 P 6
#ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING	PLANTS - TESTIMONY BEFORE JCAE BY VICTOR P. BOND*	044015 P 21
#ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING	PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD*	043979 P 20
RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER	PLANTS* #AEC COMMENTS ON TRITIUM	038641 P 16
#METHODS OF ESTIMATING POPULATION EXPOSURES FROM	PLOWSHARE APPLICATIONS*	041584 P 17
FOR ESTIMATING INTERNAL DOSE IN FEASIBILITY EVALUATIONS OF	PLOWSHARE EVENTS. PLOWSHARE RESEARCH AND DEVELOPMENT	027868 P 13
DOSE IN FEASIBILITY EVALUATIONS OF PLOWSHARE EVENTS.	PLOWSHARE RESEARCH AND DEVELOPMENT PROGRESS REPORT,	027868 P 13
#METHODS OF ESTIMATING	POPULATION EXPOSURES FROM PLOWSHARE APPLICATIONS*	041584 P 17
#TRITIUM LABORATORY - STUDY OF THE MAXIMUM	POSSIBLE ACCIDENT*	043213 P 19
ABSORBED ON TITANIUM* #THE	POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES	007399 P 3
ABSORBED ON TITANIUM.* #THE	POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES	052303 P 29
OF THE OFFSPRING OF RATS IN PERIODS OF PRENATAL AND	POSTNATAL LIFE* TO FETUS AND PECULIARITIES OF DEVELOPMENT	049639 P 26
#ASSESSMENT OF	POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT RULISON*	002551 P 1
#EVALUATION OF	POTENTIAL HAZARDS FROM TRITIUM WATER*	017134 P 10
- ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND	POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND	064759 P 40
#CONCENTRATIONS MAXIMALES ADMISSIBLES	POUR LE TRITIUM ET SES COMPOSES*	064734 P 37
#CONCENTRATIONS MAXIMALES ADMISSIBLES	POUR LE TRITIUM ET SES COMPOSES*	064733 P 37
CONGRESS* #ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC	POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST	044471 P 21
TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR	POWER PLANTS* #AEC COMMENTS ON	038641 P 16
#TRITIUM IN	POWER REACTORS*	037466 P 16
#RADIATION SAFETY	PRACTICES - OPERATION HENRE*	061931 P 33
#RADIATION PROTECTION	PRACTICES FOR TRITIUM. A MANUAL OF GOOD PRACTICES*	082792 P 56
PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD	PRACTICES* #RADIATION	082792 P 56
TRITIATED THYMIDINE* ©	PRELIMINARY ESTIMATE OF THE HAZARD FROM INGESTION OF	058835 P 32
ON MAXIMUM PERMISSIBLE CONCENTRATION IN AIR OF INDUSTRIAL	PREMISES FOR TRITIUM OXIDE* #RECOMMENDATIONS	062587 P 34
CONCENTRATION OF GASEOUS TRITIUM IN THE AIR OF INDUSTRIAL	PREMISES* #THE MAXIMUM PERMISSIBLE	043100 P 18
OF DEVELOPMENT OF THE OFFSPRING OF RATS IN PERIODS OF	PRENATAL AND POSTNATAL LIFE* TO FETUS AND PECULIARITIES	049639 P 26
DOSIMETRY OF #CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN	PRESENCE DE GAZ INACTIFS OU ACTIFS (CONTRIBUTION TO THE	011635 P 7
OU ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF TRITIUM IN THE	PRESENCE OF INACTIVE OR ACTIVE GASES)* DE GAZ INACTIFS	011635 P 7
#HEALTH PHYSICS	PROBLEMS DUE TO TRITIUM AROUND HEAVY-WATER REACTORS*	043122 P 18
OF SANDIA SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, AND	PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL* #REVIEW	024143 P 12
MATERIALS. FOURTH ANNUAL MEETING OF #RADIATION PROTECTION	PROBLEMS IN THE RELEASE AND INCORPORATION OF RADIOACTIVE	048419 P 23
* ©	PROBLEMS OF RADIATION PROTECTION IN CONNECTION WITH TRITIUM	028925 P 14
* ©	PROBLEMS OF RADIATION PROTECTION IN CONNECTION WITH TRITIUM	021754 P 11
THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF	PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF	044471 P 21

RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE 054897 P 30
#ASSESSMENT OF TRITIUM IN PRODUCTION WORKERS* 049702 P 26
#ASSESSMENT OF POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT RULISON* 002551 P 1
#DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL* 083078 P 57
OF INTERNAL CONTAMINATION RESULTING FROM RECURRENT OR PROLONGED UPTAKES (T1000)* #ASSESSMENT 064775 P 43
#AEC COMMENTS ON TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER PLANTS* 038641 P 16
CANAL WITH NUCLEAR #DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC INTEROCEANIC 016916 P 9
#SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM* 013458 P 7
H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION ASPECTS* #INTRANUCLEAR 049714 P 27
PELINDABA* #RADIATION PROTECTION AT THE NATIONAL NUCLEAR RESEARCH CENTER, 040379 P 17
#ESTIMATION OF RADIATION PROTECTION GUIDES - INTERSPECIES CORRELATIONS* 013758 P 8
#PROBLEMS OF RADIATION PROTECTION IN CONNECTION WITH TRITIUM* 021754 P 11
#PROBLEMS OF RADIATION PROTECTION IN CONNECTION WITH TRITIUM* 028925 P 14
#SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT* 075576 P 53
PRACTICES* #RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF GOOD 082792 P 56
RADIOACTIVE MATERIALS. FOURTH ANNUAL MEETING OF #RADIATION PROTECTION PROBLEMS IN THE RELEASE AND INCORPORATION OF 048419 P 23
#TRITIUM MEASUREMENTS IN RADIATION PROTECTION* 031396 P 15
MEETING OF THE ASSOCIATION OF SPECIALISTS FOR RADIATION PROTECTION, BERLIN, 28-30 MAY 1969* FOURTH ANNUAL 048419 P 23

#THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS* 049712 P 27
#THE QUALITY FACTOR FOR LOW-ENERGY BETA-EMITTERS* 025635 P 12
QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON ENVIRONMENTAL QUALITY* #ENVIRONMENTAL 065195 P 46
QUALITY* #ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON ENVIRONMENTAL 065195 P 46
PERSONNEL.* # QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE 016512 P 9

#TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.* 010200 P 7
DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE TO RABBITS* #TISSUE 067165 P 49
GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC 043979 P 20
INTRANUCLEAR TRITIUM.* # RADIATION DOSE CALCULATION IN CELLS CONTAINING 052315 P 29
RADIATION DOSE DUE TO ACUTE INTAKE OF TRITIUM BY MAN* 071505 P 52
FOR A NUMBER OF IMPORTANT #THE ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA 007420 P 3
FOR A NUMBER OF IMPORTANT #ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA 049700 P 26
TRITIUM OXIDE IGENSTION* # RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER 049684 P 26
WITH EXAMPLES OF ABSORBED DOSES FROM #ASSESSMENT OF TISSUE RADIATION DOSE IN CLINICAL USE OF RADIOACTIVE INERT GASES, 049585 P 24
* #THEORETICAL RADIATION DOSE TO THE HUMAN SYSTEM FROM ASSIMILATED TRITIUM 077833 P 55
#DETERMINATION OF INTERNAL RADIATION DOSES FOR TRITIUM INTAKE (T5547)* 064729 P 36
2-METHYL-1,4-NAPHTHAQUINOL #TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 049600 P 25
INDUSTRY* # RADIATION DOSES RECEIVED BY WORKERS USING TRITIUM IN 048519 P 23
FOLIC ACID AND TRITIATED WATER IN THE RAT* # RADIATION DOSES RESULTING FROM ADMINISTRATION OF TRITIATED 062623 P 34
CONTAMINATION DUE TO #REPORT OF COMM 4 ON EVAL OF RADIATION DOSES TO BODY TISSUES FROM INTERNAL 064774 P 43
#THE NATURAL RADIATION ENVIRONMENT* 062687 P 34
WATER VAPOR TO THE ATMOSPHERE* # RADIATION EXPOSURE TO MAN FROM DISPOSAL OF TRITITIATED 057580 P 32
RIVER NUCLEAR #THE MEASUREMENT OF HIGH LEVELS OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE CHALK 006997 P 2
#ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1965* 011919 P 7
#ANALYSIS OF EXTERNAL RADIATION EXPOSURES IN 1966* 017335 P 10
#ANALYSIS OF RADIATION EXPOSURES IN 1967* 027860 P 13
COMPOUNDS* #THE RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS 007461 P 4
COMPOUNDS (T0257)* # RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS 064730 P 36
#HEALTH PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, LIVERMORE* 082793 P 56
#GENERAL HANDBOOK FOR RADIATION MONITORING* 007577 P 4
#LOS ALAMOS HANDBOOK OF RADIATION MONITORING, 1970* 066510 P 49
H-3 THYMIDINE - DOSIMETRIC, RADIOBICLOGICAL AND RADIATION PROTECTION ASPECTS* #INTRANUCLEAR 049714 P 27
CENTER, PELINDABA* # RADIATION PROTECTION AT THE NATIONAL NUCLEAR RESEARCH 040379 P 17
#ESTIMATION OF RADIATION PROTECTION GUIDES - INTERSPECIES CORRELATIONS* 013758 P 8
#PROBLEMS OF RADIATION PROTECTION IN CONNECTION WITH TRITIUM* 021754 P 11
#PROBLEMS OF RADIATION PROTECTION IN CONNECTION WITH TRITIUM* 028925 P 14
GOOD PRACTICES* # RADIATION PROTECTION PRACTICES FOR TRITIUM. A MANUAL OF 082792 P 56
INCORPORATION OF RADIOACTIVE MATERIALS. FOURTH ANNUAL # RADIATION PROTECTION PROBLEMS IN THE RELEASE AND 048419 P 23
#TRITIUM MEASUREMENTS IN RADIATION PROTECTION* 031396 P 15
FOURTH ANNUAL MEETING OF THE ASSOCIATION OF SPECIALISTS FOR RADIATION PROTECTION, BERLIN, 28-30 MAY 1969* MATERIALS. 048419 P 23
#Y-12 RADIATION SAFETY MANUAL* 007363 P 2
RADIATION SAFETY PRACTICES - OPERATION HENRE* 061931 P 33
#THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA- RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST 051314 P 28
#IONIZING RADIATION, VOL. 1: LEVELS (HPIS/98)* 077017 P 53
#HEALTH HAZARDS FROM RADIOACTIVE EMISSIONS* 080838 P 55
UPTAKE* # RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL 061130 P 33
#EXPERIENCE WITH THE USE OF RADIOACTIVE HYDROGEN IN INDUSTRY* 043306 P 20
#ASSESSMENT OF TISSUE RADIATION DOSE IN CLINICAL USE OF RADIOACTIVE INERT GASES, WITH EXAMPLES OF ABSORBED DOSES 049585 P 24
#DISTRIBUTION AND BIOLOGICAL EFFECTS OF RADIOACTIVE ISOTOPES* 043091 P 18
MONITORING OF WORKERS* #USE OF RADIOACTIVE LUMINOUS COMPOUND AND NEED FOR BIOLOGICAL 064784 P 45
MONITORING OR WORKERS* #THE USAGE OF RADIOACTIVE LUMINOUS COMPOUND AND THE NEED FOR BIOLOGICAL 020666 P 10
PROTECTION PROBLEMS IN THE RELEASE AND INCORPORATION OF RADIOACTIVE MATERIALS. FOURTH ANNUAL MEETING OF THE 048419 P 23
REACTORS* #MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR 007226 P 2
REACTORS (T1643)* #MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR 064776 P 43
PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1967. PART I. RADIOACTIVE WASTE DISPOSAL*#HEALTH PHYSICS DIVISION ANNUAL 021935 P 11
#ASSESSMENT OF RADIOACTIVITY IN MAN. VOLUME II.* 007411 P 3
#INTRANUCLEAR H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION PROTECTION ASPECTS* 049714 P 27
#REVIEW OF LABORATORY ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF TRITIUM (T7609)* 064777 P 44
ENVIRONMENT* #SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS 075576 P 53
#ESTIMATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES 051573 P 29
CORRELATIONS. I. #EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM INTERSPECIES 064773 P 42
IN PATIENTS WITH BILE FISTULAS* #FATE OF INGESTED RADIOLABELED ETHYNYLESTRADIOL AND ITS 3-CYCLOPENTYL ETHER 049517 P 23

PART I THE SORPTION OF TRITIUM ON BRASS* #THE
TITANIUM.* #THE POSSIBLE
TITANIUM* #THE POSSIBLE
#STUDY IV-313, HAZARDS ANALYSIS,
TRITIUM AND KRYPTON-85* #RELATIVE
NUCLEARLY STIMULATED NATURAL GAS* #RELATIVE
CONTAMINATED GAS* #
#THE WORK OF INTERNATIONAL ORGANIZATIONS IN THE FIELD OF
#INDIRECT METHODS OF ESTIMATING
ACTION ON THE FETUS* #EXPTL STUDY OF
KINGDOM ATOMIC ENERGY AUTHORITY FOR THE DETERMINATION OF
OF LONG TERM EFFECTS OF EXPOSURE TO INTERNALLY DEPOSITED
AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT
AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT
ATMOSPHERIC TRITIUM ON PHOTOGRAPHIC, THERMOLUMINESCENT AND
HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND
IODINE* #
#TRITIUM EXPOSURE AT U.S.
#TRITIUM EXPOSURE AT US
#TRITIUM EXPOSURE AT U. S.
#
RECOVERY, AND #CONTINUOUS IRRADIATION OF THE
OF TRITIATED FOLIC ACID AND TRITIATED WATER IN THE
THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH
#CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE
#RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN
TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN
FETUS AND PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF
EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN
OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA
TRITIATED THYMIDINE, TRITIATED WATER, AND COBALT-60 GAMMA
#THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA
#ELK RIVER
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED
OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED
#HEALTH PHYSICS PROBLEMS DUE TO TRITIUM AROUND HEAVY-WATER
#TRITIUM IN POWER
OF RADIOACTIVE NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR
#RADIATION DOSES
AIR OF INDUSTRIAL PREMISES FOR TRITIUM OXIDE* #
#AEC SEEKS TO GET
OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE,
#ASSESSMENT OF INTERNAL CONTAMINATION RESULTING FROM
WATER- TIME LIMITS OF ACCIDENTAL EXPOSURE IN STABLE OR
INTEROCEANIC CANAL WITH NUCLEAR #DOSE-ESTIMATION STUDIES
#REVIEW OF LABORATORY ANIMAL EXPERIMENTS
PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE
RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A #THE
IRON UPTAKE IN RATS.* #THE
RELEASED TRITIUM AND KRYPTON-85* #
IN NUCLEARLY STIMULATED NATURAL GAS* #
#RADIOLOGICAL RISKS
ANNUAL MEETING OF THE #RADIATION PROTECTION PROBLEMS IN THE
#HEALTH PHYSICS ASPECTS OF LRL TRITIUM
#JOHNS HOPKINS UNIVERSITY TRITIUM
#RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY
PLANTS* #AEC COMMENTS ON TRITIUM
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM
#SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM
#HEALTH PHYSICS AND MEDICAL DIVISION PROGRESS
#HEALTH PHYSICS AND MEDICAL DIVISION PROGRESS
#HEALTH PHYSICS AND MEDICAL DIVISION RESEARCH PROGRESS
#THE EFFECTS OF TRITIUM DECAY ON DNA. PROGRESS
EVENTS. PLOWSHARE RESEARCH AND DEVELOPMENT PROGRESS
#HEALTH AND SAFETY DIVISION ANNUAL PROGRESS
#INDEX TO HAZARDS CONTROL QUARTERLY
IN FEASIBILITY EVALUATIONS OF PLOWSHARE EVENTS. PLOWSHARE
#RADIATION PROTECTION AT THE NATIONAL NUCLEAR
#HEALTH PHYSICS AND MEDICAL DIVISION
#HUMAN BIOLOGY AND BIOMEDICAL
TRITIATED WATER IN THE RAT* #RADIATION DOSES
#DOSE TO MAN VIA FOOD-CHAIN TRANSFER
#ASSESSMENT OF INTERNAL CONTAMINATION
LATE S PERIODS IN HUMAN FIBROBLASTS* #CHROMATID ABERATIONS
#ACCURACY OF METHODS AND INTERPRETATION OF
* #EFFECT OF BODY DISTRIB AND
WATER (T6865)* #
* #
RADIOBIOLOGY OF TRITIUM (T7609)* #
AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL* #
#DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS
#RADIOLOGICAL
#REVIEW OF CHALK
#REVIEW OF CHALK

RADIOLOGICAL HAZARD FROM TRITIUM SORBED ON METAL SURFACES 028491 P 14
RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON 052303 P 29
RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON 007399 P 3
RADIOLOGICAL HAZARDS* 004672 P 1
RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED 082780 P 56
RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN 077143 P 54
RADIOLOGICAL RISKS RELATIVE TO THE DISTRIBUTION OF 075915 P 53
RADIOLOGY* 065198 P 47
RADIONUCLIDE BODY BURDEN OR EXPOSURE* 007790 P 5
RADIONUCLIDE TRANSFER THROUGH THE PLACENTA AND THEIR BIOL 049527 P 24
RADIONUCLIDES IN URINE* OF THE METHODS USED IN THE UNITED 007852 P 5
RADIONUCLIDES* #EVALUATION 066331 P 48
RADIONUCLIDES* OF INTERNAL RADIATION DOSE FROM METABOLIC 007420 P 3
RADIONUCLIDES* OF INTERNAL RADIATION DOSE FROM METABOLIC 049700 P 26
RADIOPHOTOLUMINESCENT, DOSIMETERS* #EFFECT OF 031061 P 15
RADIORESISTANCE USING TRITIATED THYMIDINE.* OF THE RAT AT 052834 P 29
RADIOTOXICITY OF INTRANUCLEAR TRITIUM, 125-IODINE AND 131- 072215 P 52
RADIOTOXICOLOGY OF TRITIUM AND C-14 COMPOUNDS* 049586 P 25
RADIOTOXICOLOGY OF TRITIUM AND 14-C COMPOUNDS.* 054534 P 30
RADIUM CORP. JAN. 11, 1967* 015084 P 9
RADIUM CORP., DEC. 13, 1966* 015083 P 8
RADIUM CORPORATION, JUNE 2, 1966* 010561 P 7
RAPID MONITORING OF TRITIUM AND C-14 IN URINE* 029671 P 14
RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, 052834 P 29
RAT* #RADIATION DOSES RESULTING FROM ADMINISTRATION 062623 P 34
RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN 064759 P 40
RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND 052834 P 29
RATS AFTER TRITIUM OXIDE IGENSTION* 049684 P 26
RATS AND CATS* BETWEEN THE BIOLOGICAL HALF-LIFE OF A 047898 P 22
RATS IN PERIODS OF PRENATAL AND POSTNATAL LIFE* MOTHER TO 049639 P 26
RATS.* #THE RELATIVE BIOLOGICAL 054914 P 30
RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (T7605)* 064772 P 42
RAYS IN INDUCING CHROMOSOMAL ABERRATIONS.* #COMPARISONS OF 054639 P 30
RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* 054897 P 30
REACTOR SYSTEM MONITORING DATA* 043571 P 20
REACTOR* 003269 P 1
REACTORS (T1643)* #MAXIMUM PERMISSIBLE CONCNS 064776 P 43
REACTORS* 027977 P 13
REACTORS* 043122 P 18
REACTORS* 037466 P 16
REACTORS* #MAXIMUM PERMISSIBLE CONCENTRATIONS 007226 P 2
RECEIVED BY WORKERS USING TRITIUM IN INDUSTRY* 048519 P 23
RECOMMENDATIONS ON MAXIMUM PERMISSIBLE CONCENTRATION IN 062587 P 34
RECOMMENDED DIETARY ALLOWANCES (T2562T2297A)* 064742 P 39
RECORD STRAIGHT ON TRITIUM* 039699 P 16
RECOVERY, AND RADIORESISTANCE USING TRITIATED THYMIDINE.* 052834 P 29
RECURRENT OR PROLONGED UPTAKES (T1000)* 064775 P 43
REGENERATED ATMOSPHERES (IN FRENCH)* #TRITIUM AND TRITATED 028579 P 14
RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC-PACIFIC 016916 P 9
RELATED TO THE RADIOBIOLOGY OF TRITIUM (T7609)* 064777 P 44
RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN 054897 P 30
RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA- 051314 P 28
RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING 054914 P 30
RELATIVE RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY 082780 P 56
RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 077143 P 54
RELATIVE TO THE DISTRIBUTION OF CONTAMINATED GAS* 075915 P 53
RELEASE AND INCORPORATION OF RADIOACTIVE MATERIALS. FOURTH 048419 P 23
RELEASE* 067941 P 50
RELEASE, FEB. 20, 1967* 015081 P 8
RELEASED TRITIUM AND KRYPTON-85* 082780 P 56
RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR POWER 038641 P 16
RELEASES TO THE ENVIRONMENT* 070395 P 50
RELEASES TO THE ENVIRONMENT* 072960 P 52
REPORT, JANUARY - DECEMBER 1964* 007422 P 3
REPORT, JAN - DEC 1968* 045597 P 22
REPORT, JANUARY - DECEMBER 1966* 019434 P 10
REPORT, JUNE 1, 1966 TO DECEMBER 31, 1966.* 053555 P 30
REPORT, OCTOBER 1, 1967-APRIL 1, 1968* OF PLOWSHARE 027868 P 13
REPORT, 1963* 007507 P 4
REPORTS, NOS. 1 THROUGH 19* 007430 P 4
RESEARCH AND DEVELOPMENT PROGRESS REPORT, OCTOBER 1, 1967- 027868 P 13
RESEARCH CENTER, PELINDABA* 040379 P 17
RESEARCH PROGRESS REPORT, JANUARY - DECEMBER 1966* 019434 P 10
RESEARCH* 026493 P 12
RESULTING FROM ADMINISTRATION OF TRITIATED FOLIC ACID AND 062623 P 34
RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* 070396 P 50
RESULTING FROM RECURRENT OR PROLONGED UPTAKES (T1000)* 064775 P 43
RESULTING FROM 3H-THYMIDINE INCORPORATION INTO EARLY AND 041900 P 17
RESULTS OF H-3 MONITORING* 029220 P 14
RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO TRITIUM OXIDE 064778 P 44
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY 064725 P 35
REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER 021995 P 11
REVIEW OF LABORATORY ANIMAL EXPERIMENTS RELATED TO THE 064777 P 44
REVIEW OF SANDIA SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, 024143 P 12
RIO BLANCO AND WAGON WHEEL* 083078 P 57
RISKS RELATIVE TO THE DISTRIBUTION OF CONTAMINATED GAS* 075915 P 53
RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 35
RIVER EXPERIENCE WITH TRITIATED HEAVY WATER* 021995 P 11

OF RADIATION EXPOSURES - A REPORT OF METHODS AT THE CHALK RIVER NUCLEAR LABORATORIES*#THE MEASUREMENT OF HIGH LEVELS 006997 P 2
DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS 066272 P 48
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 41
#OBSERVED EFFECTIVE HALF-LIFE OF TRITIUM AT THE SAVANNAH RIVER PLANT* 056158 P 30
#ELK RIVER REACTOR SYSTEM MONITORING DATA* 043571 P 20
#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 39
EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.* RELATIVE BIOLOGICAL 051314 P 29
#JCAE ROUND TWO - THE SCIENTIFIC GAMUT* 056410 P 31
#ASSESSMENT OF POTENTIAL BIOLOGICAL HAZARDS FROM PROJECT RULISON* 002551 P 1

#TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966* 010561 P 7
#HEALTH AND SAFETY DIVISION ANNUAL PROGRESS REPORT, 1963* 007507 P 4
#Y-12 RADIATION SAFETY MANUAL* 007363 P 2
#RADIATION SAFETY PRACTICES - OPERATION HENRE* 061931 P 33
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 064785 P 46
PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL* #REVIEW OF SANDIA SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, AND 024143 P 12
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 41
#OBSERVED EFFECTIVE HALF-LIFE OF TRITIUM AT THE SAVANNAH RIVER PLANT* 056158 P 30
#TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.* 010200 P 7
#JCAE ROUND TWO - THE SCIENTIFIC GAMUT* 056410 P 31
#AEC SEEKS TO GET RECORD STRAIGHT ON TRITIUM* 039699 P 16
SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF TRITIUM* 013458 P 7
#CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* 064734 P 37
#CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* 064733 P 37
#FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS* 082319 P 55
#QUESTION 15 - TRITIUM CONTROL FOR ON- SITE AND OFF-SITE PERSONNEL.* 016512 P 9
#QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF- SITE PERSONNEL.* 016512 P 9
ACTIVITY OF TRITIUM IN THE ORGANIC COMPONENTS OF THE SKIN AND FAT OF MAN FOLLOWING EIGHT MONTHS@ CHRONIC 051407 P 28
SKIN CONTACT TRANSFER OF TRITIUM FROM BRASS* 008999 P 6
SKIN CONTACT TRANSFER OF TRITIUM FROM BRASS* 006241 P 1
#INTAKE OF TRITIUM WHEN SKIN IS SPLASHED WITH TRITIATED WATER* 042771 P 18
#ABSORPTION OF LIQUID HTO AND HTO VAPOR THROUGH THE SKIN OF MAN.* 051406 P 28
ENVIRONMENT* # SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE 070395 P 50
ENVIRONMENT* # SOCIOECONOMIC IMPACT OF LOW-LEVEL TRITIUM RELEASES TO THE 072960 P 53
POTENTIALS IN NORMAL AND #TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND 064759 P 40
DEVELOPMENT* # SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL 049533 P 24
IRRADIATION IN UTERO WITH TRITIATED WATER* # SOME EFFECTS ON MAMMALIAN DEVELOPMENT OF CONTINUOUS 065122 P 46
BRASS* #THE RADIOLOGICAL HAZARD FROM TRITIUM SORBED ON METAL SURFACES PART I THE SORPTION OF TRITIUM ON 028491 P 14
HAZARD FROM TRITIUM SORBED ON METAL SURFACES PART I THE SORPTION OF TRITIUM ON BRASS* #THE RADIOLOGICAL 028491 P 14
#THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM.* 052303 P 29
#THE POSSIBLE RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM* 007399 P 3
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 33
MATERIALS. FOURTH ANNUAL MEETING OF THE ASSOCIATION OF SPECIALISTS FOR RADIATION PROTECTION, BERLIN, 28-30 MAY 048419 P 23
THE SKIN AND FAT OF MAN FOLLOWING EIGHT MONTHS@ #THE SPECIFIC ACTIVITY OF TRITIUM IN THE ORGANIC COMPONENTS OF 051407 P 28
SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC* 065420 P 47
SPEECH BY PAUL C. TOMPLINS, EX. DIR., FRC* 065296 P 47
#EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (T2297)* 064741 P 39
#INTAKE OF TRITIUM WHEN SKIN IS SPLASHED WITH TRITIATED WATER* 042771 P 18
BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE 054897 P 30
AND TRITATED WATER- TIME LIMITS OF ACCIDENTAL EXPOSURE IN STABLE OR REGENERATED ATMOSPHERES (IN FRENCH)* #TRITIUM 028579 P 14
IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL GAS* #RELATIVE RADIOLOGICAL 077143 P 54
#AEC SEEKS TO GET RECORD STRAIGHT ON TRITIUM* 039699 P 16
III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.* # STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. 051582 P 29
#TOXICOLOGICAL STUDIES OF TRITIATED THYMIDINE.* 052906 P 30
LIFE OF TRITIUM* #FURTHER STUDIES ON THE LONG-TERM EVALUATION OF THE BIOLOGICAL HALF- 076703 P 53
PACIFIC INTEROCEANIC CANAL WITH NUCLEAR #DOSE-ESTIMATION STUDIES RELATED TO PROPOSED CONSTRUCTION OF AN ATLANTIC- 016916 P 9
TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.* #STUDIES OF METABOLIC 051582 P 29
STUDY IV-313, HAZARDS ANALYSIS, RADIOLOGICAL HAZARDS* 004672 P 1
TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND 064759 P 40
#CONTINUOUS IRRADIATION OF THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE 052834 P 29
THEIR BIOL ACTION ON THE FETUS* #EXPTL STUDY OF RADIONUCLIDE TRANSFER THROUGH THE PLACENTA AND 049527 P 24
#TRITIUM LABORATORY - STUDY OF THE MAXIMUM POSSIBLE ACCIDENT* 043213 P 19
#THE RADIOLOGICAL HAZARD FROM TRITIUM SORBED ON METAL SURFACES PART I THE SORPTION OF TRITIUM ON BRASS* 028491 P 14
SURVEY OF AVAILABLE DATA ON TRITIUM (T0915)* 064731 P 36
SURVEY OF AVAILABLE DATA ON TRITIUM (T0915)* 064732 P 37
ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES #A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC 007852 P 5
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 30
AND HIS ENVIRONMENT* # SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN 075576 P 53
HEALTH PHYSICS TRITIUM CONTROL* #REVIEW OF SANDIA SYMPOSIUM ON INSTRUMENTATION, EXPERIENCE, AND PROBLEMS IN 024143 P 12
T75991* #FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (064769 P 42
#THEORETICAL RADIATION DOSE TO THE HUMAN SYSTEM FROM ASSIMILATED TRITIUM* 077833 P 55
#ELK RIVER REACTOR SYSTEM MONITORING DATA* 043571 P 20
RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.* RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA- 051314 P 28
#TRITIUM EXCHANGE IN BIOLOGICAL SYSTEMS* 043103 P 18

CONSIDERATIONS OF ACUTE EXPOSURE OF MAN TO HTO OR T*2*O ACTIVITY IN THE ATMOSPHERIC ENVIRONMENT.*THEORETICAL 051408 P 28
RADIONUCLIDES* #EVALUATION OF LONG TERM EFFECTS OF EXPOSURE TO INTERNALLY DEPOSITED 066331 P 48
#FALLOUT FROM NUCLEAR EXPLOSIONS. I. SHORT TERM EFFECTS* 082319 P 55
#LONG- TERM EVALUATION OF TGE BIOLOGICAL HALF-LIFE OF TRITIUM* 065162 P 46
#LONG- TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM* 064779 P 44
#FURTHER STUDIES ON THE LONG- TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM* 076703 P 53
BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.* RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM 051314 P 28

#ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* 043979 P 20
#ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS - TESTIMONY BEFORE JCAE BY VICTOR P. BOND* 044015 P 21
#LONG-TERM EVALUATION OF TGE BIOLOGICAL HALF-LIFE OF TRITIUM* 065162 P 46
#TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS* 040785 P 17
BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS* BETWEEN THE 047898 P 22
STUDY OF RADIONUCLIDE TRANSFER THROUGH THE PLACENTA AND THEIR BIOL ACTION ON THE FETUS* #EXPTL 049527 P 24
#INCORPORATION HAZARDS AND THEIR ESTIMATION* 070413 P 51
#TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.* 010200 P 7
ACUTE EXPOSURE TO HIGH CONCENTRATIONS OF TRITIUM GAS.* #A THEORETICAL CONSIDERATION OF THE HAZARDS ASSOCIATED WITH 051403 P 28
OR T*2*O ACTIVITY IN THE ATMOSPHERIC ENVIRONMENT.* # THEORETICAL CONSIDERATIONS OF ACUTE EXPOSURE OF MAN TO HTO 051408 P 28
ASSIMILATED TRITIUM* # THEORETICAL RADIATION DOSE TO THE HUMAN SYSTEM FROM 077833 P 55
#EFFECT OF ATMOSPHERIC TRITIUM ON PHOTOGRAPHIC, THERMOLUMINESCENT AND RADIOPHOTOLUMINESCENT, DOSIMETERS* 031061 P 15
#EXPTL STUDY OF RADIONUCLIDE TRANSFER THROUGH THE PLACENTA AND THEIR BIOL ACTION ON THE FETUS* 049527 P 24
#ABSORPTION OF LIQUID HTO AND HTO VAPOR THROUGH THE SKIN OF MAN.* 051406 P 28
#INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 19* 007430 P 4
EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT LOSS IN MICE.* #THE RELATIVE BIOLOGICAL 054897 P 30
#DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)* 064753 P 40
PROTECTION ASPECTS* #INTRANUCLEAR H-3 THYMIDINE - DOSIMETRIC, RADIOBIOLOGICAL AND RADIATION 049714 P 27
GROWTH RATES AND POTENTIALS IN NORMAL AND #TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF 064759 P 40
#TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS* 040785 P 17
#UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.* 051967 P 29
#METABOLISM AND FATE OF TRITIATED THYMIDINE IN MAN (T7585)* 064747 P 39
HUMAN FIBROBLASTS* #CHROMATID ABERATIONS RESULTING FROM 3H- THYMIDINE INCORPORATION INTO EARLY AND LATE S PERIODS IN 041900 P 17
#INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (T2243)* 064748 P 39
#EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (T2297)* 064741 P 38
PERMISSIBLE CONCENTRATION FOR TRITIATED WATER AND TRITIATED THYMIDINE* #MAXIMUM 061912 P 32
ESTIMATE OF THE HAZARD FROM INGESTION OF TRITIATED THYMIDINE* #PRELIMINARY 058835 P 32
#MUTATIONS INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.* 051968 P 29
#TOXICOLOGICAL STUDIES OF TRITIATED THYMIDINE.* 052906 P 30
DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED THYMIDINE.* THE RAT AT HIGH DOSE RATES. A STUDY OF JEJUNAL 052834 P 29
INDUCING CHROMOSOMAL ABERRATIONS (#COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN 064772 P 42
INDUCING CHROMOSOMAL ABERRATIONS.*#COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER, AND COBALT-60 GAMMA RAYS IN 054639 P 30
REGENERATED ATMOSPHERES (IN #TRITIUM AND TRITATED WATER- TIME LIMITS OF ACCIDENTAL EXPOSURE IN STABLE OR 028579 P 14
TO RABBITS* # TISSUE DOSES FROM CHRONIC ADMINISTRATION OF TRITIUM OXIDE 067165 P 49
#TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN PATIENTS FOLLOWING BURNS* 043246 P 19
#FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)# 064769 P 42
OF GROWTH RATES AND POTENTIALS IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (T2297)* AND USE IN STUDY 064759 P 40
GASES, WITH EXAMPLES OF ABSORBED DOSES FROM #ASSESSMENT OF TISSUE RADIATION DOSE IN CLINICAL USE OF RADIOACTIVE INERT 049585 P 24
#REPORT OF COMM 4 ON EVAL OF RADIATION DOSES TO BODY TISSUES FROM INTERNAL CONTAMINATION DUE TO OCCUPATIONAL 064774 P 43
#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (T1858)* 064737 P 38
RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM* #THE POSSIBLE 007399 P 3
RADIOLOGICAL HAZARDS FROM TRITIUM SOURCES ABSORBED ON TITANIUM.* #THE POSSIBLE 052303 P 29
#SPEECH BY PAUL C. TOMPLINS, EX. DIR., FRC* 065296 P 47
#DETERMINATION OF TOTAL BODY WATER WITH TRITIUM OXIDE* 056179 P 31
IN NORMAL AND #TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS 064759 P 40
THYMIDINE AND OF TRITIUM-LABELED AMINO ACIDS* # TOXICITY OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN 040785 P 17
TOXICOLOGICAL STUDIES OF TRITIATED THYMIDINE.* 052906 P 30
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (T0226)* 064727 P 35
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (T0226)* 064728 P 35
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN.* 051404 P 28
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN* 044224 P 21
DEUTERIUM.*#STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND 051582 P 29
#TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966* 009022 P 6
#HAZARDS FROM ISOTOPIC TRACERS (T2297)* 064749 P 40
#SKIN CONTACT TRANSFER OF TRITIUM FROM BRASS* 008999 P 6
#SKIN CONTACT TRANSFER OF TRITIUM FROM BRASS* 006241 P 1
PECULIARITIES OF DEVELOPMENT OF THE OFFSPRING OF RATS IN # TRANSFER OF TRITIUM OXIDE FROM MOTHER TO FETUS AND 049639 P 26
TISSUE IN PATIENTS FOLLOWING BURNS* # TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATION 043246 P 19
#DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* 070396 P 50
FETUS* #EXPTL STUDY OF RADIONUCLIDE TRANSFER THROUGH THE PLACENTA AND THEIR BIOL ACTION ON THE 049527 P 24
TRANSMUTATION EFFECT* 040787 P 17
UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL 049600 P 25
STABLE OR REGENERATED ATMOSPHERES (IN FRENCH)* #TRITIUM AND TRITATED WATER- TIME LIMITS OF ACCIDENTAL EXPOSURE IN 028579 P 14
#RADIATION DOSES RESULTING FROM ADMINISTRATION OF TRITIATED FOLIC ACID AND TRITIATED WATER IN THE RAT* 062623 P 34
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 35
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER* 021995 P 11
IN RATS #COMPARISON BETWEEN THE BIOLOGICAL HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER 047898 P 22
#RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS (T0257)* 064730 P 36
#INVESTIGATION OF TRITIATED LUMINOUS COMPOUNDS* 065935 P 48
#THE RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS* 007461 P 4
#DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (T7595)* 064753 P 40
#UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.* 051967 P 29
#METABOLISM AND FATE OF TRITIATED THYMIDINE IN MAN (T7585)* 064747 P 39
T2243)* #INCORPORATION OF TRITIATED THYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (064748 P 39
#EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (T2297)* 064741 P 38
#TOXICOLOGICAL STUDIES OF TRITIATED THYMIDINE.* 052906 P 30
#MUTATIONS INDUCED IN THE MOUSE WITH TRITIATED THYMIDINE.* 051968 P 29
OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED THYMIDINE.* THE RAT AT HIGH DOSE RATES. A STUDY 052834 P 29
#PRELIMINARY ESTIMATE OF THE HAZARD FROM INGESTION OF TRITIATED THYMIDINE* 058835 P 32
#MAXIMUM PERMISSIBLE CONCENTRATION FOR TRITIATED WATER AND TRITIATED THYMIDINE* 061912 P 32
RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (#COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA 064772 P 42
RAYS IN INDUCING CHROMOSOMAL ABERRATIONS.* #COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER, AND COBALT-60 GAMMA 054639 P 30
#FATTY ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)* 064769 P 42
CHROMOSOMAL #COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING 064772 P 42
#OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS* 062726 P 35
#MAXIMUM PERMISSIBLE CONCENTRATION FOR TRITIATED WATER AND TRITIATED THYMIDINE* 061912 P 32
#COMPARATIVE METABOLISM OF TRITIATED WATER BY MAMMALS* 043593 P 20
#DETERMINATION OF K-42, NA-24, BR-82 AND TRITIATED WATER CONCENTRATION IN MAN.* 051998 P 29

HALF-LIFE OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS* BETWEEN THE BIOLOGICAL 047898 P 22
RESULTING FROM ADMINISTRATION OF TRITIATED FOLIC ACID AND TRITIATED WATER IN THE RAT* #RADIATION DOSES 062623 P 34
ACIDS (T2297)* #INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC 064766 P 41
#SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL DEVELOPMENT* 049533 P 24
TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* #DOSE 070396 P 50
#ABSORPTION OF TRITIATED WATER VAPOUR BY PEOPLE* 056159 P 31
#HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED WATER* 061721 P 33
#ASSESSING AND CONTROLLING THE HAZARD FROM TRITIATED WATER* 075523 P 52
#INTAKE OF TRITIUM WHEN SKIN IS SPLASHED WITH TRITIATED WATER* 042771 P 18
DEVELOPMENT OF CONTINUOUS IRRADIATION IN UTERO WITH TRITIATED WATER* #SOME EFFECTS ON MAMMALIAN 065122 P 46
CHROMOSOMAL #COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER, AND COBALT-60 GAMMA RAYS IN INDUCING 054639 P 30
LIVES AND RADIATION DOSES OF CANCER PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL DIPHOSPHATE* HALF- 049600 P 25
#RADIATION EXPOSURE TO MAN FROM DISPOSAL OF TRITITIATED WATER VAPOR TO THE ATMOSPHERE* 057580 P 32
#SURVEY OF AVAILABLE DATA ON TRITIUM (T0915)* 064732 P 37
#SURVEY OF AVAILABLE DATA ON TRITIUM (T0915)* 064731 P 36
I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND TRITIUM (T1643)* (MPC)W FROM INTERSPECIES CORRELATIONS. 064773 P 42
#OBSERVATION OF BIOLOGICAL HALF-LIFE OF TRITIUM (T3681)* 064767 P 41
#BIOLOGICAL HALF-LIFE OF TRITIUM (T7377)* 062563 P 33
ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLOGY OF TRITIUM (T7609)* #REVIEW OF LABORATORY 064777 P 44
TRITIUM ACTIVITY IN URINE FROM LUMINOUS DIAL WRIST WATCHES* 071195 P 51
#RADIOTOXICOLOGY OF TRITIUM AND C-14 COMPOUNDS* 049586 P 25
#RAPID MONITORING OF TRITIUM AND C-14 IN URINE* 029671 P 14
WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM AND DEUTERIUM.* #STUDIES OF METABOLIC TURNOVER 051582 P 29
#RELATIVE RADIOLOGICAL IMPORTANCE OF TRITIUM AND KRYPTON-85 IN NUCLEARLY STIMULATED NATURAL GAS* 077143 P 54
RADIOLOGICAL IMPORTANCE OF ENVIRONMENTALLY RELEASED TRITIUM AND KRYPTON-85* #RELATIVE 082780 P 56
EXPOSURE IN STABLE OR REGENERATED ATMOSPHERES (IN FRENCH)* # TRITIUM AND TRITATED WATER- TIME LIMITS OF ACCIDENTAL 028579 P 14
#RADIOTOXICOLOGY OF TRITIUM AND 14-C COMPOUNDS.* 054534 P 30
#HEALTH PHYSICS PROBLEMS DUE TO TRITIUM AROUND HEAVY-WATER REACTORS* 043122 P 18
#HAZARD OF TRITIUM AS A DNA LABEL IN MAN (T1858)* 064740 P 38
AND DEUTERIUM.* #STUDIES OF METABOLIC TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE STUDIES WITH TRITIUM 051582 P 29
#OBSERVED EFFECTIVE HALF-LIFE OF TRITIUM AT THE SAVANNAH RIVER PLANT* 056158 P 30
LOSS IN MICE.* #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC WEIGHT 054897 P 30
FABA) AS A TEST #THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA 051314 P 28
TRITIUM BODY BURDEN OF CHILDREN, 1967-1968* 045384 P 22
#RADIATION DOSE DUE TO ACUTE INTAKE OF TRITIUM BY MAN* 071505 P 53
DOSE EQUIVALENTS FROM FIVE INDIVIDUALS WORKING WITH VARIOUS TRITIUM COMPOUNDS* #ESTIMATES OF 082354 P 56
#COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER* 070544 P 51
#COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER* 071194 P 51
ESTIMATING BODY BURDEN* #MEASUREMENT OF TRITIUM CONCENTRATION IN EXHALED WATER VAPOR AS A MEANS OF 036557 P 16
TRITIUM CONCENTRATIONS IN FOOD, 1967-1968* 045385 P 22
ESTIMATING BODY BURDENS* #MEASUREMENT OF TRITIUM CONCN IN EXHALED WATER VAPOUR AS A MEANS OF 064782 P 45
TRITIUM CONTAMINATION AT THEODORE R. SCHWALM, INC.* 010200 P 7
#THE HAZARD FROM TRITIUM CONTAMINATION* 057579 P 32
LIVERMORE* #HEALTH PHYSICS ASPECTS OF TRITIUM CONTROL AT THE LAWRENCE RADIATION LABORATORY, 082793 P 56
#QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.* 016512 P 9
INSTRUMENTATION, EXPERIENCE, AND PROBLEMS IN HEALTH PHYSICS TRITIUM CONTROL* #REVIEW OF SANDIA SYMPOSIUM ON 024143 P 12
DECEMBER 31, 1966.* #THE EFFECTS OF TRITIUM DECAY ON DNA. PROGRESS REPORT, JUNE 1, 1966 TO 053555 P 30
#EFFECTS OF TRITIUM DECAY ON DNA* 065659 P 48
CONTRIBUTION TO THE #CONTRIBUTION A LA DOSIMETRIE DU TRITIUM EN PRESENCE DE GAZ INACTIFS OU ACTIFS (011635 P 7
#CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* 064734 P 37
#CONCENTRATIONS MAXIMALES ADMISSIBLES POUR LE TRITIUM ET SES COMPOSES* 064733 P 37
TRITIUM EXCHANGE IN BIOLOGICAL SYSTEMS* 043103 P 18
TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION* 014080 P 8
FEBRUARY 16, 1966* # TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, 009302 P 7
FEBRUARY 24, 1966* # TRITIUM EXPOSURE AT NEW ENGLAND NUCLEAR CORPORATION, 009025 P 6
TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966* 009022 P 6
TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966* 010561 P 7
TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967* 015084 P 9
TRITIUM EXPOSURE AT US RADIUM CORP., DEC. 13, 1966* 015083 P 9
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 023261 P 11
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 031417 P 16
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 049713 P 27
EXPONENTIAL MODEL* #URINARY EXCRETION OF TRITIUM FOLLOWING EXPOSURE OF MAN TO HTO - A TWO 049605 P 25
#SKIN CONTACT TRANSFER OF TRITIUM FROM BRASS* 008999 P 6
#SKIN CONTACT TRANSFER OF TRITIUM FROM BRASS* 006241 P 1
AND NUCLEIC ACIDS (T2297)* #INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS 064766 P 41
#BIOLOGICAL EFFECTS OF INHALATION OF HIGH CONCENTRATIONS OF TRITIUM GAS.* 051402 P 29
ASSOCIATED WITH ACUTE EXPOSURE TO HIGH CONCENTRATIONS OF TRITIUM GAS.* #A THEORETICAL CONSIDERATION OF THE HAZARDS 051403 P 28
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 13
REACTOR* # TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED 003269 P 1
TRITIUM HAZARDS* 019535 P 10
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 41
TRITIUM HEALTH PHYSICS* 082305 P 55
#THE RELATIVE BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN RATS.* 054914 P 30
#RADIATION DOSES RECEIVED BY WORKERS USING TRITIUM IN INDUSTRY* 048519 P 23
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (T0226)* 064727 P 35
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (T0226)* 064728 P 35
#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 49
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN.* 051404 P 28
#ASSESSMENT OF TRITIUM IN MAN* 049550 P 24
#ASSESSMENT OF TRITIUM IN MAN* 031065 P 15
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN* 044224 P 21
TRITIUM IN POWER REACTORS* 037466 P 16
#ASSESSMENT OF TRITIUM IN PRODUCTION WORKERS* 049702 P 26
#RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER TRITIUM OXIDE IGENSTION* 049684 P 26
#THE MAXIMUM PERMISSIBLE CONCENTRATION OF GASEOUS TRITIUM IN THE AIR OF INDUSTRIAL PREMISES* 043100 P 19
#IMPORTANCE OF TRITIUM IN THE CIVIL DEFENSE CONTEXT* 067964 P 50
MAN FOLLOWING EIGHT MONTHS@ #THE SPECIFIC ACTIVITY OF TRITIUM IN THE ORGANIC COMPONENTS OF THE SKIN AND FAT OF 051407 P 28

DE GAZ INACTIFS CU ACTIFS (CONTRIBUTION TO THE DOSIMETRY OF	TRITIUM IN THE PRESENCE OF INACTIVE OR ACTIVE GASES)*	011635 P 7
#DETERMINATION OF INTERNAL RADIATION DOSES FOR	TRITIUM INTAKE (T5547)*	064729 P 36
* #	TRITIUM LABORATORY - STUDY OF THE MAXIMUM POSSIBLE ACCIDENT	043213 P 19
#HEALTH PHYSICS ASPECTS OF	TRITIUM LUMINOUS DIAL PAINTING*	049197 P 23
#HEALTH PHYSICS ASPECTS OF	TRITIUM LUMINOUS DIAL PAINTING*	064780 P 45
#	TRITIUM MEASUREMENTS IN RADIATION PROTECTION*	031396 P 15
TRITIUM SORBED ON METAL SURFACES PART I THE SORPTION OF	TRITIUM ON BRASS* #THE RADIOLOGICAL HAZARD FROM	028491 P 14
#EFFECT OF BODY DISTRIB AND RETENTION OF	TRITIUM ON HAZARD OF EXPOSURE TO TRITIUM OXIDE*	064778 P 44
RADIOPHOTOLUMINESCENT, DOSIMETERS* #EFFECT OF ATMOSPHERIC	TRITIUM ON PHOTOGRAPHIC, THERMOLUMINESCENT AND	031061 P 15
DEVELOPMENT OF THE OFFSPRING OF RATS IN #TRANSFER OF	TRITIUM OXIDE FROM MOTHER TO FETUS AND PECULIARITIES OF	049639 P 26
#RADIATION DOSE FROM NON-EXCHANGEABLE TRITIUM IN RATS AFTER	TRITIUM OXIDE IGENSTION*	049684 P 26
#TISSUE DOSES FROM CHRONIC ADMINISTRATION OF	TRITIUM OXIDE TO RABBITS*	067165 P 49
#PERCUTANEOUS ABSORPTION OF	TRITIUM OXIDE.*	051628 P 29
#	TRITIUM OXIDE*	075281 P 52
#DETERMINATION OF TOTAL BODY WATER WITH	TRITIUM OXIDE*	056179 P 31
DISTRIB AND RETENTION OF TRITIUM ON HAZARD OF EXPOSURE TO	TRITIUM OXIDE* #EFFECT OF BODY	064778 P 44
PERMISSIBLE CONCENTRATION IN AIR OF INDUSTRIAL PREMISES FOR	TRITIUM OXIDE* #RECOMMENDATIONS ON MAXIMUM	062587 P 34
#HEALTH PHYSICS ASPECTS OF LRL	TRITIUM RELEASE*	067941 P 50
#JOHNS HOPKINS UNIVERSITY	TRITIUM RELEASE, FEB. 20, 1967*	015081 P 8
POWER PLANTS* #AEC COMMENTS ON	TRITIUM RELEASES FROM THE PROPOSED CALVERT CLIFFS NUCLEAR	038641 P 16
#SOCIOECONOMIC IMPACT OF LOW-LEVEL	TRITIUM RELEASES TO THE ENVIRONMENT*	072960 P 52
#SOCIOECONOMIC IMPACT OF LOW-LEVEL	TRITIUM RELEASES TO THE ENVIRONMENT*	070395 P 50
TRITIUM ON BRASS* #THE RADIOLOGICAL HAZARD FROM	TRITIUM SORBED ON METAL SURFACES PART I THE SORPTION OF	028491 P 14
#THE POSSIBLE RADIOLOGICAL HAZARDS FROM	TRITIUM SOURCES ABSORBED ON TITANIUM.*	052303 P 29
#THE POSSIBLE RADIOLOGICAL HAZARDS FROM	TRITIUM SOURCES ABSORBED ON TITANIUM*	007399 P 3
#THE 1971	TRITIUM SYMPOSIUM AT LAS VEGAS*	055111 P 30
#OXIDATION OF	TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS*	062726 P 35
PATIENTS TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL #	TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER	049600 P 25
#THE ABSORPTION OF INGESTED	TRITIUM WATER AND THE WATER DILUTION VOLUME OF MAN.*	051405 P 26
#EVALUATION OF POTENTIAL HAZARDS FROM	TRITIUM WATER*	017134 P 10
#INTAKE OF	TRITIUM WHEN SKIN IS SPLASHED WITH TRITIATED WATER*	042771 P 18
#AEC SEEKS TO GET RECORD STRAIGHT ON	TRITIUM*	039699 P 16
#ANDREW HULL ON KRYPTON,	TRITIUM*	045018 P 22
#OBSERVATIONS OF BIOLOGICAL HALF LIFE OF	TRITIUM*	043273 P 19
#DETERMINATION OF BODY WATER IN HUMANS WITH THE AID OF	TRITIUM*	043197 P 19
#OBSERVATION OF BIOLOGICAL HALF-LIFE OF	TRITIUM*	007677 P 5
#PROBLEMS OF RADIATION PROTECTION IN CONNECTION WITH	TRITIUM*	021754 P 11
#INTERNAL EXPOSURE OF CHEMIST TO	TRITIUM*	026087 P 12
#HEALTH PHYSICS BIBLIOGRAPHY ON	TRITIUM*	004650 P 1
#PROBLEMS OF RADIATION PROTECTION IN CONNECTION WITH	TRITIUM*	028925 P 14
#SEMINAR ON THE PROTECTION AGAINST THE DANGERS OF	TRITIUM*	013458 P 7
#INTERNAL CONTAMINATION WITH	TRITIUM*	060933 P 33
#LONG-TERM EVALUATION OF TGE BIOLOGICAL HALF-LIFE OF	TRITIUM*	065162 P 46
#LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF	TRITIUM*	064779 P 44
#	TRITIUM*	077191 P 54
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND	TRITIUM*	064785 P 46
#CHEMICAL AND BIOLOGICAL EFFECTS OF	TRITIUM*	077199 P 54
RADIATION DOSE TO THE HUMAN SYSTEM FROM ASSIMILATED	TRITIUM* #THEORETICAL	077833 P 55
ON THE LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF	TRITIUM* #FURTHER STUDIES	076703 P 53
OF ICRP DERIVATION OF MAXIMUM PERMISSIBLE CONCENTRATION OF	TRITIUM* #CRITICAL ANALYSIS	049711 P 27
#RADIATION PROTECTION PRACTICES FOR	TRITIUM. A MANUAL OF GOOD PRACTICES*	082792 P 56
#EFFECTS OF INTRACELLULAR IRRADIATION WITH	TRITIUM.*	053130 P 30
RADIATION DOSE CALCULATION IN CELLS CONTAINING INTRANUCLEAR	TRITIUM.* #	052315 P 29
COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND	TRITIUM.*WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I.	051573 P 29
OF TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF	TRITIUM-LABELED AMINO ACIDS* #TOXICITY	040785 P 17
TRITIUM-LABELED AMINO ACIDS* #TOXICITY OF	TRITIUM-LABELED NUCLEOSIDES OTHER THAN THYMIDINE AND OF	040785 P 17
IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND #	TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE	064759 P 40
#RADIOTOXICITY OF INTRANUCLEAR	TRITIUM, 125-IODINE AND 131-IODINE*	072215 P 59
#HEALTH PHYSICS ASPECTS OF	TRITUIM*	065253 P 47
#UPTAKE OF TRITIATED THYMIDINE BY HUMAN	TUMORS IN VIVO.*	051967 P 29
STUDIES WITH TRITIUM AND DEUTERIUM.* #STUDIES OF METABOLIC	TURNOVER WITH TRITIUM AS A TRACER. III. COMPARATIVE	051582 P 29
#JCAE ROUND	TWO - THE SCIENTIFIC GAMUT*	056610 P 31
EXCRETION OF TRITIUM FOLLOWING EXPOSURE OF MAN TO HTO - A	TWO EXPONENTIAL MODEL* #URINARY	049605 P 25
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MA (	T02261*	064727 P 35
#PHYSIOLOGY AND TOXICOLOGY OF TRITIUM IN MAN (	T02261*	064728 P 35
HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS (	T02571* #RADIATION	064730 P 36
#SURVEY OF AVAILABLE DATA ON TRITIUM (	T09151*	064732 P 37
#SURVEY OF AVAILABLE DATA ON TRITIUM (	T09151*	064731 P 36
RESULTING FROM RECURRENT OR PROLONGED UPTAKES (	T10001* #ASSESSMENT OF INTERNAL CONTAMINATION	064775 P 43
FROM INTERNAL CONTAMINATION DUE TO OCCUPATIONAL EXPOSURE (	T10001* COMM 4 ON EVAL OF RADIATION DOSES TO BODY TISSUES	064774 P 43
#CHEMICAL COMPOSITION OF BRAIN, LIVER, PANCREAS (	T15101*	064743 P 39
NUCLIDES IN AIRBORNE EFFLUENTS FROM NUCLEAR REACTORS (	T16431* #MAXIMUM PERMISSIBLE CONCNS OF RADIOACTIVE	064776 P 43
OF ESTD AND MEASURED VALUES FOR ZN-65 AND TRITIUM (	T16431*MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON	064773 P 42
#DOSIMETRY OF H-3 AND C-14 COMPOUNDS (	T17971*	067136 P 49
#HAZARD OF TRITIUM AS A DNA LABEL IN MAN (	T18581*	064740 P 38
#DNA AND RNA CONTENT OF HUMAN TISSUES OBTAINED AT NECROPSY (	T18581*	064737 P 38
OF TRITIATED THYMIDINE INTO DNA AFTER ORAL ADMINISTRATION (	T22431* #INCORPORATION	064748 P 39
#HAZARDS FROM ISOTOPIC TRACERS (	T22971*	064749 P 40
#EFFECT OF TRITIATED THYMIDINE ON MOUSE SPERMATOGONIA (	T22971*	064741 P 38
WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (	T22971* #INCORPORATION OF TRITIUM FROM TRITIATED	064766 P 41
IN NORMAL AND MALIGNANT TISSUE OF MAN AND ANIMALS (	T22971* AND USE IN STUDY OF GROWTH RATES AND POTENTIALS	064759 P 40
#RECOMMENDED DIETARY ALLOWANCES (	T2562T2297A)*	064742 P 39
#OBSERVATION OF BIOLOGICAL HALF-LIFE OF TRITIUM (	T36811*	064767 P 41
OF INTERNAL RADIATION DOSES FOR TRITIUM INTAKE (	T55471* #DETERMINATION	064729 P 36
OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (	T68651* #REVIEW	064725 P 35
#BIOLOGICAL HALF-LIFE OF TRITIUM (	T73771*	062563 P 33
#METABOLISM AND FATE OF TRITIATED THYMIDINE IN MAN (	T75851*	064747 P 39
#DOSE TO THE CELL NUCLEUS FROM TRITIATED THYMIDINE (	T75951*	064753 P 40

SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)* #FATTY ACID 064769 P 42
COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL ABERRATIONS (T7605)* OF TRITIATED THYMIDINE, TRITIATED WATER AND 064772 P 42
ANIMAL EXPERIMENTS RELATED TO THE RADIOBIOLCGY OF TRITIUM (T7609)* #REVIEW OF LABORATORY 064777 P 44
#PERMISSIBLE LEVELS OF TRITIUM IN MAN AND THE ENVIRONMENT (T7721)* 067088 P 49

#TRITIUM EXPOSURE AT U. S. RADIUM CORPORATION, JUNE 2, 1966* 010561 P 7
PRODUCING ELECTRIC POWER - HEARINGS J.C.A.E CONGRESS OF THE U.S. - 91ST CONGRESS* #ENVIRONMENTAL EFFECTS OF 044471 P 21
#TRITIUM EXPOSURE AT U.S. RADIUM CORP. JAN. 11, 1967* 015084 P 9
DETERMINATION OF #A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE 007852 P 5
#JOHNS HOPKINS UNIVERSITY CITED FOR NON COMPLIANCE* 017118 P 9
#JOHNS HOPKINS UNIVERSITY TRITIUM RELEASE, FEB. 20, 1967* 015081 P 8
TREATED WITH TRITIATED 2-METHYL-1,4-NAPHTHAQUINOL #TRITIUM UPTAKE HALF-LIVES AND RADIATION DOSES OF CANCER PATIENTS 049600 P 25
BIOLOGICAL EFFECTIVENESS OF TRITIUM IN DEPRESSING IRON UPTAKE IN RATS.* #THE RELATIVE 054914 P 30
UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.* 051967 P 29
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 33
CONTAMINATION RESULTING FROM RECURRENT OR PROLONGED UPTAKES (T1000)* #ASSESSMENT OF INTERNAL 064775 P 43
#ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT 049700 P 26
ESTIMATION OF INTERNAL RADIATION DOSE FROM METABOLIC AND URINARY EXCRETION DATA FOR A NUMBER OF IMPORTANT 007420 P 3
HTO - A TWO EXPONENTIAL MODEL* # URINARY EXCRETION OF TRITIUM FOLLOWING EXPOSURE OF MAN TO 049605 P 25
#TRITIUM ACTIVITY IN URINE FROM LUMINOUS DIAL WRIST WATCHES* 071195 P 51
#RAPID MONITORING OF TRITIUM AND C-14 IN URINE* 029671 P 14
ENERGY AUTHORITY FOR THE DETERMINATION OF RADIONUCLIDES IN URINE* OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC 007852 P 5
#TRITIUM EXPOSURE AT US RADIUM CORP., DEC. 13, 1966* 015083 P 8
#SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC* 065420 P 47
BIOLOGICAL MONITORING OR WORKERS* #THE USAGE OF RADIOACTIVE LUMINOUS COMPOUND AND THE NEED FOR 020666 P 10
#TRITIUM-LABELED THYMIDINE - ITS SOMATIC TOXICITY AND USE IN STUDY OF GROWTH RATES AND POTENTIALS IN NORMAL AND 064759 P 40
#EXPERIENCE WITH THE USE OF RADIOACTIVE HYDROGEN IN INDUSTRY* 043306 P 20
DOSES FROM #ASSESSMENT OF TISSUE RADIATION DOSE IN CLINICAL USE OF RADIOACTIVE INERT GASES, WITH EXAMPLES OF ABSORBED 049585 P 24
BIOLOGICAL MONITORING OF WORKERS* # USE OF RADIOACTIVE LUMINOUS COMPOUND AND NEED FOR 064784 P 45
DETERMINATION OF RADIONUCLIDES IN #A SURVEY OF THE METHODS USED IN THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY FOR THE 007852 P 5
#RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS (T0257)* 064730 P 36
#THE RADIATION HAZARD TO WORKERS USING TRITIATED LUMINOUS COMPOUNDS* 007461 P 4
A STUDY OF JEJUNAL DAMAGE, RECOVERY, AND RADIORESISTANCE USING TRITIATED THYMIDINE.* OF THE RAT AT HIGH DOSE RATES. 052834 P 29
#RADIATION DOSES RECEIVED BY WORKERS USING TRITIUM IN INDUSTRY* 048519 P 23
ON MAMMALIAN DEVELOPMENT OF CONTINUOUS IRRADIATION IN UTERO WITH TRITIATED WATER* #SOME EFFECTS 065122 P 46
#HEALTH PHYSICS UTILIZATION OF AN IBM 1620 COMPUTER* 006867 P 2

CORRELATIONS. I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR ZINC-65 AND TRITIUM.*(MPC)*W* FROM INTERSPECIES 051573 P 29
CORRELATIONS. I. COMPARISON OF ESTD AND MEASURED VALUES FOR ZN-65 AND TRITIUM (T1643)* FROM INTERSPECIES 064773 P 42
#MEASUREMENT OF TRITIUM CONCENTRATION IN EXHALED WATER VAPOR AS A MEANS OF ESTIMATING BODY BURDEN* 036557 P 14
#ABSORPTION OF LIQUID HTO AND HTO VAPOR THROUGH THE SKIN OF MAN.* 051406 P 29
EXPOSURE TO MAN FROM DISPOSAL OF TRITITIATED WATER VAPOR TO THE ATMOSPHERE* #RADIATION 057580 P 32
CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED WATER VAPOR* #DOSE TO MAN VIA FOOD- 070396 P 50
#MEASUREMENT OF TRITIUM CONCN IN EXHALED WATER VAPOUR AS A MEANS OF ESTIMATING BODY BURDENS* 064782 P 45
#ABSORPTION OF TRITIATED WATER VAPOUR BY PEOPLE* 056159 P 31
OF DOSE EQUIVALENTS FROM FIVE INDIVIDUALS WORKING WITH VARIOUS TRITIUM COMPOUNDS* #ESTIMATES 082354 P 56
#THE 1971 TRITIUM SYMPOSIUM AT LAS VEGAS* 055111 P 30
TRITIATED WATER VAPOR* #DOSE TO MAN VIA FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO 070396 P 50
OF TRITIUM BETA-RADIATION WITH THE BROAD BEAN ROOT (VICIA FABA) AS A TEST SYSTEM.* BIOLOGICAL EFFECTIVENESS 051314 P 28
OF ELECTRIC GENERATING PLANTS - TESTIMONY BEFORE JCAE BY VICTOR P. BOND* #ENVIRONMENTAL EFFECTS 044015 P 21
#UPTAKE OF TRITIATED THYMIDINE BY HUMAN TUMORS IN VIVO.* 051967 P 29
#IONIZING RADIATION. VOL. 1: LEVELS (HPIS/98)* 077017 P 53
#ASSESSMENT OF RADIOACTIVITY IN MAN. VOLUME II.* 007411 P 3
ABSORPTION OF INGESTED TRITIUM WATER AND THE WATER DILUTION VOLUME OF MAN.* #THE 051405 P 28

DIFFUSION AND DOSE CALCULATIONS FOR PROJECTS RIO BLANCO AND WAGON WHEEL* # 083078 P 57
REPORT FOR PERIOD ENDING JULY 31, 1967. PART I. RADIOACTIVE WASTE DISPOSAL* #HEALTH PHYSICS DIVISION ANNUAL PROGRESS 021935 P 11
#TRITIUM ACTIVITY IN URINE FROM LUMINOUS DIAL WRIST WATCHES* 071195 P 51
OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF RADIOISOTOPES IN WATER (MPC)*W* FROM INTERSPECIES CORRELATIONS. I. 051573 P 29
OF ESTD #EST OF MAX PERMISSIBLE CONCNS OF RADIOISOTOPES IN WATER (MPC)W FROM INTERSPECIES CORRELATIONS. I. COMPARISON 064773 P 42
#REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY WATER (T6865)* 064725 P 35
ACID SYNTHESIS IN ADIPOSE TISSUE INCUBATED IN TRITIATED WATER (T7599)* #FATTY 064769 P 42
#COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER* 071194 P 51
#COMPARISON BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY WATER* 070544 P 51
ABERRATIONS (#COMPARISONS OF TRITIATED THYMIDINE, TRITIATED WATER AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL 064772 P 42
PATIENTS FOLLOWING BURNS* #TRANSFER OF WATER AND ELECTROLYTES ACROSS GRANULATION TISSUE IN 043246 P 19
#OXIDATION OF TRITIUM TO TRITIATED WATER AND HEALTH PHYSICS* 062726 P 35
#THE ABSORPTION OF INGESTED TRITIUM WATER AND THE WATER DILUTION VOLUME OF MAN.* 051405 P 28
#MAXIMUM PERMISSIBLE CONCENTRATION FOR TRITIATED WATER AND TRITIATED THYMIDINE* 061912 P 32
#COMPARATIVE METABOLISM OF TRITIATED WATER BY MAMMALS* 043593 P 20
#DETERMINATION OF K-42, NA-24, BR-82 AND TRITIATED WATER CONCENTRATION IN MAN.* 051998 P 29
#THE ABSORPTION OF INGESTED TRITIUM WATER AND THE WATER DILUTION VOLUME OF MAN.* 051405 P 28
#DETERMINATION OF BODY WATER IN HUMANS WITH THE AID OF TRITIUM* 043197 P 19
OF A TRITIATED LUMINOUS COMPOUND WITH THAT OF TRITIATED WATER IN RATS AND CATS* BETWEEN THE BIOLOGICAL HALF-LIFE 047898 P 22
FROM ADMINISTRATION OF TRITIATED FOLIC ACID AND TRITIATED WATER IN THE RAT* #RADIATION DOSES RESULTING 062623 P 34
#INCORPORATION OF TRITIUM FROM TRITIATED WATER INTO CARBOHYDRATES, LIPIDS AND NUCLEIC ACIDS (T2297)* 064766 P 41
#TRITIUM HAZARDS ASSOCIATED WITH A HEAVY WATER MODERATED REACTOR* 003269 P 1
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 13
#SOME EFFECTS OF TRITIATED WATER ON MAMMALIAN FETAL DEVELOPMENT* 049533 P 24

@HEALTH PHYSICS PROBLEMS DUE TO TRITIUM AROUND HEAVY-	WATER REACTORS*	043122 P 18
#MEASUREMENT OF TRITIUM CONCENTRATION IN EXHALED	WATER VAPOR AS A MEANS OF ESTIMATING BODY BURDEN*	036557 P 16
@RADIATION EXPOSURE TO MAN FROM DISPOSAL OF TRITITIATED	WATER VAPOR TO THE ATMOSPHERE*	057580 P 32
FOOD-CHAIN TRANSFER RESULTING FROM EXPOSURE TO TRITIATED	WATER VAPOR* #DOSE TO MAN VIA	070396 P 50
#MEASUREMENT OF TRITIUM CONCN IN EXHALED	WATER VAPOUR AS A MEANS OF ESTIMATING BODY BURDENS*	064782 P 45
#ABSORPTION OF TRITIATED	WATER VAPOUR BY PEOPLE*	056159 P 31
@DETERMINATION OF TOTAL BODY	WATER WITH TRITIUM OXIDE*	056179 P 31
@INTAKE OF TRITIUM WHEN SKIN IS SPLASHED WITH TRITIATED	WATER*	042771 P 18
@EVALUATION OF POTENTIAL HAZARDS FROM TRITIUM	WATER*	017134 P 10
@REVIEW OF CHALK RIVER EXPERIENCE WITH TRITIATED HEAVY	WATER*	021995 P 11
#HEALTH IMPLICATIONS OF ATMOSPHERIC DISCHARGE OF TRITIATED	WATER*	061721 P 33
@ASSESSING AND CONTROLLING THE HAZARD FROM TRITIATED	WATER*	075523 P 52
'BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY	WATER* #COMPARISON	071194 P 51
BETWEEN TRITIUM CONCENTRATION IN DRINKING WATER AND BODY	WATER* #COMPARISON	070544 P 51
OF CONTINUOUS IRRADIATION IN UTERO WITH TRITIATED	WATER* #SOME EFFECTS ON MAMMALIAN DEVELOPMENT	065122 P 46
REGENERATED ATMOSPHERES (IN FRENCH)* #TRITIUM AND TRITATED	WATER- TIME LIMITS OF ACCIDENTAL EXPOSURE IN STABLE OR	028579 P 14
ABERRATIONS.*#COMPARISONS OF TRITIATED THYMIDINE, TRITIATED	WATER, AND COBALT-60 GAMMA RAYS IN INDUCING CHROMOSOMAL	054639 P 30
OF TRITIUM BETA RAYS IN PRODUCING SPLENIC AND THYMIC	WEIGHT LOSS IN MICE.*THE RELATIVE BIOLOGICAL EFFECTIVENESS	054897 P 30
AND DOSE CALCULATIONS FOR PROJECTS PIC BLANCO AND WAGON	WHEEL* #DIFFUSION	083078 P 57
#INTAKE OF TRITIUM	WHEN SKIN IS SPLASHED WITH TRITIATED WATER*	042771 P 18
RADIOLOGY* #THE	WORK OF INTERNATIONAL ORGANIZATIONS IN THE FIELD OF	065198 P 47
#RADIATION HAZARD TO	WORKERS USING TRITIATED LUMINOUS COMPOUNDS (T0257)*	064730 P 36
#THE RADIATION HAZARD TO	WORKERS USING TRITIATED LUMINOUS COMPOUNDS*	007461 P 4
#RADIATION DOSES RECEIVED BY	WORKERS USING TRITIUM IN INDUSTRY*	048519 P 23
#ASSESSMENT OF TRITIUM IN PRODUCTION	WORKERS*	049702 P 26
LUMINOUS COMPOUND AND NEED FOR BIOLOGICAL MONITORING OF	WORKERS* #USE OF RADIOACTIVE	064784 P 45
LUMINOUS COMPOUND AND THE NEED FOR BIOLOGICAL MONITORING OR	WORKERS* #THE USAGE OF RADIOACTIVE	020666 P 10
@ESTIMATES OF DOSE EQUIVALENTS FROM FIVE INDIVIDUALS	WORKING WITH VARIOUS TRITIUM COMPOUNDS*	082354 P 56
#TRITIUM ACTIVITY IN URINE FROM LUMINOUS DIAL	WRIST WATCHES*	071195 P 51
GASES, WITH EXAMPLES OF ABSORBED DOSES FROM H-3, KR-85 AND	XE-133*RADIATION DOSE IN CLINICAL USE OF RADIOACTIVE INERT	049585 P 24
@	Y-12 RADIATION SAFETY MANUAL*	007363 P 2
OXIDE DOSIMETER--INFLUENCE OF CELL DIAMETER ON THE NITROGEN	YIELD* #THE NITROUS	007390 P 2
I. COMPARISON OF ESTIMATED AND MEASURED VALUES FOR	ZINC-65 AND TRITIUM.* FROM INTERSPECIES CORRELATIONS.	051573 P 29
CORRELATIONS. I. COMPARISON OF ESTC AND MEASURED VALUES FOR	ZN-65 AND TRITIUM (T1643)* WATER (MPCIW FROM INTERSPECIES	064773 P 42

VIII Waste Management

VIII - WASTE MANAGEMENT

004276
JACKSON RF
EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
15 PAGES, 4 FIGURES, 1 TABLE, 7 REFERENCES- MAY 1964, A/CONF. 28/P.123- PRESENTED AT THIRD U. N. INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, AUGUST 31-SEPTEMBER 9, 1964- IAEA

THE PRINCIPAL FEATURES OF THE THREE SIMILAR U.K. HEAVY WATER HIGH FLUX RESEARCH REACTOR, DIDO AND PLUTO AT HARWELL AND THE DOUNREAY MATERIALS TESTING REACTOR ARE BRIEFLY RECALLED. BRIEF MENTION IS MADE OF THE HEALTH PHYSICS ARRANGEMENT TO DETECT AND CONTROL LEAKAGE OF RADIOACTIVE SPECIES FROM EITHER THE REACTOR OR EXPERIMENTS INTO THE ENVIRONMENT. EXPERIENCE OF TRITIUM IS PARTICULARLY DISCUSSED.

MONITOR, GENERAL PRACTICE + *REACTOR, RESEARCH + *UNITED KINGDOM + OPERATING EXPERIENCE SUMMARY

004955
HANEY WA
FISSION-PRODUCT TRITIUM IN FUEL-PROCESSING WASTE
HANFORD LABORATORIES
5 PAGES, 1 FIGURE, 1 TABLE- NUCLEAR SAFETY, 5(4)- 399-403 (SUMMER 1964)- GPO

TRITIUM IS A PRODUCT OF URANIUM FISSION AND IS PRESENT IN PROCESS SOLUTIONS. THE INABILITY TO DECONTAMINATE WASTE OF TRITIUM REQUIRES THAT SAFETY OF DISPOSAL BE DEPENDENT ON FAVORABLE ENVIRONMENTAL CONDITIONS. AT HANFORD 47 TO 64 % OF THE TRITIUM IS DISCHARGED TO CRIBS AND PONDS- MOST OF THAT REMAINING IS RELEASED TO THE ATMOSPHERE OR STORED IN HIGH-LEVEL LIQUID WASTE. AT SAVANNAH RIVER ABOUT 25 % OF THE TRITIUM IS NOT CONVERTED TO TRITIATED WATER AND IS DISCHARGED FROM A 195 FT STACK. AT HANFORD ONLY ABOUT 1 % OF THE TRITIUM WAS RELEASED TO THE ATMOSPHERE AND 75 % OF THIS WAS THE OXIDE. ENVIRONMENTAL MONITORING OF TRITIUM SERVES TWO PURPOSES- IT PROVIDES A BASE FOR EVALUATION OF TRITIUM HAZARDS AND ASSISTS IN DESCRIBING THE MOVEMENT OF GROUND WATER, WHICH IS USEFUL IN ASSESSING THE HAZARDS OF OTHER LONG-LIVED RADIONUCLIDES THAT MIGHT BE RELEASED TO THE GROUND.

EFFLUENT + GROUND WATER + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *WASTE DISPOSAL, ATMOSPHERIC + WASTE DISPOSAL, TERRESTRIAL + WATER

004978
BLOMEKE JO
MANAGEMENT OF FISSION PRODUCT TRITIUM IN FUEL PROCESSING WASTES
OAK RIDGE NATIONAL LABORATORY
13 PAGES- MAY 4, 1964, ORNL-TM-851- OTS

TRITIUM, A FISSION PRODUCT OF VERY LOW YIELD, MAY MERIT SPECIAL CONSIDERATION FROM THE STANDPOINT OF ITS MANAGEMENT IN WASTES FROM FUEL PROCESSING. IN THE CASE OF PRESENT SOLVENT EXTRACTION PLANTS, AT LEAST 75% OF THE TRITIUM IN THE IRRADIATED FUEL IS DISCHARGED TO THE ENVIRONMENT IN LOW-LEVEL AQUEOUS WASTES. FUTURE PLANTS SITUATED LESS REMOTELY MAY BE RESTRICTED IN THE QUANTITY THEY CAN RELEASE TO THEIR IMMEDIATE ENVIRONS. IT WAS ESTIMATED THAT, UNDER PRESENT REGULATIONS, RELATIVELY LITTLE TRITIUM COULD BE RELEASED TO SURFACE STREAMS, BUT PLANTS PROCESSING FUEL AT RATES EQUIVALENT TO AS MUCH AS 100,000 THERMAL MEGAWATTS OF REACTOR POWER MIGHT DISPERSE THE TRITIUM SAFELY TO THE ATMOSPHERE. LARGER PLANTS MUST CONSIDER CONTAINMENT OF THE TRITIUM BY INTERNAL RECYCLE OF AQUEOUS STREAMS.

DEPOSITION + *EFFLUENT + *GEOLOGY + GROUND WATER + HAZARD, RELATIVE + RIVER + SITING, WASTE DISPOSAL + *WASTE DISPOSAL, ATMOSPHERIC + WASTE DISPOSAL, TERRESTRIAL + *SURFACE WATER, NUCLIDE OCCURRENCE + *WASTE DISPOSAL, RIVER

005341
MERRITT WF + PARSONS PJ
THE SAFE BURIAL OF HIGH-LEVEL FISSION PRODUCT SOLUTIONS INCORPORATED INTO GLASS
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER
10 PAGES, 5 FIGURES, 2 TABLES, 8 REFERENCES- HEALTH PHYSICS, 10(9)- 655-664 (1964)

HIGH-LEVEL WASTE-FISSION-PRODUCT SOLUTION CONTAINING 1000 C WAS INCORPORATED INTO GLASS BLOCKS AND THE BLOCKS BURIED FOR 3 YEARS IN SAND BENEATH THE WATER-TABLE. THE EXPERIMENT HAS SHOWN THAT, EVEN IN SATURATED SOIL WITH LOW EXCHANGE CAPACITY, THE METHOD OF DISPOSAL WAS SAFE AND THE ESCAPE OF HAZARDOUS RADIONUCLIDES WAS WITHIN ACCEPTABLY LOW LIMITS.

CERIUM + *CESIUM + GEOLOGY + RUTHENIUM + SITING, WASTE DISPOSAL + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *STRONTIUM + *WASTE DISPOSAL, TERRESTRIAL + *GROUND WATER, NUCLIDE OCCURRENCE + *GROUND WATER, PROPERTY + *GROUND WATER, TRACER

005350
BLANCO RE + PARKER FL
WASTE TREATMENT AND DISPOSAL QUARTERLY PROGRESS REPORT NOVEMBER 1963-JANUARY 1964
OAK RIDGE NATIONAL LABORATORY
133 PAGES, 24 TABLES, 33 FIGURES, 42 REFERENCES- AUGUST 1964, ORNL-TM-830- OTS

THIS REPORT IS THE THIRTEENTH OF A SERIES OF REPORTS ON PROGRESS IN THE ORNL DEVELOPMENT PROGRAM, THE OBJECTIVE OF WHICH IS TO DEVELOP AND DEMONSTRATE ON A PILOT PLANT SCALE INTEGRATED PROCESSES

005250 *CONTINUED*
FOR TREATMENT AND ULTIMATE DISPOSAL OF RADIOACTIVE WASTES RESULTING FROM REACTOR OPERATIONS AND REACTOR FUEL PROCESSING. EMPHASIS IS ON HIGH- AND LOW-ACTIVITY LIQUID WASTES. LOW-ACTIVITY WASTES WOULD BE TREATED BY SCAVENGING AND ION EXCHANGE PROCESSES OR FOAM SEPARATION. THE WASTE SOLIDS OR SLURRIES WOULD BE COMBINED WITH THE HIGH-ACTIVITY WASTES OR BE DISCHARGED TO THE ENVIRONMENT IN DEEP GEOLOGIC FORMATIONS. THE HIGH-ACTIVITY WASTES WOULD BE STORED AT THEIR SITES OF ORIGIN FOR ECONOMIC PERIODS TO ALLOW FOR RADIOACTIVE DECAY AND ARTIFICIAL COOLING. METHODS FOR THE PERMANENT DISPOSAL OF HIGH-ACTIVITY WASTES INCLUDE CONVERSION OF THE WASTE LIQUIDS TO SOLIDS BY POT CALCINATION AND FORMATION OF A GLASS OR CERAMIC. THE SOLIDS WOULD BE STORED IN A SALT MINE. ANOTHER APPROACH IS THE DISPOSAL OF THE LIQUID DIRECTLY INTO SEALED OR VENTED SALT CAVITIES. TANK STORAGE OR HIGH-TEMPERATURE CALCINATION OF INTERMEDIATE-ACTIVITY WASTES MAY BE UNATTRACTIVE BECAUSE OF THEIR LARGE VOLUMES. DIRECT DISPOSAL INTO IMPERMEABLE SHALE BY HYDROFRACTURING, IS UNDER INVESTIGATION. ENVIRONMENTAL RESEARCH ON THE CLINCH RIVER, MOTIVATED BY THE NEED FOR SAFE AND REALISTIC PERMISSIBLE LIMITS OF WASTE RELEASES, IS INCLUDED IN THIS PROGRAM.

DEPOSITION + EFFLUENT + *GEOLOGY + GROUND WATER + *RIVER + SOIL, RADIONUCLIDE MOVEMENT THROUGH + STRONTIUM + SURFACE WATER + *WASTE DISPOSAL, TERRESTRIAL + *WASTE TREATMENT, FIXATION + *WASTE TREATMENT, LIQUID + WASTE DISPOSAL, RIVER + WASTE SOURCE AND TYPE + SEDIMENT

005430
COOK JE
EVALUATION FOR EMERGENCY PLANNING OF HAZARDS FROM ACCIDENTS INVOLVING STOCKS OF RADIOACTIVE MATERIALS
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL
10 PAGES, 7 TABLES, 2 FIGURES, 13 REFERENCES- HEALTH PHYSICS, 10(11)- 823-832 (NOVEMBER 1964)

IN FORMULATING PLANS TO DEAL WITH POSSIBLE ACCIDENTS AT A NUCLEAR RESEARCH ESTABLISHMENT RELATIONSHIPS ARE NEEDED BETWEEN THE QUANTITIES OF RADIOACTIVE MATERIALS HELD IN BUILDINGS AND HAZARDS WHICH MIGHT DEVELOP DOWNWIND IF THE MATERIALS WERE INVOLVED IN FIRES, EXPLOSIONS OR SIMILAR INCIDENTS. THIS PAPER CONSIDERS THESE RELATIONSHIPS. COMPARISONS BETWEEN SITE HAZARDOUS STOCKS AND ACTUAL STOCKS HELD ENABLE THE BUILDINGS ON A SITE TO BE CLASSIFIED IN ORDER OF POTENTIAL HAZARD. CONSIDERATION IS ALSO GIVEN TO THE CONTAMINATION OF MILK AND CROPS IN THE CASE OF ACCIDENTS INVOLVING STRONTIUM-89, STRONTIUM-90, IODINE-131 AND CESIUM-137.

INCIDENT, EXPOSURE + BARIUM + CERIUM + CESIUM + IODINE + PLUTONIUM + SODIUM + STRONTIUM + TELLURIUM + URANIUM + NEPTUNIUM + POLONIUM + *DOSE CALCULATION, INTERNAL + RADIUM + *HAZARDS ANALYSIS + AMERICIUM + DOSE CALCULATION, EXTERNAL

006781
FINEMAN P
WASTE DISPOSAL
ARGONNE NATIONAL LABORATORY
12 PAGES, 7 FIGURES, 4 TABLES, 25 REFERENCES- REACTOR FUEL PROCESSING 8(1), PART IV, PP. 37-48 (WINTER 1964-1965)

REVIEWS OF RECENT PAPERS AND PROGRESS REPORTS IN WASTE DISPOSAL RESEARCH AND DEVELOPMENT ARE PRESENTED. TOPIC COVERED INCLUDES MANAGEMENT OF TRITIUM, ION EXCHANGE, CONVERSION TO SOLIDS, AND RECOVERY OF STRONTIUM.

RUTHENIUM + STRONTIUM + *CALCINATION + *WASTE TREATMENT, FIXATION + *FISSION PRODUCT, SEPARATION FROM WASTE + *GLASS + *ION EXCHANGE + MINERAL EXCHANGE

008330
MORRIS DA + TEASDALE WE
HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963

U. S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY, IDAHO FALLS, IDAHO
IDO-22046 +. 228 PAGES, FIGURES, TABLES, REFERENCES- MAY 1964- CFSTI, $6.00 CY

U. S. GEOLOGICAL SURVEY INVESTIGATIONS FOR 1963 AT THE NRTS ARE DISCUSSED AND INCLUDE REGIONAL GEOHYDROLOGY OF NRTS AND ADJACENT AREAS, SPECIAL STUDIES RELATED TO WASTE DISPOSAL, HYDROLOGY OF WASTE DISPOSAL, COLLECTION OF BASIC RECORDS AND THE FUTURE SCOPE OF THE PROGRAM.

CESIUM + GEOLOGY + GROUND WATER + *NRTS + SITING + STRONTIUM + *WASTE DISPOSAL + GROUND WATER, NUCLIDE OCCURRENCE + GROUND WATER, PROPERTY + SOIL, NUCLIDE OCCURRENCE + HYDROLOGY + GEOLOGY, GEOCHEMICAL + GEOLOGY, GEOPHYSICAL

008708
KONIG LA + ZEHME S
THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. II
ATOMPRAXIS 11 (5)- 268 +. 8 PAGES, FIGURES, TABLES, REFERENCES- MAY 1965

THE ARTICLE PRESENTS A METHOD OF CALCULATING THE LIMITS OF THE PERMISSIBLE AMOUNT OF ACTIVITY DISCHARGED FROM A NUCLEAR PLANT. A DISTINCTION IS MADE BETWEEN CONTINUOUS AND SHORT-TERM DISCHARGE. FOR PARTICULARLY IMPORTANT RADIONUCLIDES, THE LIMITS WERE CALCULATED ON THE BASIS OF THE RECOMMENDATIONS OF THE (GERMAN) FIRST RADIATION- PROTECTION ORDINANCE (1. SSVO) AND OF THE ICRP RESPECTIVELY.

BARIUM + CARBON + CESIUM + DOSE + IODINE + KRYPTON + *MPC + PLUTONIUM + STRONTIUM + XENON + ARGON + STACK + AIR + GERMANY

009022
KARP H
TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966
TRACERLAB
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12(12)- 31 (MARCH 21, 1966)

VARIOUS TRITIUM CONTAMINATED OBJECTS WERE DOUBLE BAGGED, AND PLACED IN WASTE DRUMS TO BE CEMENTED IN. EITHER DURING THE CEMENT POURING OR PUSHING DOWN A FLOATING OBJECT, TRITIUM MUST HAVE BEEN RELEASED.

*WASTE DISPOSAL + *PERSONNEL EXPOSURE, RADIATION

010702
GOODE JH
HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TENNESSEE
ORNL-3956 +. 19 PAGES, 3 FIGURES, 4 TABLES, 11 REFERENCES, JUNE 1966, CFSTI, $2.00 CY, $0.50 MN

HOT-CELL EXPERIMENTS WITH PROTOTYPE THO2-UO2 POWER REACTOR FUEL SPECIMENS IRRADIATED TO 24,600 MWD/METRIC TON (TH + U) SHOWED THAT UP TO 0.2 PERCENT OF THE FISSION-PRODUCED TRITIUM AND 1 PERCENT OF THE KR-85 WERE RELEASED WHEN THE FUEL WAS SHEARED INTO SHORT LENGTHS. IN OUR APPARATUS, ANOTHER 0.2 PERCENT OF THE TRITIUM AND THE BALANCE OF THE KRYPTON WERE RELEASED TO THE ATMOSPHERE WHEN THE FUEL WAS DISSOLVED TO MAKE SOLVENT EXTRACTION FEED. THIS QUANTITY OF TRITIUM IS LESS THAN 0.5 PERCENT OF THE ESTIMATED 1200 CURIES OF H-3 THAT MAY BE SAFELY DISCHARGED TO THE ATMOSPHERE FROM A 6-TON-PER-DAY PROCESSING PLANT.

*FISSION GAS RELEASE + KRYPTON + THORIUM + ATMOSPHERIC POLLUTION + *WASTE DISPOSAL, ATMOSPHERIC + URANIUM DIOXIDE + *RADIOCHEMICAL PLANT SAFETY + *FUEL REPROCESSING

012211
MEHAHN RO
TECHNICAL SPECIFICATIONS CHANGE 7, REVISIONS TO PROVIDE SPECIFIC LIMITS ON TRITIUM WASTE DISPOSAL
FIRST ATOMIC SHIP TRANSPORT INC., NEW YORK
6 PAGES, OCTOBER 31, 1966, DOCKET NO. 50-238, PDR

PREVIOUSLY, TRITIUM WAS NOT MENTIONED. NO TRITIUM-ANALYSIS EQUIPMENT IS CARRIED ON SHIP, SO CONCENTRATION CHANGES WILL BE ESTIMATED AS 1.2 TIMES 10(-5TH) MICROCURIE PER MILLILITER PER MEGAWATT-HOUR OF OPERATION, BASED ON A PRODUCTION RATE OF 0.019 CURIE PER MW-DAY. DISCHARGE LIMIT OF 100 CURIES OF TRITIUM PER MONTH SET. AT SEA, DISCHARGING THE MONTHLY LIMIT TO THE VOLUME DISPLACED IN THE SHIPS PASSAGE, WITH NO FURTHER DILUTION, WOULD GIVE A FACTOR OF 30 BELOW THE MPC FOR DRINKING WATER.

REACTOR, MARITIME + NS SAVANNAH (PWR) + REACTOR, PWR + WASTE DISPOSAL, OCEAN + *TECHNICAL SPECIFICATIONS

014861
N S SAVANNAH CHANGE 5 - MISC. ADMINISTRATION AND TESTING
DIVISION OF REACTOR LICENSING, UNITED STATES ATOMIC ENERGY COMMISSION
9 PAGES, FEBRUARY 5, 1967, DOCKET NO. 50-238

CHANGES ALLOWED ARE - (1) CHANGE IN ORGANIZATIONAL TITLES, (2) PROVIDE FOR TRITIUM MONITORING IN WASTE DISPOSAL, (3) LESS FREQUENT EVACUATION DRILLS, (4) CLARIFY REPORTING RESPONSIBILITY OF STAFF HEALTH PHYSICIST, (5) ALTER CHANNEL 10 AND 11 REQUIREMENTS OF RADIATION MONITORING DURING FILTER TESTS, AND (6) ALLOW PORT ENTRY IF A DOP TEST WITHIN 1 WEEK PAST SHOWED A FILTER FACTOR OF 1000 OR MORE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

ADMINISTRATIVE CONTROL + REACTOR, MARITIME + NS SAVANNAH (PWR) + REACTOR, PWR + WASTE DISPOSAL + TEST, DOP FILTER + CONTAINMENT FILTERING SYSTEM + *TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + RADIATION MONITORS

014871
HANEY WA
FISSION PRODUCT TRITIUM IN FUEL REPROCESSING WASTES
HANFORD ATOMIC PRODUCTS OPERATION
HW-SA-3303 +. 14 PAGES, 2 FIGURES, 22 REFERENCES, DECEMBER 30, 1963

FISSION-PRODUCT TRITIUM IS DISTRIBUTED THROUGHOUT THE VARIOUS LIQUID AND GASEOUS WASTE STREAMS FROM A FUEL-REPROCESSING PLANT. REPORT GIVES THE RESULTS OF TRITIUM-DISTRIBUTION STUDIES OF LIQUID AND GAS STREAMS AT HANFORD AND ICPP.

*WASTE DISPOSAL, ATMOSPHERIC + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + IDAHO FALLS + HANFORD SITE + *FUEL REPROCESSING

015822
OSLOOND JH + SCHMALZ BL
RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION, IDAHO
IDAHO OPERATIONS OFFICE, AEC, IDAHO FALLS
IDO-12040(SUPPL.1) +. 12 PAGES, 6 FIGURES, 7 TABLES, AUGUST 1966

CONTAINS INFORMATION ABOUT THE QUANTITIES, CLASSIFICATION, AND DISPOSITION OF RADIOACTIVE WASTE ACCUMULATED DURING 1965. IT IS A SUPPLEMENT TO A PREVIOUS REPORT ISSUED IN APRIL 1965, WHICH INCLUDES INFORMATION FOR THE 10-YEAR PERIOD 1966-1964.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

CESIUM + COBALT + *NRTS + RUTHENIUM + STRONTIUM + URANIUM + *WASTE DISPOSAL + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + *WASTE DISPOSAL, SOLID

016014
POITRAS JP
TRITIUM REMOVAL FROM GASES
MOUND LABORATORY, MONSANTO RESEARCH CORPORATION, MIAMISBURG, OHIO
MLM-1389 +. 16 PAGES, 5 FIGURES, 9 TABLES, 7 REFERENCES, MARCH 20, 1967

THE TRITIUM CONCENTRATION OF A GAS MIXTURE CONSISTING PRIMARILY OF HELIUM WAS REDUCED FROM 0.01 MOLE PERCENT TO 2 X 10 TO THE MINUS 12TH MOLE PERCENT. ADSORPTION EXPERIMENTS ON ACTIVATED CHARCOAL AT 77 K AND 4.2 K WERE CONDUCTED USING VARIOUS TRAPS, AND THE RESULTS COMPARED. ADSORPTION ON CHARCOAL AT 77 K, WITH TRAPS OF LARGE SURFACE AREAS, WAS MOST EFFICIENT AND PRACTICAL. THE TRITIUM WAS THEN REMOVED FROM THE GAS (MAINLY AIR) WHICH HAD BEEN CRYOGENICALLY ADSORBED BY THE CHARCOAL. THIS WAS DONE BY USING A CATALYST, HOPCALITE, HEATED TO 725 C, TO FORM TRITIATED WATER, WHICH WAS THEN ADSORBED ON A MOLECULAR SIEVE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

ADSORPTION + *WASTE TREATMENT, GAS + CHARCOAL + *WASTE TREATMENT, EQUIPMENT

016512
QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C.
4 PAGES, NATIONAL BUREAU OF STANDARDS REACTOR. FINAL SAFETY ANALYSIS REPORT, SUPPL. A, PAGES 15-1/15-4, OCTOBER 1, 1966, DOCKET NO. 50-184

DISCUSS THE PROVISIONS FOR TRITIUM CONTROL FOR BOTH ON-SITE AND OFF-SITE PERSONNEL DURING NORMAL OPERATION OR IN THE EVENT OF AN ACCIDENT, INCLUDING A HEAT-EXCHANGER TUBE-BUNDLE FAILURE WHICH CAUSES CARRYOVER OF ALL PRIMARY WATER TO THE SECONDARY COOLING SYSTEM. IN THE EVENT IT IS NECESSARY TO ISOLATE THE MAIN HEAT EXCHANGER TO EFFECT TRITIUM CONTROL (OR FOR OTHER REASONS), DISCUSS HOW CORE COOLING WOULD BE ACCOMPLISHED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*DECAY HEAT + REACTOR, HWR + REACTOR, RESEARCH + REPORT, SAR + *RESPONSE TO NRC QUESTION + COOLANT PURIFICATION SYSTEM + *FAILURE, TUBING + HEAT EXCHANGERS

017550
BLANCO RE + BLOMEKE JO + ROBERTS JT
SOLVING THE WASTE DISPOSAL PROBLEM
OAK RIDGE NATIONAL LAB., TENN.
5 PAGES, 2 TABLES, 18 REFERENCES, NUCLEONICS 25(2), PAGE 58 THRU 61 AND PAGE 68, (FEBRUARY 1967)

BY THE YEAR 2000, U.S. NUCLEAR POWER PLANTS WILL HAVE ACCUMULATED OVER 5000 TONS OF FISSION PRODUCTS. SOLIDIFICATION OF LIQUID WASTE FROM FUEL REPROCESSING FOLLOWED BY STORAGE IN SALT MINES REPRESENTS A SAFE AND ECONOMICAL METHOD OF DISPOSAL. COST OF SOLIDIFICATION, SHIPPING 1000 MILES, AND ULTIMATE DISPOSAL IN SALT IS ESTIMATED AT LESS THAN 1% OF THE TOTAL COST OF 3 MILLS/KW HR NUCLEAR POWER. OTHER ADVANTAGES OF THE PROPOSED METHOD INCLUDE LOW MOBILITY OF THE SOLID WASTE, LOW SURVEILLANCE REQUIREMENTS, LOW SOLUBILITY, AND SAFER HEAT REMOVAL.

WASTE DISPOSAL, ECONOMICS + *WASTE TREATMENT, FIXATION + ORNL + WASTE DISPOSAL, GAS + WASTE DISPOSAL, SOLID + WASTE TRANSPORTATION + *WASTE MANAGEMENT + WASTE TREATMENT, ECONOMICS + WASTE DISPOSAL, SALT + VOLATILITY PROCESS

019813
WASTE MANAGEMENT RESEARCH ABSTRACTS NO. 2
INTERNATIONAL ATOMIC ENERGY AGENCY
90 PAGES, 1966

ABSTRACTS FROM ELEVEN NATIONS ARE INCLUDED IN THIS COMPILATION. GENERAL AREAS INCLUDE - GASEOUS WASTES TREATMENT AND DISPOSAL, LIQUID WASTES TREATMENT, SOLID WASTES TREATMENT, STORAGE AND DISCHARGE STUDIES, AND ECONOMIC STUDIES.

019813 *CONTINUED*
AVAILABILITY - INTERNATION ATOMIC ENERGY AGENCY, VIENNA

COBALT + IAEA + *WASTE DISPOSAL + WASTE DISPOSAL, OCEAN + *WASTE TREATMENT + WASTE TREATMENT, FIXATION + WASTE TREATMENT, LIQUID + LEAD + POLONIUM + WASTE DISPOSAL, RIVER + WASTE TREATMENT, GAS + ZINC + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, SOLID + WASTE TREATMENT, SOLID + *WASTE MANAGEMENT + *RADIOISOTOPE + WASTE DISPOSAL, BEDROCK

021290
ELIASON JR
EARTH SCIENCES WASTE DISPOSAL INVESTIGATIONS, JULY--DECEMBER 1966
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-432 +. 17 PAGES, 2 FIGURES, 2 TABLES, REFERENCES, JUNE 14, 1967

EVALUATES GROUNDWATER CONTAMINATION RESULTING FROM DISPOSAL OF PLANT EFFLUENTS. THE EXTENT OF GROSS BETA AND TRITIUM CONTAMINATION IN GROUND WATER IS PRESENTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

CESIUM + *GROUND WATER + RUTHENIUM + STRONTIUM + *WASTE DISPOSAL + WASTE DISPOSAL, TERRESTRIAL + GROSS ALPHA + GROSS BETA + GROUND WATER, NUCLIDE OCCURRENCE + WASTE DISPOSAL, LIQUID + BATTELLE NORTHWEST + RHODIUM + HANFORD SITE

021930
BLANCO RE + PARKER FL
WASTE TREATMENT AND DISPOSAL SEMIANNUAL PROGRESS REPORT, JULY-DECEMBER 1966
OAK RIDGE NATIONAL LAB., TENN.
ORNL-TM-1887 +. 139 PAGES, FIGURES, TABLES, REFERENCES, NOV. 1967

TOPICS COVERED IN THIS REPORT ARE - TREATMENT OF HIGH-LEVEL RADIOACTIVE WASTE, TREATMENT OF LOW- AND INTERMEDIATE-LEVEL RADIOACTIVE WASTE, ENGINEERING, ECONOMICS, AND SAFETY EVALUATIONS IN CONNECTION WITH POWER-REACTOR WASTE MANAGEMENT, SEPARATION OF NOBLE GASES FROM AIR USING PERMSELECTIVE MEMBRANES, EARTHQUAKES AND REACTOR PLANT DESIGN, DISPOSAL IN NATURAL SALT FORMATIONS, DISPOSAL BY HYDRAULIC FRACTURING, FATE OF RADIONUCLIDES IN TERRESTRIAL ENVIRONMENT, APPLICATION OF MINERAL EXCHANGE, SAFETY EVALUATIONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

CESIUM + COBALT + GEOLOGY + KRYPTON + WASTE DISPOSAL + *WASTE DISPOSAL, TERRESTRIAL + WASTE STORAGE + *WASTE TREATMENT, FIXATION + WASTE TREATMENT, LIQUID + REACTOR, POWER + WASTE TREATMENT, SOLID + DOSE MEASUREMENT, EXTERNAL + *WASTE MANAGEMENT + MINERAL EXCHANGE + WATER TREATMENT + ENVIRONMENT + *EARTHQUAKE + *WASTE DISPOSAL, HYDRAULIC FRACTURING + *WASTE DISPOSAL, SALT + GEOLOGY, SALT STRUCTURE + *SAFETY EVALUATION + ROCK MECHANICS

022928
BLOMEKE JO + HARRINGTON FE
MANAGEMENT OF RADIOACTIVE WASTES AT NUCLEAR POWER STATIONS
OAK RIDGE NATIONAL LAB., TENN.
ORNL-4070 +. 101 PAGES, FIGURES, TABLES, 44 REFERENCES, JAN. 1968

AS A PRELIMINARY STEP IN ASSESSING WASTE-DISPOSAL OPERATIONS IN THE EXPANDING NUCLEAR POWER INDUSTRY, THE OPERATING EXPERIENCE IN WASTE MANAGEMENT AT THE DRESDEN-I, BIG ROCK POINT, HUMBOLDT BAY, ELK RIVER, INDIAN POINT-I, AND YANKEE POWER STATIONS IS REVIEWED. ALL THESE PLANTS HAVE OPERATED WITHIN AUTHORIZED LIMITS AT COSTS ESTIMATED TO RANGE BETWEEN 2 AND 10% OF ANNUAL OPERATING COSTS. GASEOUS RELEASE RATES HAVE RANGED FROM AS LOW AS 10 TO THE MINUS 5% TO 30% OF ALLOWABLE, AND LIQUID WASTES FROM 0.0002% TO 9.9%. TRITIUM RELEASES HAVE BEEN BELOW 1% OF ALLOWABLE IN ALL CASES. IT IS CONCLUDED THAT WASTE-MANAGEMENT PRACTICES HAVE BEEN ADEQUATE AND THAT NO PROBLEMS ARE ANTICIPATED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

BIG ROCK POINT (BWR) + REACTOR, BWR + DRESDEN 1 (BWR) + ELK RIVER (BWR) + HUMBOLDT BAY (BWR) + INDIAN POINT 1 (PWR) + REACTOR, PWR + WASTE DISPOSAL, ATMOSPHERIC + YANKEE ROWE (PWR) + WASTE DISPOSAL, ECONOMICS + REACTOR, POWER + WASTE DISPOSAL, RIVER + WASTE SOURCE AND TYPE + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + *WASTE DISPOSAL, SOLID + *WASTE MANAGEMENT + RADIONUCLIDE, INDUCED + OPERATING EXPERIENCE

023297
BARRACLOUGH JT + TEASDALE WE + ROBERTSON JB + JENSEN RG
HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966
GEOLOGICAL SURVEY, IDAHO FALLS, IDAHO
IDO-22049 +. 95 PAGES, FIGURES, TABLES, REFERENCES, OCTOBER 1967

THIS ANNUAL REPORT DESCRIBES STUDIES BY THE U.S. GEOLOGICAL SURVEY, SPONSORED BY THE USAEC, TO DETERMINE THE HYDROLOGIC EFFECTS OF DISPOSAL OF RADIOACTIVE WASTE TO THE GROUND AT THE NATIONAL REACTOR TESTING STATION. THE PROJECT HAS INVOLVED THE COLLECTION AND ANALYSES OF GROUND- AND SURFACE-WATER SAMPLES FOR RADIOMETRIC AND CHEMICAL CHANGES. RESULTS HAVE BEEN EVALUATED AND

023797 *CONTINUED*
MAPPED. GROUND-WATER LEVELS HAVE ALSO BEEN MAPPED OVER THE STATION. THE NET GROUND-WATER CONSUMPTION AFTER PUMPAGE WAS WASTE INJECTION HAS BEEN DETERMINED. TWO BILLION GALLONS OF WATER WERE PUMPED DURING 1966, OF WHICH 40% WAS METERED AND RETURNED TO THE SNAKE PLAIN AQUIFER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA $3.00 COPY, $0.65 MICROFICHE

CESIUM + GEOLOGY + IODINE + NIOBIUM + NRTS + STRONTIUM + WASTE DISPOSAL + WATER + ZIRCONIUM + HYDROLOGY

026177
COWSER KE
CONSEQUENCES OF ACTIVITY RELEASE - WASTE MANAGEMENT AT NUCLEAR POWER STATIONS
OAK RIDGE NATIONAL LAB., TENN.
10 PAGES, 2 FIGURES, 1 TABLE, 20 REFERENCES, NUCLEAR SAFETY, 9(3), PAGE 239-248, (JUNE 1968)

THE MANAGEMENT OF WASTES PRODUCED AT NUCLEAR POWER PLANTS MAY BECOME AN INCREASINGLY SIGNIFICANT PROBLEM IN AN ECONOMY THAT IS EXPECTED TO GROW TO 50 TIMES ITS PRESENT SIZE WITHIN THE NEXT 13 YEARS. AS A PRELIMINARY STEP IN ASSESSING FUTURE IMPLICATIONS, REVIEWS WERE MADE OF THE OPERATING EXPERIENCE IN WASTE MANAGEMENT AT ARBITRARILY SELECTED NUCLEAR POWER STATIONS. ALL HAVE OPERATED WELL WITHIN THE LIMITS AUTHORIZED FOR RELEASE OF RADIOACTIVE WASTES TO THE ENVIRONMENT. THE CONCENTRATION OF TRITIUM IN THE RECENT ANALYSES GIVE EVIDENCE THAT 5 TO 20 CURIES HAS BEEN RELEASED ANNUALLY AT EACH OF THE BOILING-WATER-REACTOR STATIONS, AND ABOUT 500 AND 1300CURIES HAVE BEEN DISCHARGED ANNUALLY AT INDIAN POINT AND YANKEE, RESPECTIVELY. IN ALL CASES, TRITIUM HAS BEEN RELEASED AT MUCH LESS THAN 1% OF ITS LIMIT. IT IS CONCLUDED THAT WASTE-MANAGEMENT PRACTICES AT LIGHT-WATER POWER-REACTOR STATIONS HAVE BEEN QUITE ADEQUATE.

*WASTE DISPOSAL, SOLID + *WASTE MANAGEMENT + *RADIATION SAFETY AND CONTROL + REACTOR POWER + RADIOACTIVITY RELEASE + ENVIRONMENT

028005
BJERGE T
RADIOACTIVE WASTE FROM ATOMIC POWER STATIONS
DANISH ATOMIC ENERGY COMMISSION, RISOE
RISO-M-735 +. 6 PAGES, 1 TABLE, APRIL 1968

THE HIGHLY RADIOACTIVE WASTE FROM ATOMIC POWER STATIONS IS AT PRESENT IN GENERAL STORED IN LIQUID FORM IN STAINLESS STEEL CONTAINERS. IT SEEMS POSSIBLE TO FURTHER CONCENTRATE THE WASTES BY SOLIDIFICATION IN THE FORM OF GLASS. EVEN WITH AN ATOMIC POWER PRODUCTIONLEVEL MUCH IN EXCESS OF THE PRESENT TOTAL POWER PRODUCTION LEVEL, THE STORAGE FOR A THOUSAND YEARS OR MORE WILL NOT CONSTITUTE A SERIOUS SPACE-CONSUMING PROBLEM. THE QUESTIONS OF KRYPTON-85 AND TRITIUM ARE ALSO TOUCHED UPON. THESE DO NO CONSTITUTE ANY SERIOUS PROBLEMS.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*KRYPTON + *WASTE STORAGE + *WASTE TREATMENT, FIXATION + REACTOR POWER + *SINTERING

028659
LOGSDON JE + ROBINSON TL
RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES (ADDENDUM 1 TO BRH/DER 70-2)
U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, WASHINGTON, D.C.
ORP/SID-71-1 +. 29 PAGES, 38 REFERENCES, OCTOBER 1971

SUMMARIZES DISCHARGES THROUGH 1968 OF LIQUID AND GASEOUS RADIOACTIVE WASTES FROM NINE NUCLEAR POWER FACILITIES. IT ALSO INCLUDES A GENERAL DISCUSSION OF THE SOURCE, TYPES AND TRENDS OF LIQUID AND GASEOUS WASTES, THE ADMINISTRATIVE CONTROLS, AND THE OPERATING EXPERIENCE FOR THE NINE NUCLEAR POWER STATIONS INCLUDED. VARIOUS TABLES AND CHARTS SUMMARIZE THE CHARACTERISTICS OF THE FACILITIES AND THEIR DISCHARGES. THIS ADDENDUM TO THE REPORT UPDATES THE TABLES AND CHARTS THROUGH 1970. IT ALSO PROVIDES DATA FOR ONE ADDITIONAL PWR AND THREE ADDITIONAL BWR PLANTS - GINNA (PWR), LA CROSSE (BWR), NINE MILE POINT (BWR), AND OYSTER CREEK (BWR).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ADMINISTRATIVE CONTROL + EFFLUENT + *REACTOR, POWER + WASTE SOURCE AND TYPE + REACTOR POWER + *RADIOACTIVITY RELEASE + FUEL REPROCESSING + *SURVEILLANCE PROGRAM + GAS + LIQUID + *DATA COLLECTION + COMPARISON + N-POWER FORECAST + *DISCHARGE

028836
MARTER WL
GROUND WASTE DISPOSAL PRACTICES AT THE SAVANNAH RIVER PLANT
SAVANNAH RIVER LABORATORY
STI/PUB + CONF-670512 +. 12 PAGES, PAGES 95-106 OF DISPOSAL OF RADIOACTIVE WASTES INTO THE GROUND, FROM JOINT IAEA/ENEA SYMPOSIUM, VIENNA, AUSTRIA

SOLID RADIOACTIVE WASTE HAS BEEN BURIED AT THE SAVANNAH RIVER PLANT SINCE 1953. THE WASTE, CONSISTING OF EQUIPMENT AND MATERIAL CONTAMINATED WITH FISSION PRODUCTS, ACTIVATION PRODUCTS, AND TRANSURANIC ISOTOPES, HAS BEEN BURIED IN UNLINED EARTHEN TRENCHES ABOVE THE WATER TABLE. A TOTAL OF 1,500,000 CI OF FISSION AND ACTIVATION PRODUCTS, AND 9000 CI OF TRANSURANIC ELEMENTS, HAVE BEEN BURIED THROUGH 1966. SEEPAGE BASINS COST ABOUT $0.25/CU. METER TO CONSTRUCT, AND EXPERIENCE

028836 *CONTINUED*
INDICATES THAT THE USEFUL LIFE OF A BASIN IS GREATER THAN 10 YEARS.

DIFFUSION + MONITOR, LIQUID + *SOIL, RADIONUCLIDE MOVEMENT THROUGH + *WASTE STORAGE + SAVANNAH RIVER PLANT + THERMAL CONSIDERATION + *WASTE DISPOSAL, SOLID + WASTE TREATMENT, SOLID + *WASTE TREATMENT, ECONOMICS + *HYDROLOGY + ION EXCHANGE + PRECIPITATION + RADIATION SAFETY AND CONTROL

029033
BLOMEKE JO + HARRINGTON FE
WASTE MANAGEMENT AT NUCLEAR POWER STATIONS
10 PAGES, NUCLEAR SAFETY, 9, PAGES 239-248 (MAY-JUNE 1968)

THE MANAGEMENT OF WASTES PRODUCED AT NUCLEAR POWER PLANTS MAY BECOME AN INCREASINGLY SIGNIFICANT PROBLEM IN AN ECONOMY EXPECTED TO GROW TO 50 TIMES ITS PRESENT SIZE WITH THE NEXT 13 YEARS. AS PRELIMINARY STEP IN ASSESSING FUTURE IMPLICATIONS, REVIEWS WERE MADE OF THE OPERATING EXPERIENCE IN WASTE MANAGEMENT AT THE ARBITRARILY SELECTED DRESDEN 1, BIG ROCK POINT, HUMBOLDT BAY, ELK RIVER, INDIAN POINT 1, AND YANKEE POWER STATIONS. WASTE-MANAGEMENT PRACTICES AT LIGHT-WATER POWER-REACTOR STATIONS HAVE BEEN QUITE ADEQUATE IN THE PAST, AND THAT THERE ARE NO FUTURE PROBLEMS ANTICIPATED IN THIS AREA THAT WILL NOT BE RESOLVED IN THE NORMAL COURSE OF AN EXPANDING INDUSTRIAL TECHNOLOGY.

*MPC + REACTOR, POWER + *WASTE MANAGEMENT + MONITOR + *RADIATION SAFETY AND CONTROL + *OPERATING EXPERIENCE

031408
MERCER RW + AMES LL + PARKHURST RG
REMOVAL OF CS-137 FROM ALKALINE CONDENSATE WASTES
BATTELLE MEMORIAL INST., PACIFIC NORTHWEST LAB., WASH.
BNWL-829 +. 35 PAGES, 17 FIGURES, 2 TABLES, 5 REFERENCES, NOVEMBER 1968

CESIUM-137 IS EFFECTIVELY REMOVED FROM ITS, SX, AND 242-T CONDENSATES BY ION EXCHANGE ON AW 500 COLUMNS. THE AW-500 COLUMNS WERE CAPABLE OF PROCESSING 5000 OR MORE COLUMN-VOLUMES TO BREAKTHROUGH OF THE CS-137. A 7M NANO3 SOLUTION WAS EFFECTIVE FOR REGENERATING THE AW-500 COLUMNS. REGENERATION WAS ACCOMPLISHED IN 10 TO 20 COLUMN-VOLUMES AT 65 TO 70 C. ALTHOUGH CS-137 MAY BE REDUCED TO DRINKING-WATER LIMITS (1/10 MPC(W) 168 HR) IT DOES NOT APPEAR LIKELY THAT ALL THE RADIONUCLIDES IN ITS CONDENSATE CAN BE ECONOMICALLY REDUCED TO THIS LEVEL. WHILE THE OTHER FISSION PRODUCTS SUCH AS RU-106 CAN BE REMOVED WITH STRONG BASE AND STRONG ACID ION EXCHANGE RESINGS, NO PRACTICAL METHOD EXISTS FOR REMOVING THE TRITIUM. A DF OF ABOUT 10 IS REQUIRED TO MEET THE DRINKING WATER LIMIT IN ITS CONDENSATE FOR BOTH RU-106 AND H-3.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*CESIUM + *WASTE TREATMENT, LIQUID + WASTE MANAGEMENT + *EVAPORATION + ION EXCHANGE + EXPERIMENT + *FUEL REPROCESSING

035171
RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION - IDAHO OPERATIONS OFFICE
AHOIDAHO OPERATIONS OFF
IDO-12040, SUPPL. 4 +. 15 PAGES, 6 FIGURES, 11 TABLES, APRIL 1, 1969

THE INFORMATION IN THIS REPORT INCLUDES DATA ON RADIOACTIVE WASTE ASSOCIATED WITH REACTOR OPERATIONS OR RESEARCH STUDIES AT THE NATIONAL REACTOR TESTING STATION DURING 1968. THE RADIOACTIVE WASTES ARE IDENTIFIED ACCORDING TO QUANTITY, PHYSICAL FORM, NUCLIDE CONTENT, AND THE INSTALLATION OR AREA ORIGINATING THE WASTE. RADIOACTIVE WASTE DATA FOR THE YEARS 1955 THROUGH 1967 ARE ALSO GIVEN IN SUMMARY FORM. A MORE DETAILED PRESENTATION OF DISPOSAL DATA FOR YEARS PRIOR TO 1968 IS AVAILABLE IN REPORTS IDO-12040 AON IDO-12040 SUPPLEMENTS NO. 1, NO. 2, AND NO. 3.

CERIUM + CESIUM + COBALT + EBR 1 AND 2 (RE) + IODINE + NRTS + RUTHENIUM + STRONTIUM + CHROMIUM + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + *WASTE DISPOSAL, SOLID + *WASTE MANAGEMENT + IDAHO FALLS + *REACTOR + *FUEL REPROCESSING

035393
LOW-TEMPERATURE ADSORPTION STUDIES FOR THE PSC REACTOR
GENERAL ATOMIC
GA-7932 +. 20 PAGES, 9 FIGURES, 3 TABLES, 5 REFERENCES, JUNE 27, 1967

LABORATORY EXPERIMENTAL WORK ON ADSORPTION AT LIQUID-NITROGEN TEMPERATURE FOR THE PSC REACTOR PROJECT IS DESCRIBED. DATA ON THE DYNAMIC AND EQUILIBRIUM ADSORPTION OF H2, TRITIUM, AND CO ON ACTIVATED CARBON AT -196 C ARE GIVEN. IN ADDITION, EXPERIMENTS ON THE EFFECT OF HIGH CO IMPURITY LEVELS ON THE ADSORPTION OF KR ARE REPORTED. THE RESULTS INDICATE THAT THE LANGMUIR ISOTHERM MODEL IS AN EXCELLENT REPRESENTATION OF PURE AND MIXED GAS ADSORPTION ON ACTIVATED CARBON.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*ADSORPTION + *CARBON + HYDROGEN + KRYPTON + CARBON MONOXIDE + *GAS

036242
BAUMGARTNER F
REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING BURN-UP OF FUTURE FUELS
GESELLSCHAFT FUR KERNFORSCHUNG, KARLSRUHE
KFK-884 +. 13 PAGES, 2 TABLES, 36 REFERENCES, DECEMBER 1968

DISCUSSES IN GENERAL TERMS CONSEQUENCES OF INCREASING BURNUP ON REPROCESSING. PROBLEMS FORESEEN INCLUDE TRANSPORT, MECHANICAL DISASSEMBLY, SOLVENT DAMAGE. THESE RESULT FROM HIGH FISSION-PRODUCT CONCENTRATIONS WITH CORRESPONDING AMOUNTS OF VOLATILE IODINE AND TRITIUM.

AVAILABILITY - AEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

*FUEL BURNUP + IODINE + RADIATION DAMAGE + GERMANY + OFF GAS + SOLVENT EXTRACTION PROCESS + *FUEL REPROCESSING

036783
KRAUSE H
TREATMENT AND FINAL STORAGE OF RADIOACTIVE RESIDUES
7 PAGES, ATOMWIRTSCHAFT-ATOMTECHNIK, 16(8/9), PP. 461-467 (AUGUST-SEPTEMBER 1971) (IN GERMAN)

PROGRESS REVIEW OF SAFETY WITH RESPECT TO OPERATIONS CONCERNING CONTAINMENT, TREATMENT, HANDLING, STORAGE, AND DISPOSAL OF RADIOACTIVE WASTES.

CESIUM + DECONTAMINATION + EFFLUENT + STRONTIUM + *WASTE HANDLING + *WASTE STORAGE + *WASTE TREATMENT + *WASTE MANAGEMENT + INCINERATION + *WASTE DISPOSAL, SALT

041523
LETTER, NFS TO DIVISION OF MATERIAL LICENSING REQUESTING CONSIDERATION OF CONSTRUCTION APPLICATION
NUCLEAR FUEL SERVICES
7 PAGES, LETTER - NFS TO DIVISION OF MATERIALS LICENSING - JANUARY 21, 1970, DOCKET 50-201

PROPOSAL IS TO DRILL A DEEP DISPOSAL WELL FOR DISPOSAL OF LOW LEVEL WASTE WHOSE RADIOACTIVITY IS 99% TRITIUM WITH AN EXPECTED SUBSTANTIAL INCREASE FROM THE PLANNED PLANT EXPANSION. ATTACHED IS SPECIFICATIONS FOR CONSTRUCTION OF THE WELL AND WELL TEST DATA OF A SIMILAR WELL RECENTLY COMPLETED IN THE WESTERN NEW YORK AREA.

AVAILABILITY - PRD

*WASTE DISPOSAL, TERRESTRIAL + *CONSTRUCTION PERMIT PROCESS + *WASTE DISPOSAL, LIQUID + *WASTE DISPOSAL, BEDROCK + *NFS + *SOLVENT EXTRACTION PROCESS + *FUEL REPROCESSING

043979
RADFORD EP
ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD
6 PAGES, ATOMIC ENERGY CLEARING HOUSE, 16(5), PG 25-30 (FEBRUARY 2, 1970)

SPEAKER DEVELOPS A SCHOLARLY PRESENTATION OF POTENTIAL EFFECTS OF TRITIUM RELEASES. HE POINTS OUT THAT MOST SERIOUS SOURCE WOULD BE FROM FUEL REPROCESSING PLANTS, ALTHOUGH RELEASES TO WATER (CHESAPEAKE BAY) CAN BE HIGHLY SIGNIFICANT. ASSUMING THE AEC ACCEPTS THE LINEAR-DOSE-RESPONSE, NONTHRESHOLD, AND MAXIMUM-PERMISSIBLE-CONCENTRATION CONCEPTS, THEN HE HAS FIGURES TO SHOW POTENTIAL POPULATION MUTAGENIC EFFECTS (SPERM AND OVA). HE DIVIDES DOSES DUE TO VARIOUS RADIATION SOURCES PERCENTAGEWISE. IN ADDITION HE STATES HIS CONSIDERED ACCEPTABLE GENETIC RISK FROM TRITIUM. FROM THESE HE DEVELOPS HIS THESIS. HENCE, MANKIND MUST BE PREPARED TO ACCEPT CERTAIN RISKS, AND THE AEC WOULD SERVE BEST IF IT AWAKENS PUBLIC TO THEIR RESPONSIBILITIES FOR TACKLING THE WHOLE RANGE OF ENVIRONMENTAL PROBLEMS. DECISIONS MADE NOW CAN INFLUENCE GENERATIONS TO COME FOR CENTURIES.

CRUSTACEAN + CESIUM + CODES AND STANDARDS + CONGRESSIONAL ACTIVITY + ERC + KRYPTON + STRONTIUM + *REACTOR, POWER + ICRP + NCRP + RADIOACTIVITY RELEASE + WATER POLLUTION + FUEL REPROCESSING + CALVERT CLIFFS 1 (PWR) + DATA COLLECTION + FOOD CHAIN + AQUATIC ORGANISM + EFFECT, GENETIC + (TAMPLIN A) + INDUSTRY, NUCLEAR + BIOLOGICAL CONTROL + OPPONENT + *SOCIO/PHILOSOPHICAL CONSIDERATION

044068
IN THE UTILITIES
1 PAGE, NUCLEONICS WEEK, PG 4 (OCTOBER 9, 1969)

COOK COUNTY SANITARY DISTRICT MAY FILE SUIT AGAINST ELECTRIC MICHIGAN NUCLEAR POWER STATION. ITS UNALTERABLE POSITION IS THAT NO WASTE GO INTO LAKE MICHIGAN AND NO CHANGE WHATSOEVER IN THE TEMPERATURE. IT OBJECTS TO THERMAL AND TRITIUM INJECTION PLUS THREAT OF RADIOACTIVE LEAKAGE. IT SEES PLANT DISCHARGES AS A THREAT TO CHICAGO WATER SUPPLY. (SEVERAL BIG STEEL PLANTS PRESENTLY BEING SUED.)

*REACTOR, POWER + WATER POLLUTION + THERMAL POLLUTION + COOK 1 (PWR) + ZION 1 (PWR) + *AGENCY, MUNICIPAL + *LITIGATION + OPPONENT + SPOKESMAN, STATE

044106
TRITIUM RELEASE AT CALVERT CLIFFS
BALTIMORE GAS AND ELECTRIC COMPANY
1 PAGE, PUBLIC INFORMATION BROCHURE, 1969

A PUBLIC-INFORMATION BROCHURE CONCERNING TRITIUM RELEASE AT CALVERT CLIFFS. THEY ARE BUILDING A $4.4 MILLION PROCESSING SYSTEM THAT WILL HAVE REMOVAL EFFICIENCY OF 99.9999 PERCENT FOR MOST IMPURITIES, 97 PERCENT EFFICIENCY FOR REMAINING RADIOACTIVE IMPURITIES, EXCEPT TRITIUM. FOOD-CHAIN BUILDUP ACKNOWLEDGED BUT EXAMPLES GIVEN OF INSIGNIFICANCE AND NUMERICAL VALUES ARE ILLUSTRATIVE.

*ECOLOGY + REACTOR, POWER + *RADIATION, PUBLIC EDUCATION + RADIOACTIVITY RELEASE + WATER POLLUTION + *CALVERT CLIFFS 1 (PWR) + ENVIRONMENTAL CONTROL MEASURE + FOOD CHAIN + N-POWER, SAFETY OF + PROPONENT + SPOKESMAN, UTILITY

044650
METHOD FOR REDUCTION OF TRITIUM VAPOR CONCENTRATION
U.S. ATOMIC ENERGY COMMISSION
ROE-70-5 +. 2 PAGES, MAY 12, 1970

THROUGH LEAKAGE IN COMPONENTS OF THE PRIMARY SYSTEM (VALVE STEMS, ETC.), TRITIUM VAPOR IS INTRODUCED INTO THE ATMOSPHERE OF THE CONTAINMENT BUILDING. BY ADDING CLEAN, LOW-PRESSURE STEAM (200 LB/HR) INTO THE CIRCULATING AIR STREAM, SATURATING IT, MOISTURE AND TRITIUM WERE THEN REMOVED BY CONDENSATION ON COOLING COILS. TRITIUM CONCENTRATION WAS REDUCED BY A FACTOR OF 5. INJECTION STARTED 24 HR BEFORE A PLANNED ENTRY INTO CONTAINMENT.

AVAILABILITY - DUDLEY THOMPSON, USAEC, DIVISION OF REACTOR LICENSING, WASHINGTON, D.C. 20545

*AIR CLEANING + CONTAINMENT + REACTOR, PWR + PROCEDURES AND MANUALS + *STEAM + *CONDENSATION + CONTAMINATION + *REDUCTION + OPERATING EXPERIENCE

044674
JUNKINS RL
BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
CONF-690303 +. 11 PAGES, PP. 133-43 OF THE PROCEEDINGS OF A SYMPOSIUM ON BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE, LIVERMORE, CALIFORNIA, MARCH 5-7, 1969

THE RELEASES OF RADIONUCLIDES FROM REACTORS AND THE ENVIRONMENTAL EFFECTS OF THESE RELEASES HAVE BEEN STUDIED SINCE THE EARLY 1940S. CONTROLS BASED ON THE KNOWLEDGE GAINED FROM THESE STUDIES HAVE BEEN ADEQUATE TO MAINTAIN THE RADIATION EXPOSURE OF THE PUBLIC WELL WITHIN ACCEPTABLE LIMITS. THE SIGNIFICANT PATHWAYS OF EXPOSURE HAVE BEEN IDENTIFIED. OVER THE YEARS IMPROVED METHODS OF WASTE TREATMENT AND CONTAINMENT TECHNOLOGY FOR REACTORS HAVE EVOLVED TO THE POINT WHERE RELEASE OF WASTE HEAT FROM POWER REACTORS NOW APPEAR TO BE RECEIVING MORE PUBLIC ATTENTION THAN THE RELEASE OF RADIONUCLIDES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIOMEDICAL + ECOLOGY + FALLOUT + WASTE TREATMENT + CONTAINMENT R AND D + SAVANNAH RIVER PLANT + CHALK RIVER + RADIOISOTOPE + ENVIRONMENT + HANFORD SITE + *REACTOR, PRODUCTION + *RADIONUCLIDE TRANSFER

044916
REDUCTION OF TRITIUM CONCENTRATION RELEASED TO UNRESTRICTED AREAS
THEORDORE R. SCHWALM, INC.
2 PAGES, LETTER - THEORDORE 4. SCHWALM, INC. TO DIVISION OF COMPLIANCE (AEC) - MARCH 19, 1970

1969 AVERAGE CONCENTRATION RELEASED TO UNRESTRICTED AREAS WAS 0.81 X 10(-6TH) MICROCURIE/CC WHICH IS 4 TIMES MPC (AIR). RUNNING STACK FAN CONTINUOUSLY NOW TO GET AN ADDITIONAL DILUTION FACTOR OF 4.2. VARIOUS MEASUREMENTS ARE BEING MADE TO STUDY THE DIFFUSION OF TRITIUM AFTER IT LEAVES THE STACK. A MODIFICATION TO THE STACK IS PROPOSED TO INCREASE DILUTION FACTOR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + CONCENTRATION, MAXIMUM + DIFFUSION + BYPRODUCT MATERIAL + *VENTILATION SYSTEM + STACK + AIR + WASTE DISPOSAL, GAS + EQUIPMENT DESIGN + *OPERATING EXPERIENCE + *OFF SITE

044972
MCBRIDE JA
IRRADIATED FUEL REPROCESSING AND THE ENVIRONMENT
AEC, DIVISION OF MATERIALS LICENSING
22 PAGES, 9 FIGURES, 10 REFERENCES, PAPER PRESENTED AT THE PUBLIC AFFAIRS WORKSHOP ON RADIATION AND MANS ENVIRONMENT, BUCK HILL FALLS, PA., APRIL 19-22, 1970

DISCUSSES THE SIGNIFICANCE OF FUEL REPROCESSING, THE VARIOUS ASPECTS OF RADIATION SAFETY AND CONTROL, TRANSPORTATION AND HANDLING OF RADIOACTIVE MATERIALS, AND THE REGULATIONS AND LICENSING OF OPERATORS.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM, 850 THIRD AVENUE, NEW YORK, NEW YORK 10022

044972
CODES AND STANDARDS + KRYPTON + REGULATION + SITING, CHEMICAL PROCESS PLANT + *TRANSPORTATION AND HANDLING + WASTE STORAGE + *CONTAINMENT INTEGRITY + ACCIDENT, HYPOTHETICAL + MONITOR, ENVIRONMENTAL + WASTE DISPOSAL, SOLID + *RADIATION SAFETY AND CONTROL + *NFS + OPERATING LICENSE PROCESS + *FUEL REPROCESSING

045009
WESTINGHOUSE OFFERS SYSTEMS FOR ESSENTIALLY ZERO RELEASE OF RADWASTE
1 PAGE, NUCLEAR INDUSTRY, P. 40 (MAY 1970)

THE COMPANY HAS ANNOUNCED THAT IT IS OFFERING A NEW RADWASTE SYSTEM THAT WOULD ADD ABOUT $1/KW TO THE COST OF A NEW PLANT. THE SYSTEM WILL ENABLE KRYPTON AND TRITIUM TO BE RETAINED FOR LONG TIMES AND EITHER STORED ON-SITE OR SHIPPED OFF PERIODICALLY. THE QUANTITY INVOLVED YEARLY IS ENOUGH TO BE CONTAINED IN 5 NORMAL-SIZED OXYGEN TANKS SUCH AS USED BY WELDERS. DISCHARGE OF NUCLIDE GASES WOULD OCCUR ONLY WHEN THE CONTAINMENT STRUCTURE IS VENTILATED ONCE A YEAR DURING REFUELING, AND THESE WOULD BE BARELY DETECTABLE ABOVE NATURAL BACKGROUND. RELEASE OF TRITIUM WOULD BE COMPLETELY ELIMINATED DURING NORMAL OPERATIONS (REMOVED AS TRITIUM OXIDE), AND OFF-SITE DISPOSAL REQUIRED 1/2 TIMES DURING PLANTS LIFETIME. SYSTEM WILL BE INSTALLED IN THE 2 ZION UNITS.

FISSION PRODUCT RELEASE + KRYPTON + ATMOSPHERIC POLLUTION + REACTOR, POWER + RADIOACTIVITY RELEASE + ENVIRONMENT + *FISSION PRODUCT RETENTION + ZION 1 (PWR) + *EQUIPMENT DEVELOPMENT + *INDUSTRY, NUCLEAR

045016
MCBRIDE DISCUSSES FUEL REPROCESSING
ATOMIC INDUSTRIAL FORUM, INC.
1 PAGE, INFO ISSUE NO. 27 (SUPPLEMENT), P. 5 (MAY 1970)

THE DIR. OF AEC DIV. OF MATERIALS LICENSING DISCUSSES THE CONCERN TO ENVIRONMENTALISTS OF INCREASING NUMBER OF REPROCESSING PLANTS, BECAUSE THESE REPRESENT ONLY OPERATION IN NUCLEAR-INDUSTRY CYCLE WHERE FISSION PRODUCTS ARE MOBILE. KRYPTON AND TRITIUM MERIT MOST ATTENTION. LOCAL EXPOSURE FROM HIGH-CAPACITY PLANTS MAY DICTATE A REQUIREMENT TO SEPARATE THEM FROM PLANT EFFLUENT (E.G., NFS PLANT, W. VALLEY, N.Y.). AEC FEELS IT IS PRACTICAL TO ACHIEVE A REDUCTION IN PRESENT EFFLUENT LEVELS. HE COVERS SR-90 BUILDUP IN A PERSON EATING FISH, AND CS-137 FROM EATING DEER (BOTH FROM ENVIRONS OF PLANT). THE ROCHESTER COMMITTEE FOR SCIENTIFIC INFORMATION REPORTED EXCESSIVE STRONTIUM RELEASED IN NFS EFFLUENT. BASED ON NFS AND N.Y. DEPT. OF HEALTH DATA, AEC INVESTIGATED AND FOUND WITHIN LIMITS. HE DESCRIBED PLANNED REPROCESSING PLANTS BY GE AND ALLIED CHEMICAL AND THEIR PLANS FOR EFFLUENT CONTROL

CODES AND STANDARDS + FRC + FISSION PRODUCT RELEASE + KRYPTON + *RADIOACTIVITY RELEASE + NFS + *FUEL REPROCESSING + RADIONUCLIDE UPTAKE + ANIMAL, FISH + CONCENTRATION + MAMMAL + MAN + INDUSTRY, NUCLEAR + ORGANIZATION, CITIZEN + SPOKESMAN, AEC

046465
SELECTED ITEMS OF INTEREST
CENTRE D/ETUDES NUCLEAIRES, FONTENAY-AUX-ROSES (FRANCE)
ANL-TRANS-79 +. 15 PAGES, TRANSLATION OF CEA-N-1148, NOVEMBER 1968

THIS TRANSLATION IS CONCERNED WITH CONCENTRATION OF EFFLUENTS. TOPICS ARE - CONCENTRATION OF EFFLUENTS BY ION EXCHANGE, RESEARCH WITH EXCHANGERS, USE OF ORGANIC RESINS AND INORGANIC EXCHANGERS FOR TREATMENT OF EFFLUENTS FROM CEN/S, CEN/CA, UP-2, STUDY OF PULSED-EVAPORATION TECHNIQUES, PILOT PLANT OF TRITRATED EFFLUENTS (4 LITERS/HR AND CELL FOR 50 LITERS/HR).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

COBALT + REPORT, OPERATIONS + CHEMICAL KINETICS + ION EXCHANGE + TEST, BENCH + RESEARCH CONTRACT

047086
VAN WAVEREN NJ
HOLD-UP TIME OF THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF-GAS SYSTEM DELAY SECTION
TECHNISCHE HOGESCHOOL, DELFT (NETHERLANDS)
AEC-TR-7092 +. 25 PAGES, TRANSLATION OF A GERMAN REPORT, DECEMBER 2, 1966

TO PREVENT CONTAMINATION OF THE ENVIRONMENT, ANY RADIOACTIVE GASES FORMED ARE PASSED THROUGH A DELAY SECTION IN WHICH THE RADIOACTIVE ISOTOPES DECAY. A CERTAIN MINIMUM DELAY TIME IS NECESSARY IN ORDER TO INSURE A VALID CALCULATION OF THE RADIOACTIVITY DISPERSION IN THE ENVIRONMENT. THE DELAY SECTION USED FOR THE MEASUREMENTS WAS SHORTER THAN THAT PLANNED AND REQUIRED FOR THE EXPERIMENT. A CALCULATION PERFORMED USING A LAMINAR FLOW AS THE STARTING POINT GIVES A DELAY TIME WHICH IS IN AGREEMENT WITH THE RESULTS OBTAINED. INASMUCH AS THE FLOW CONDITIONS ARE KNOWN, THE RESULTS CAN BE EXPLAINED FAIRLY READILY.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

HYDROGEN + KRYPTON + OXYGEN + XENON + ARGON + NITROGEN + STACK + FLOW, LAMINAR + *OFF GAS

047256 *CONTINUED*
STRAUB CP
A REVIEW OF THE LITERATURE OF 1968 ON WASTEWATER AND WATERPOLLUTION CONTROL - INDUSTRIAL WASTE, RADIOACTIVE
29 PAGES, JOURNAL OF THE WATER POLLUTION CONTROL FEDERATION, VOL.41, PG. 1223-1251 (JUNE 1969)

THE FOLLOWING TOPICS RELATING TO RADIOACTIVE INDUSTRIAL WASTE WATER TREATMENT DISPOSAL WERE REVIEWED (WITH 167 REFERENCES) - U RECOVERY, WASTE WATER TREATMENT BY PRECIPITATION OF RADIONUCLIDES, SOLVENT EXTRACTION, ION EXCHANGE, ADSORPTION, UPTAKE ON NATURAL MATERIALS, ELECTRODIALYSIS, FIXATION, GROUND DISPOSAL, DISPOSAL IN THE HYDROSPHERE (OCEANS, RIVERS), UPTAKE ON SEDIMENTS, MONITORING, AND ANALYSIS.

ADSORPTION + BIBLIOGRAPHY + *FABRICATION + STRONTIUM + WASTE TREATMENT, LIQUID + *REACTOR, POWER + *WASTE DISPOSAL, LIQUID + *WASTE MANAGEMENT + ION EXCHANGE + *RADIOCHEMICAL PROCESSING + *RADIOISOTOPE + *FUEL REPROCESSING + *FUEL CONVERSION + *ORE CONVERSION + FUEL ELEMENTS

048899
STIGALL GE
EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN
NUS CORPORATION
NUS-TM-S-60 +. 17 PAGES, 1967

DISCUSSES THE QUESTION OF THE CAPACITY OF LAKE MICHIGAN TO RECEIVE AND ADEQUATELY DILUTE THE WASTES RELEASED TO IT. THE FIRST CONCERN IS THE LOCAL EFFECTS. THE SECOND IS A CONCERN OF THE TOTAL ASSIMILATIVE CAPACITY OF THE LAKE WITH A FUTURE OUTLOOK OF ADDED INJECTIONS. THE THIRD CONCERNS THE DILUTION OF A FEW PERCENT OF MPC BEFORE REACHING A SECOND PLANT FOUR AND ONE QUARTER MILES AWAY.

AVAILABILITY - NUS CORPORATION, 1730 M. STREET, N.W., WASHINGTON, D.C. 20036

CESIUM + DILUTION + FALLOUT + *MPC + STRONTIUM + WASTE DISPOSAL + DISPERSION + *WATER POLLUTION + *RECONCENTRATION + SYSTEM CAPACITY + ASSIMILATION + *LAKE MICHIGAN

049247
REICHERT SO
GEOLOGY PLAYS AN IMPORTANT ROLE IN RADIOACTIVE WASTE MANAGEMENT
E.I. DUPONT DE NEMOURS AND COMPANY, AIKEN, S.C.
6 PAGES, MINING ENGINEERING, VOL. 20, PG 98-103 (SEPTEMBER 1968)

THE PROGRAM FOR MANAGEMENT OF GASEOUS, LIQUID, AND SOLID WASTES AT THE SAVANNAH RIVER PLANT IS DISCUSSED. KNOWLEDGE OF THE CHARACTERISTICS OF THE WASTES AND THE ENVIRONMENT ARE NECESSARY FOR SAFE GROUND DISPOSAL. FAVORABLE ENVIRONMENTAL PARAMETERS INCLUDE A DEEP WATER TABLE WITH LONG FLOW PATH AND LOW GRADIENT TO THE STREAM AND SOIL WITH HIGH ION EXCHANGE CAPACITY AND MODERATE TO LOW PERMEABILITY. REDUCTION OF TRITIUM IS ACHIEVED BY GROUND WATER DILUTION. REDUCTION OF SR-90 IS ACHIEVED LARGELY BY GROUND WATER DILUTION BUT PARTIALLY BY SOIL ADSORPTION. ALL OTHER RADIONUCLIDES ARE READILY ABSORBED BY THE SOIL.

*GEOLOGY + STRONTIUM + WASTE DISPOSAL + *SAVANNAH RIVER PLANT + *WASTE MANAGEMENT + *HYDROLOGY

049348
THOMPSON TJ
AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS
1 PAGE, NUCLEAR INDUSTRY, PG 19 (JUNE 1970)

COMMISSIONER THOMPSON QUESTIONED INDUSTRYS CAPABILITY TO BUILD N-POWER REACTORS WITH ZERO EFFLUENT AND THE ADVISABILITY OF BUILDING THEM. HE EXPRESSED THESE REMARKS AT THE S. INTERSTATE NUCLEAR BOARD BRIEFING FOR STATE AND LOCAL OFFICIALS. IT IS UNDERSTOOD THAT HIS VIEWS DIFFER FROM THOSE OF HIS FELLOW COMMISSIONERS. HE SAYS IT IS MISLEADING TO THE PUBLIC TO SAY OR EVEN IMPLY ZERO RELEASE. THE TRITIUM WILL BE HELD AND RECIRCULATED UNTIL IT BUILDS UP TO SOME EQUILIBRIUM VALUE (20 YR), THEN IT STILL HAS TO GO INTO THE ENVIRONMENT. MINOR RELEASES FROM TIME TO TIME MAY IN THE LONG RUN PROVE TO BE ENVIRONMENTALLY BETTER THAN THE RELEASE OF A LARGE QUANTITY OF TRITIATED WATER.

FISSION PRODUCT RELEASE + *REACTOR, POWER + *WASTE MANAGEMENT + RADIATION EFFECT + INDUSTRY, NUCLEAR + *SPOKESMAN, AEC + (THOMPSON T)

049452
FRANCOIS B
PROGRESS REPORT OF THE MAIN STUDIES UP TO JANUARY 1, 1969
CENTRE D/ETUDES DE NUCLEAIRES, FONTENAY-AUX-ROSES, FRANCE
CEA-N-1246 +. 40 PAGES, 1970 (IN FRENCH)

THIS REPORT REVIEWS CERTAIN RESEARCH WHICH HAS BEEN CARRIED OUT IN 1968 IN THE LABORATORIES OF THE AEROSOL AND FINES GROUP. IN THE FIELD OF AEROSOLS, PROGRESS HAS BEEN MADE ON PRODUCTION, CAPTURE, AND OBSERVATION PROCESSES BOTH FROM THE FUNDAMENTAL POINT OF VIEW AND FROM THE POINT OF VIEW OF APPLICATIONS TO THE RADIOACTIVE CONTAMINATION OF BUILDINGS AND TO NON-RADIOACTIVE ATMOSPHERIC POLLUTION. IN THE FIELD OF FISSION GASES AND AEROSOLS, A MORE COMPLETE STUDY HAS BEEN MADE OF THE EFFECTS OF RADIATION ON THE IODINE-CONTAINING PRODUCTS LIABLE TO BE FORMED. THE APPLICATION TO THE TRAPPING OF THESE PRODUCTS HAS BEEN EXAMINED.

049452 *CONTINUED*
AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

AEROSOL + DIFFUSION + FISSION GAS RELEASE + *FISSION PRODUCT, IODINE + TESTING + *AEROSOL PROPERTIES + *CHARCOAL ADSORBER + CHARCOAL + *ORGANIC IODIDE + FILTERS

052245
FENIMORE JW
LAND BURIAL OF SOLID RADIOACTIVE WASTE DURING A TEN-YEAR PERIOD.
DPSPU-63-30-2 +.

WASTE DISPOSAL + WATER + SOIL + RADIOISOTOPE + SOLID + TRANSPORT

052442
JONES PH
HYDROLOGY OF RADIOACTIVE WASTE DISPOSAL IN THE MTR-ETR AREA, NATIONAL REACTOR TESTING STATION, IDAHO.
U. S. GEOL. SURV. PROFESS. PAPERS 450 PAGES 113-116 1962

DIFFUSION + TESTING + WASTE DISPOSAL + WATER + HYDROLOGY + REACTOR + SOIL + RADIOISOTOPE

053071
US GEOL SURVEY
HYDROLOGY OF WASTE DISPOSAL. NATIONAL REACTOR TESTING STATION, IDAHO. ANNUAL PROGRESS REPORT, 1962.
IDO-22044-USGS +.

TESTING + WASTE DISPOSAL + WATER + HYDROLOGY + REACTOR + SOIL + TRANSPORT + YEAR

053739
PARKER FL
RADIOACTIVE WASTES FROM FUSION REACTORS.
SCIENCE 159 PAGES 83-84 1968

DOSE + WASTE DISPOSAL + REACTOR + RADIOISOTOPE

055028
GAMERTSFELDER CC
STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF RADIOLOGICAL AND ENVIRONMENTAL PROTECTION
25 PAGES, FIGURES, TABLES, STATEMENT PRESENTED AT THE AEC RULEMAKING HEARINGS ON EFFLUENTS FROM LIGHT WATER COOLED NUCLEAR POWER REACTORS, JANUARY 20, 1972

DISCUSSES THE OPERATING EXPERIENCE OF MAJOR LIGHT-WATER-COOLED REACTORS WITH RESPECT TO DISCHARGES OF RADIOACTIVE MATERIALS IN LIQUID AND GASEOUS EFFLUENTS, INCLUDING THE COMPOSITION AND QUANTITIES OF WASTES RELEASED AND THE RESULTING DOSES TO PEOPLE AT THE BOUNDARY AND ELSEWHERE IN THE SURROUNDINGS.

AVAILABILITY - C. C. GAMERTSFELDER, ASST. DIR., USAEC DIVISION OF RADIOLOGICAL AND ENVIRONMENTAL PROTECTION, WASHINGTON, D. C.

EFFLUENT + MPC + WATER, DRINKING + OPERATING EXPERIENCE SUMMARY + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + POPULATION EXPOSURE + DOSE MEASUREMENT, EXTERNAL + DOSE CALCULATION, EXTERNAL + *RADIOACTIVITY RELEASE + CONCENTRATION

056491
NEW DESIGN SET IN NUCLEAR PLANT
THE NEW YORK TIMES, NEW YORK, MAY 10, 1970

WESTINGHOUSE ANNOUNCES DEVELOPMENT OF A N-POWER PLANT DESIGN THAT WILL ELMINATE ANY DISCHARGE OF RADIOACTIVITY TO ENVIRONMENT UNDER NORMAL OPERATING CONDITIONS. DESIGN COMPLETELY ELIMINATES RELEASE OF TRITIUM, CONFINING IT WITHIN THE SYSTEM AND REMOVED FOR PROCESSING ONLY ONCE OR TWICE DURING 40-YR LIFE OF THE N-PLANT. THE SYSTEM WILL BE INSTALLED AT BOTH 1.1-MWE ZION PLANTS TO ELIMINATE NUCLIDE DISCHARGES INTO LAKE MICHIGAN.

ECONOMICS + FISSION PRODUCT RELEASE + *REACTOR, POWER + *ZION 1 (PWR) + *ENVIRONMENTAL CONTROL MEASURE + LAKE MICHIGAN + INDUSTRY, NUCLEAR

056882
WERNER RW
HEAT PIPES FOR RECOVERY OF TRITIUM IN THERMONUCLEAR REACTOR BLANKETS
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA
UCRL-72329 +. 7 PAGES, MARCH 18, 1970

CONTROLLED THERMONUCLEAR REACTORS, USING DEUTERIUM-THERIUMS A FUEL FOR THE FUSION REACTION,

056882 *CONTINUED*
REQUIRE A MEANS OF SPEARATING TRITIUM SO THAT CYCLE CONTINUITY IS MAINTAINED. THIS PAPER SUGGESTS A UNIQUE WAY FOR SATISFYING THE TRITIUM. IT IS PROPOSED THAT HEAT PIPES USING SODIUM AS A WORK-FLUID BE USED AS TRITIUM TRANSPORTERS IN THE BLANKET STRUCTURE OF A FUSION REACTOR. THE TRITIUM PRODUCED IN THE LITHIUM MODERATOR OF THE BLANKET WOULD BE PASSED THROUGH THE HEAT PIPE TUBE WALL AND TRANSPORTED WITHIN THE HEAT-PIPE BODY TO AN ACCESSIBLE PROCESSING POINT OUTSIDE THE BLANKET. BY DIFFUSION THROUGH THE TUBE WALL TO A VACUUM ENVIRONMENT FOR THE SECOND TIME, THE TRITIUM WOULD BE BROUGHT OUTSIDE THE HEAT-PIPE BODY AND THEN PROCESSED FOR RE-CYCLING.

CONTROL SYSTEM + COVER GAS + *COOLANT PURIFICATION SYSTEM + HEAT PIPE + *REACTOR, THERMONUCLEAR

057309
PARKER FL
STATUS OF RADIOACTIVE WASTE DISPOSAL IN U.S.A.
VANDERBILT UNIVERSITY, NASHVILLE, TN
26 PAGS, JOURNAL OF THE SANITARY ENGINEERING DIVISION, PROCEEDINGS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS, VOL. 95, PG. 439-464 (JUNE 1969)

THE MANAGEMENT OF RADIOACTIVE WASTES HAS NOT PROVEN TO BE A DETERENT TO A NUCLEAR POWER ECONOMY. THE MAJOR PROBLEMS REMAINING ARE METHODS FOR THE REMOVAL OF NOBLE GASES AND TRITIUM, DEVELOPMENT OF FUEL REPROCESSING METHODS, AND UNDERSTANDING OF THE MOVEMENTS OF RADIONUCLIDES IN THE ENVIRONMENT. THE EFFECTS OF RELEASES OF RADIOACTIVE MATERIALS UPON MAN, AND A COMPARISON OF THESE EFFECTS WITH SIMILAR EFFECTS PRODUCED BY NATURAL CAUSES, ARE ALSO CONSIDERED. THE ESTIMATED AVERAGE RADIATION EXPOSURES TO THE GONADS IN THE U.S. IN 1963 WAS 193.2 MREM, AND ABOUT 1 PERCENT OF THIS DOSE WAS DUE TO THE NUCLER INDUSTRY. RADIOACTIVE WASTES ARE NOT AT PRESENT, AND DO NOT APPEAR TO BE IN THE FUTURE, A DETERENT TO A NUCLEAR-POWER ECONOMY, AND CANCERS AND GENETIC DEATHS DUE TO A NUCLEAR-POWER ECONOMY ARE SMALL IN COMPARISON TO CANCERS AND GENETIC DEATHS DUE TO NATURAL CAUSES.

ECONOMICS + EFFLUENT + *WASTE DISPOSAL + WASTE MANAGEMENT + ENVIRONMENT + *UNITED STATES + *FUEL REPROCESSING + *GAS + EFFECT + COMPARISON

058861
LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
BRH/NERHL 70-2 +. 59 PAGES, 19 FIGURES, 23 TABLES, NOVEMBER 1970

LIQUID WASTE EFFLUENTS FROM NUCLEAR FUEL SERVICES WERE STUDIED DURING A SIX-MONTH PERIOD MAY THROUGH OCTOBER 1969. CONCENTRATIONS AND AMOUNTS OF INDIVIDUAL RADIONUCLIDES DISCHARGED FROM THE PLANT WERE MEASURED AND THE AMOUNTS OF SEDIMENTATION OF INDIVIDUAL RADIONUCLIDES IN THE LAGOON SYSTEM WERE ESTIMATED. TRITIUM, RUTHENIUM-106, STRONTIUM-90, CESIUM-137 AND CESIUM-134 WERE THE PRINCIPAL RADIONUCLIDES DISCHARGED TO THE ENVIRONMENT DURING THIS PERIOD. DURING JUNE AND NOVEMBER 1969 SIMULTANEOUS SAMPLING WAS CARRIED OUT AT THE POINT OF DISCHARGE OF THE WASTE AND SEVERAL LOCATIONS ON THE BUTTERMILK AND CATTARAUGUS CREEKS. TRITIUM, RUTHENIUM-106, AND STRONTIUM-90 WERE THE RADIONUCLIDES PRESENT IN THE HIGHEST CONCENTRATIONS IN THESE STREAMS DURING THESE PERIODS. STREAM DILUTION AND ABSORPTION FACTORS WERE CALCULATED FOR INDIVIDUAL RADIONUCLIDES AT VARIOUS LOCATIONS ALONG THE STREAM SYSTEM. A COMPARISON OF THE CONCENTRATIONS OF THE RADIONUCLIDES IN CATTARAUGUS CREEK WITH 10CFR20 DISCHARGE CONCENTRATIONS LIMITS. ALL RADIONUCLIDES WERE WELL BELOW CONCENTRATION LIMITS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + MEASUREMENT + RUTHENIUM + STRONTIUM + REGULATION, AEC + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RADIOACTIVITY RELEASE + NFS + FUEL REPROCESSING + MONITORING PROGRAM, ENVIRONMENTAL + CONCENTRATION + SEDIMENT

061944
MOELLER WD + GOLDIN AS
ENVIRONMENTAL PROTECTION FOR NUCLEAR APPLICATIONS
HARVARD SCHOOL OF PUBLIC HEALTH
13 PAGES, JOURNAL OF THE SANITARY ENGINEERING DIVISION, ASCE, VOL. 95, PG. 373-385 (JUNE 1969)

CURRENT RECOMBINATIONS ARE SUMMARIZED ON ENVIRONMENTAL RADIATION PROTECTION, AND SOME AREAS MOST URGENTLY IN NEED OF FURTHER RESEARCH ARE OUTLINED. THE CUMULATIVE AMOUNT OF A FEW FISSION PRODUCTS FROM THE ENTIRE NUCLEAR INDUSTRY IN THE FUTURE IS ALSO ESTIMATED. OF THE PRODUCTS GENERATED IN NUCLEAR FISSION, THREE ARE DISCHARGED TO THE ENVIRONMENT IN WHOLE OR IN PART, AND ARE THEREFORE OF PARTICULAR SIGNIFICANCE IN TERMS OF ENVIRONMENTAL PROTECTION. THESE INCLUDE I-131, KR-85, AND TRITIUM. BARRIERS AVAILABLE TO THE ENVIRONMENTAL ENGINEER FOR PREVENTING THE RELEASE OF RADIOACTIVE MATERIALS FROM A REACTOR INSTALLATION ARE CITED. REACTOR CONTAINMENT DESIGN IS REVIEWED, AS ARE CLEANUP PROCEDURES TO BE USED AFTER AN ACCIDENT. CLEAN-UP TECHNIQUES, IN USE OR UNDER DEVELOPMENT, INCLUDE WATER SPRAYS, AIR FILTRATION AND RECIRCULATION, AND FOAM ENCAPSULATION. ENVIRONMENTAL SURVEILLANCE UNDER NORMAL AND ACCIDENT CONDITIONS IS DISCUSSED.

CODES AND STANDARDS + CONTAINMENT DESIGN + DECONTAMINATION + GUIDE + IODINE + KRYPTON + EMERGENCY PROCEDURE + RADIOACTIVITY RELEASE + ENVIRONMENT + SURVEILLANCE PROGRAM + MONITOR, AREA

062005
BELTER WG
RECENT DEVELOPMENTS IN THE U.S. LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT PROGRAM - AN OVERVIEW FOR THE 1970S

062005 *CONTINUED*
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
SM-137/61 + STI/PUB-264 + CONF-700905 +. 22 PAGES, 4 FIGURES, 6 TABLES, 26 REFERENCES, PAPER PRESENTED AT THE IAEA SYMPOSIUM ON MANAGEMENT OF LOW- AND INTERMEDIATE-LEVEL RADIOACTIVE WASTES, AIX-EN-PROVENCE, FRANCE, SEPTEMBER 7-11, 1970

SUMMARIZES SOME OF THE MORE RECENT U.S. EXPERIENCE IN POWER-REACTOR WASTE MANAGEMENT AND ALSO OTHER DEVELOPMENTS WHICH HAVE OCCURRED SINCE THE 1965 SYMPOSIUM IN THE AREAS OF LAND BURIAL, DEEP WELL INJECTION, AND SEA DISPOSAL, AS THEY RELATE TO PRESENT TRENDS IN WASTE MANAGEMENT POLICY.

NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

*IAEA + IODINE + *KRYPTON + *WASTE DISPOSAL + XENON + *WASTE MANAGEMENT + *ENVIRONMENT + THERMAL POLLUTION + POPULATION RESPONSE + POLLUTION

062009
SLANSKY CM
FUTURE GOALS IN RADIOACTIVE WASTE MANAGEMENT
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA
SM-137/67 + STI/PUB-264 + CONF-700905 +. 11 PAGES, 3 REFERENCES, PAPER PRESENTED AT THE IAEA SYMPOSIUM ON MANAGEMENT OF LOW- AND INTERMEDIATE-LEVEL RADIOACTIVE WASTES, AIX-EN-PROVENCE, FRANCE, SEPTEMBER 7-11, 1970

REVIEWS POSSIBLE REDUCTIONS OF RADIOACTIVE WASTE DISCHARGED TO THE ENVIRONMENT. GIVES A FEW VALUES FOR THE QUANTITY OF RADIOACTIVE MATERIALS PRODUCED AND HOW THE VARIOUS DISPOSAL POLICIES APPLY. ECONOMICS OF WASTE DISPOSAL ARE DISCUSSED.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

*ECONOMICS + *IAEA + *WASTE DISPOSAL + AUSTRIA + *WASTE MANAGEMENT + FUEL REPROCESSING + R AND D PROGRAM

062381
SMITH JM + KENT CE
NUCLEAR PLANT ENVIRONMENTAL CONTROL
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
12 PAGES, 6 FIGURES, 4 TABLES, 6 REFERENCES, PAPER PRESENTED AT THE AMERICAN POWER CONFERENCE, CHICAGO, ILLINOIS, APRIL 20-22, 1971

CONCLUSIONS - A REASONABLE DESIGN OBJECTIVE FOR NUCLEAR POWER PLANTS IS OF THE ORDER OF 5 MILLIREMS PER YEAR TO ANY ACTUAL NEIGHBOR, AND THAT SATISFIES THE OBJECTIVE OF AS-LOW-AS-PRACTICABLE. AUGMENTED SYSTEMS HAVE BEEN DEVELOPED AND ARE AVAILABLE FOR FURTHER REDUCTION OF RADIONUCLIDES IN EFFLUENTS. STARTUP PROBLEMS IN EFFLUENT CONTROL HAVE BEEN OF CHEMICAL PROCESS STARTUP NATURE, AND SATISFACTORY SOLUTIONS ARE BEING APPLIED. BWRS HAVE SHOWN EFFLUENT CONTROL WITH A HIGH DEGREE OF COMPLIANCE WITH LICENSED PERMISSIBLE RATES.

*REACTOR, BWR + MPC + REGULATION, AEC + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + *POPULATION EXPOSURE + *WASTE MANAGEMENT

065087
VAUGHAN RF
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-1550 VOL. 2, PT. 2 +. 108 PAGES, MARCH 1971

62 RESEARCH TOPICS ARE REPORTED. A SMALL BUT IMPORTANT PART OF THE TOTAL EFFORT IS IN PROGRAMS CONCERNED WITH THE ARID LANDS ECOLOGY RESERVE (FOR WHICH THE LONG RANGE OBJECTIVE IS TO STUDY THE EFFECT OF ENVIRONMENTAL MODIFICATIONS BY WILDFIRE, IRRIGATION, GRAZING, HERBICIDAL APPLICATIONS, ETC.). EFFORTS ARE DESCRIBED TO PERMIT CONSERVATION-ORIENTED GROUPS TO GAIN A BETTER UNDERSTANDING OF AECS LONG INTEREST AND SUPPORT IN ECOLOGY. SEVERAL ELEMENTS OF THE SIMULATION OF THE LICHEN-CARIBOU-ESKIMO FOOD CHAIN ARE BEING REFINED. EFFORTS ARE CONTINUING IN REACTOR SITING PROBLEMS INCLUDING INJURY TO FISH BOTH FROM THERMAL EFFECTS AND FROM POTENTIAL HAZARDS ASSOCIATED WITH CHRONIC RADIOACTIVITY DISCHARGE. LONG-TERM STUDIES OF CANADA GOOSE POPULATIONS ON THE COLUMBIA RIVER ARE REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + FIRE + WASTE DISPOSAL + ZINC + RIVER, COLUMBIA + *BATTELLE NORTHWEST + ECOSYSTEM, GRASSLAND + DESTRUCTIVE WIND + SOIL PROPERTY, IN SITU + THERMAL POLLUTION + *RADIONUCLIDE UPTAKE + ECOSYSTEM, AQUATIC + FOOD CHAIN + ECOSYSTEM + RADIATION EFFECT + ECOSYSTEM, ARCTIC + ECOSYSTEM, DESERT + *RESEARCH, GOVERNMENT + PLANT, SEEDLING

065152
AEC LOWERING PLANT RADIOACTIVE EMISSIONS CEILING A HUNDREDFOLD
1 PAGE, NUCLEONICS WEEK, 12(23), PAGE 3, (JUNE 10, 1971)

THE AEC HAS AT LAST PUT A NUMBER TO ITS AS LOW AS PRACTICABLE CRITERION FOR POWER-REACTOR RADIOACTIVITY EMISSION - 5 MREM A YEAR AT THE SITE BOUNDARY. THIS IS A HUNDREDFOLD REDUCTION IN THE PRESENTLY PERMITTED MAXIMUM EMISSION RATE. A PLANT OPERATING AT 5 MREM WOULD EXPOSE THE

065152 *CONTINUED*
TOTAL POPULATION TO 1 MREM A YEAR OR LESS, ABOUT 1% OF BACKGROUND RADIATION. HITHERTO, THE TOTAL-POPULATION EXPOSURE LIMIT HAD BEEN SET AT 170 MREM. AEC STRESSES THAT ITS PROPOSED GUIDES DO NOT REPLACE THE 500-MREM AND 170-MREM LIMITS PRESCRIBED BY U.S. AND INTERNATIONAL EXPERTS AND ESTABLISHED BY THE FORMER FEDERAL RADIATION COUNCIL. THESE WILL STILL STAND, BUT SINCE REACTOR-TECHNOLOGY ADVANCES MAKE 5 MREM AT SITE BOUNDARY QUITE PRACTICABLE THEN THE LIMIT WILL BE SET AT THAT FIGURE. THE NEW GUIDES, WHICH WILL GO INTO EFFECT IN ABOUT 60 DAYS, HAVE HAD THE IMMEDIATE EFFECT OF INITIATING OR HURRYING ALONG PLANS TO MODIFY SIX PLANTS IN OPERATION OR UNDER CONSTRUCTION IN ORDER TO REDUCE RADIOACTIVITY EMISSIONS. THESE ARE HUMBOLDT BAY, THE THREE DRESDEN AND TWO QUAD CITIES UNITS.

IODINE + MPC + *REGULATION, AEC + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + POPULATION EXPOSURE + *WASTE MANAGEMENT + PARTICLE, RADIOACTIVE

065195
ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON ENVIRONMENTAL QUALITY
326 PAGES, COUNCIL ON ENVIRONMENTAL QUALITY, (AUGUST 1970)

REPORT DESCRIBES CONDITIONS OF OUR ENVIRONMENT, IDENTIFIES MAJOR TRENDS, PROBLEMS, ACTIONS UNDER WAY, AND OPPORTUNITIES FOR THE FUTURE. COUNCIL ADMITS PRESENT INSUFFICIENCY OF ENVIRONMENTAL QUALITY INDICATORS OR SYSTEMS, HENCE THAT THIS REPORT IS INCOMPLETE AND CAN ONLY BRING TOGETHER PROBLEMS AND ISSUES. OF PARTICULAR INTEREST TO NUCLEAR COMMUNITY IS SECTION ON RADIATION, I.E., EFFECTS OF RADIATION, SOURCES OF RADIATION, REACTOR-SAFETY RECORD, RADIOACTIVE WASTE STORAGE AND DISPOSAL, STANDARDS FOR PROTECTION AGAINST RADIATION, AND WHAT NEEDS TO BE DONE -- (1) RESEARCH ON EFFECTS OF LOW-LEVEL DOSES AND CUMULATIVE EFFECT, (2) PROBLEMS ARISING FROM MEDICAL USES AND FROM CONSUMER PRODUCTS, (3) CAREFUL REGULATION AND CONTROL OF RELEASES FROM REACTORS, UNDERGROUND TESTING, AND TRANSPORTATION, STORAGE, AND DISPOSAL OF RADIOACTIVE WASTES.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

CODES AND STANDARDS + EFFLUENT + KRYPTON + REGULATION, STATE + WASTE STORAGE + ELECTRIC POWER + BIOTA + WASTE MANAGEMENT + *RADIATION SAFETY AND CONTROL + *ENVIRONMENT + FUEL REPROCESSING + SURVEY + DATA COLLECTION + EFFECT, GENETIC + POLLUTION + RADIATION EFFECT + RADIATION EXPOSURE + AGENCY, FEDERAL + N-POWER, SAFETY OF + SPOKESMAN, FEDERAL

065374
PUBLIC ACCEPTANCE NO PROBLEM IN UNITED KINGDOM
2 PAGES, NUCLEAR NEWS, 13(4), PAGE 25-26, (APRIL 1970)

THE PUBLIC IN U.K. SEEMS TO TAKE A MORE PRAGMATIC APPROACH TO N-POWER. THERE IS NO HUE AND CRY ABOUT THERMAL EFFECTS OR RADIATION RELEASES. THEY VIEW GROWING POWER REQUIREMENTS VERY SERIOUSLY. UKAEA DOES NOT HAVE MULTIPLE ROLE OF DEVELOPING, PROMOTING, AND REGULATING N-POWER. IN ESTABLISHING A NEW POWER SITE, BRITISH APPEAR TO MAKE MORE EFFORT TO INFORM LOCAL COMMUNITY. WRITER DISCUSSES REGULATION OF GASEOUS AND LIQUID DISCHARGES FROM N-PLANTS, E.G., ALL LIQUID ACTIVITY HELD IN DOUBLE-WALLED TANKS, THEN SLOWLY BLED INTO OCEAN. SEVERAL YEARS AGO, HARD WINTER DESTROYED OYSTER BEDS. ONLY BEDS TO SURVIVE WERE THOSE WARMED BY BRADWELL N-PLANT. BIRD LOVERS WERE WORRIED OVER DUNGENESS STATION. NOW LOCAL WARDEN REPORTS INCREASED BIRD POPULATION AND PRESENCE OF 4 NEW SPECIES. TRAWSFYNYDD IS ONLY N-PLANT SITUATED AND COOLED BY ARTIFICIAL LAKE. ONLY NOTICEABLE EFFECT TO DATE IS LARGER AND FASTER GROWTH OF TROUT.

ADMINISTRATIVE CONTROL + KRYPTON + OCEAN AND SEA + SITING, REACTOR + *UNITED KINGDOM + ARGON + *REACTOR, POWER + EMERGENCY PROCEDURE + RADIOACTIVITY RELEASE + ENVIRONMENT + THERMAL POLLUTION + INTERNATIONAL + AQUATIC ORGANISM + MOLLUSC + ANIMAL, BIRD + WASTE HEAT, WATER + INDUSTRY, UTILITY + *PUBLIC RELATIONS

065420
SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC
70 PAGES, FIGURES, TABLES, HEARINGS BEFORE JCAE CONF. ON ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER, (OCTOBER 30, 1969)

A COMPREHENSIVE SUMMARY OF THE ACTIVITIES OF THE AEC IN ENVIRONMENTAL STUDIES IS PRESENTED BY THE SPEAKER. CONCERNING SOMATIC EFFECTS, HE REMARKS THAT AT PRESENT, IT IS NOT CLEAR WHETHER SOME OBSERVED LATE EFFECTS OF RADIATION HAVE A THRESHOLD DOSE FOR PRODUCTION. HE DETAILS SOMATIC AND GENETIC EFFECTS. DROSOPHILA AND MOUSE EXPERIMENTS, TRITIUM AND KRYPTON BIOLOGICAL-HALF-LIVES, NATURAL PRODUCTION AND CONCENTRATION OF FORMER, DNA MECHANISM, AND HUMAN EXPOSURE TO BOTH GASES. RADIOACTIVE-EFFLUENT-CONTROL RESEARCH AND DEVELOPMENT ARE REVIEWED. THESE INCLUDE DESCRIPTIONS OF THE MANY PROCESSES EXAMINED AND USED IN RECOVERING AND TREATING NUCLIDES FROM PROCESSING WASTE STREAMS. RADIOACTIVE GAS CONTROL MEASURES ARE ALSO COVERED. THE FATE OF HEAVY-METAL NUCLIDIC DISCHARGES INTO STREAMS IS COVERED, AS ARE THE VARIOUS METHODS OF DISPOSING OF THE WASTES BY SUCH METHODS AS HYDRAULIC FRACTURING -- AND DISPOSAL OF RADIOACTIVE GASES INTO POROLS AND UNDERGROUND FORMATIONS. OTHER TOPICS EVALUATED AND DISCUSSED IN DETAIL CONCERN METEOROLOGICL AND THERMAL EFFECTS STUDIES.

CESIUM + COBALT + FISSION PRODUCT RELEASE + GEOLOGY + RUTHENIUM + STRONTIUM + ZINC + POPULATION EXPOSURE + WASTE MANAGEMENT + HYDROLOGY + *RADIATION SAFETY AND CONTROL + RADIOACTIVITY RELEASE + METEOROLOGY + THERMAL POLLUTION + CALVERT CLIFFS 1 (PWR) + DATA COLLECTION + EFFECT, GENETIC + EFFECT, SOMATIC + RADIATION EFFECT + AGENCY, AEC + CHESAPEAKE BAY + *N-POWER, SAFETY OF + *SPOKESMAN, AEC

065656
NEWS RELEASES, USAEC
ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
AEC NEWS RELEASE 34(2), AUGUST 25, 1971

THE FOLLOWING NEWS ITEMS WERE RELEASED IN ISSUE VOLUME 2, NO. 34, DATED AUG. 25, 1971. NO. 0-138 - AEC AND NEW YORK ENTER INTO COOPERATIVE ARRANGEMENT FOR ENVIRONMENTAL RADIATION MONITORING. 0-139 - AEC TO ESTABLISH CONTROLS ON TRITIUM. 0-140 - RESCHEDULED PROCEEDINGS TO HEAR ORAL ARGUMENTS AND RECEIVE EVIDENCE IN THE COLUMBIA UNIVERSITY RESEARCH REACTOR LICENSING PROCEEDINGS. 0-141 - AEC AND MARYLAND ENTER INTO COOPERATIVE ARRANGEMENT FOR ENVIRONMENTAL RADIATION MONITORING. 0-142 - AEC EXTENDS DATE FOR APPLICATIONS CONCERNING URANIUM ENRICHMENT TECHNOLOGY. 0-143 - ANNOUNCES MEETING OF REGULATORY STAFF AND OTHER INTERESTED GROUPS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*EFFLUENT + LICENSE STATUS + REGULATION + *URANIUM + REACTOR, POWER + *MONITOR, ENVIRONMENTAL + *REGULATION, AEC + LICENSE APPLICATION + RADIATION SAFETY AND CONTROL + *OPERATING LICENSE PROCESS + *ENRICHMENT FACILITY

065953
WRIGHT JH
ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS
4 PAGES, J. INST. NUCL. ENG., 12, PAGE 8-12, (JAN-FEB, 1971)

RADIATION EFFECTS EVEN IN A REGION CONTAINING NUCLEAR PLANTS ON 32-KM CENTER TO CENTER LOCATIONS ARE STILL QUITE NEGLIGIBLE. INFORMATION ON THE RADIONUCLIDE RELEASE IN LIQUID AND GASEOUS EFFLUENTS SHOULD BE COLLECTED TO ASSESS THE FUTURE ENVIRONMENTAL RADIONUCLIDE DISTRIBUTION, ALTHOUGH THERE IS NO SHORT RANGE PROBLEM FROM BUILD-UP IN THE BIOSPHERE. THE MANAGEMENT OF KRYPTON AND TRITIUM SHOULD BE MODIFIED WITHIN THE NEXT TWO DECADES.

*KRYPTON + REACTOR, PWR + RADIATION IN PERSPECTIVE + WASTE DISPOSAL, ATMOSPHERIC + *BIOTA + WASTE DISPOSAL, RIVER + *RADIONUCLIDE UPTAKE + N-POWER FORECAST

066059
LOGSDON JE + HICKEY JWN
RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM A NUCLEAR FUEL REPROCESSING PLANT
7 PAGES, RADIOBIOLOGICAL HEALTH DATA AND REPORTS, 12(6), PAGE 305-312, JUNE 1971

THE NUCLEAR FUEL SERVICES FUEL REPROCESSING PLANT HAS BEEN IN OPERATION SINCE 1966 AND HAS PROVIDED VALUABLE EXPERIENCE IN WASTE MANAGEMENT PROBLEMS RELATED TO THIS TYPE OF FACILITY. THE LARGE QUANTITIES OF RADIOACTIVITY WHICH MUST BE CONTROLLED AT A NUCLEAR FUEL REPROCESSING PLANT VIRTUALLY ELIMINATE DISCHARGE-AND-DILUTION AS A SATISFACTORY METHOD OF DISPOSING OF RADIONUCLIDES WHICH CONCENTRATE THROUGH ENVIRONMENTAL MEDIA. RADIONUCLIDES SUCH AS STRONTIUM-90, RUTHENIUM-106, CESIUM-137, CESIUM-134, COBALT-60, TRITIUM, AND KRYPTON-85 HAVE BEEN FOUND IN ENVIRONMENTAL MEDIA AROUND NFS. THESE INDICATE THAT PATHWAYS TO THE PUBLIC DO EXIST AS A RESULT OF OPERATION OF THE FACILITY. HOWEVER, STUDIES TO DATE HAVE INDICATED THAT TYPICAL POPULATION DOSES IN THE VICINITY OF NFS ARE NOT SIGNIFICANTLY DIFFERENT FROM DOSES RECEIVED IN OTHER PORTIONS OF THE STATE.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

CESIUM + COBALT + *EFFLUENT + *KRYPTON + RUTHENIUM + *STRONTIUM + *WASTE DISPOSAL + *POPULATION EXPOSURE + *CRITICAL NUCLIDE PATHWAY + RADIATION SAFETY AND CONTROL + RADIOACTIVITY RELEASE + *ENVIRONMENT + NFS + *FUEL REPROCESSING + MAN + DISCHARGE

067891
FOLSOM TR
NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS
SCRIPPS INSTITUTION OF OCEANOGRAPHY, LA JOLLA, CALIFORNIA
TID-25774 +, 16 PAGES, MARCH 15, 1971

GIVES AN EXAMPLE OF THE LIMITED AND SOMEWHAT BIASED INFORMATION THAT HAS BEEN PRESENTED TO A WATER-QUALITY-CONTROL BOARD BY A TYPICAL INVESTOR-OWNED POWER COMPANY. PRESENT REGULATIONS MAKE IT NECESSARY ONLY TO MONITOR CRUDELY THE ACTIVITY DISCHARGED--SUFFICIENT TO AVOID EXCEEDING STANDARDS, HARDLY APPROPRIATE FOR DESCRIBING ENVIRONMENTAL DAMAGE. A BETTER INSPECTION SHOWS THAT AT LEAST ONE NUCLIDE HAS ACCUMULATED IN AT LEAST TWO SPECIES. A SIMPLE CALCULATION SUGGESTS THAT THE MUCH LARGER AMOUNTS OF TRITIUM COMING FROM THIS PLANT PROBABLY HAS ALREADY ALTERED LARGE AREAS OF THE COASTAL OCEAN MEASURABLY. IN FACT, THIS RADIOACTIVE TAG MIGHT BE USEFUL TO INDICATE HOW THE OCEAN DISPOSES OF OTHER COASTAL POLLUTIONS. THESE ACTIVITIES CERTAINLY MUST NOW BE TAKEN INTO CONSIDERATION AS BACKGROUNDS--BY SCIENTISTS AT LEAST.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*CODES AND STANDARDS + *EFFLUENT + REACTOR, PWR + *WASTE DISPOSAL, OCEAN + *SAN ONOFRE 1 (PWR) + MONITOR, ENVIRONMENTAL + *REGULATION, AEC + REACTOR POWER + RADIOACTIVITY RELEASE + RADIOISOTOPE + *SURVEILLANCE PROGRAM + REGULATION, FEDERAL + CONCENTRATION + OCEAN, PACIFIC

069814
LAGACHE MP + BLATCHFORD JD
PWR PLANT LIMITED-RELEASE RADWASTE SYSTEM DESIGN

069814 *CONTINUED*
BECHTEL CORPORATION
12 PAGES, 3 FIGURES, 2 TABLES, PAPER PRESENTED AT THE AMERICAN POWER CONFERENCE, 34TH ANNUAL MEETING, CHICAGO, ILLINOIS, APRIL 18-20, 1972

THE RADWASTE SYSTEM DESIGN BRIEFLY DESCRIBED ILLUSTRATES A BASIC APPROACH WHICH PRESENTLY APPEARS TO BE MOST SUITABLE FOR POWER PLANT APPLICATION. IT UTILIZES A RELATIVELY SIMPLE SEQUENCE OF FIELD-PROVED PROCESSES TO REDUCE COSTS AND TO PROVIDE RELIABLE PERFORMANCE WITH LOW RADIOACTIVE EXPOSURE TO OPERATING PERSONNEL. YET IT INCLUDES ENOUGH CAPABILITY MARGIN AND FLEXIBILITY TO ALLOW FOR POSSIBLE OFF-DESIGN SYSTEM OPERATING CONDITIONS, AND IT IS BELIEVED CAPABLE OF REDUCING WHOLE-BODY RADIATION EXPOSURE OFF-SITE TO APPROXIMATELY 1% OF NATURAL BACKGROUND. THIS DESIGN CAN BE READILY ADJUSTED TO SATISFY THE PARTICULAR REQUIREMENTS OF A SPECIFIC SITE, PWR TYPE, AND/OR OWNER OPERATING PROCEDURES.

AVAILABILITY - J. D. BLATCHFORD, PROJECT ENGINEER, BECHTEL CORPORATION, SAN FRANCISCO, CALIFORNIA

DESIGN CRITERIA + *REACTOR, PWR + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + WASTE DISPOSAL, SOLID + *WASTE MANAGEMENT + *WASTE TREATMENT, EQUIPMENT

072136
RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE
EUROPEAN NUCLEAR ENERGY AGENCY, FRANCE
126 PAGES, PARIS, EUROPEAN NUCLEAR ENERGY AGENCY, 1971

THE PRINCIPLES AND PRACTICES APPLIED TO RADIOACTIVE WASTE MANAGEMENT IN WESTERN EUROPE ARE REVIEWED. THE ORIGIN AND DIFFERENT TYPES OF RADIOACTIVE WASTES ARE DISCUSSED, AND DATA ON THE PRODUCTION OF GASEOUS, LIQUID, AND SOLID RADIOACTIVE WASTES IN WESTERN EUROPE DURING 1970 ARE PRESENTED. THE GENERAL SAFETY, TECHNICAL, AND ECONOMIC ASPECTS OF WASTE MANAGEMENT ARE REVIEWED. SPECIFIC TREATMENT AND STORAGE PRACTICES AT VARIOUS EUROPEAN NUCLEAR FACILITIES AND THE OUTSTANDING WASTE MANAGEMENT PROBLEMS, NOTABLY SAFE PERMANENT STORAGE OF HIGH-LEVEL LIQUID WASTES AND THE CONTROL OF 85KR AND TRITIUM RELEASES TO THE ATMOSPHERE, ARE DESCRIBED.

*KRYPTON + SAFETY REVIEW + *WASTE DISPOSAL + *WASTE STORAGE + WASTE DISPOSAL, ECONOMICS + *WASTE MANAGEMENT + RADIATION SAFETY AND CONTROL + GAS + LIQUID + SOLID + PRODUCTION

072213
HUNZINGER W
ESTIMATION OF TRITIUM DISCHARGES INTO LLW-STREAMS
EUROPEAN COMPANY FOR CHEMICAL PROCESSING OF IRRADIATED FUEL, MOL, BELGIUM
EUROCHEMIC-TR-267 + NP-18737 +. 17 PAGES, NOVEMBER 1970

THE TRITIUM TRANSFERRED AS LLW TO THE CEN WASTE TREATMENT STATION AND DISCHARGED TO THE MOL NETHE DURING THE PERIOD JANUARY 1969 - JULY 1970 WAS COMPARED WITH THE CALCULATED AMOUNT OF H-3 PRODUCED BY FISSION. THE DISCHARGES ARE BETWEEN 40 AND 80% OF THE CALCULATED QUANTITIES, IF SOURCES OF H-3 PRODUCTION OTHER THAN FISSION ARE NEGLECTED AND A PRODUCTION RATE OF 16 MCI/MWD FROM FISSION OF U-235 AND 22 MCI/MWD FROM FISSION OF PU-239 IS ASSUMED. THE TIME DELAY BETWEEN FUEL DISSOLUTION AND ARRIVAL OF THE TRITIUM IN THE RIVER DOES NOT EXCEED 2 MONTHS.

FUEL BURNUP + PLUTONIUM + *WASTE TREATMENT, LIQUID + *FUEL REPROCESSING

072593
RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE
EUROPEAN NUCLEAR ENERGY AGENCY
126 PAGES, 3 FIGURES, 4 TABLES, SEPTEMBER 1971

A SIMPLIFIED GENERAL REVIEW OF PRACTICES APPLIED TO MANAGEMENT OF RADIOACTIVE WASTES IN WESTERN EUROPE. BUT THE COMPLEXITY AND THE MAGNITUDE OF THE PROBLEM IS INDICATED BY HAVE PROVED MANAGEABLE AND AT A VERY HIGH STANDARD OF SAFETY FOR THE PERSONNEL AND THE ENVIRONMENT. MEANS ARE PROVIDED WHEREBY PUBLIC-HEALTH AUTHORITIES MAY REGULATE, IN THE PUBLIC INTEREST, RADIOACTIVE WASTE MANAGEMENT. THE WHOLE SCOPE OF WASTE-MANAGEMENT PRACTICES ARE DISCUSSED AND ENCOURAGEMENT GIVEN FOR PERIODIC REVIEW TO MAINTAIN THE HIGH STANDARDS OF ENVIRONMENTAL AND PUBLIC PROTECTION.

AVAILABILITY - EUROPEAN NUCLEAR ENERGY AGENCY

*ADMINISTRATIVE CONTROL + *CODES AND STANDARDS + ELEMENTS AND ISOTOPES + KRYPTON + REGULATION + *WASTE DISPOSAL + WASTE STORAGE + *WASTE TREATMENT + *ENEA + REACTOR, POWER + *WASTE MANAGEMENT + ICRP + RADIOISOTOPE + FUEL REPROCESSING

072709
YARBRO OO + NICHOLS JP + UNGER WE
ENVIRONMENTAL PROTECTION DURING FUEL PROCESSING
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-720522-5 +. 11 PAGES, FROM THE 72ND NATIONAL MEETING OF THE AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, ST. LOUIS, MISSOURI, MAY 21, 1972

THE REQUIRED REMOVAL OF PARTICULATE ACTIVITY FROM GASEOUS AND LIQUID EFFLUENTS CAN PROBABLY BE OBTAINED BY USE OF EXISTING TECHNOLOGY, PARTICULARLY IF THE VOLUME OF GASEOUS AND LIQUID EFFLUENTS ARE SUBSTANTIALLY REDUCED. THE MOST CHALLENGING TECHNICAL PROBLEMS ARISE IN THE

072709 *CONTINUED*
DEVELOPMENT OF SYSTEMS FOR THE REMOVAL AND CONTROL OF THE VOLATILE FISSION PRODUCTS, IN PARTICULAR I, KR-XE, AND H-3. IT IS IN THE AREA OF VOLATILE-FISSION-PRODUCT CONTROL THAT THIS PAPER DEALS IN SOME DETAIL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*EFFLUENT + IODINE + KRYPTON + *REGULATION + XENON + RADIATION SAFETY AND CONTROL + *RADIOACTIVITY RELEASE + NFS + *FUEL REPROCESSING + GAS + LIQUID + *FUEL, NUCLEAR

074874
NAKAJIMA K
MANAGEMENT OF FUEL REPROCESSING WASTES IN JAPAN
POWER REACTOR AND NUCLEAR FUEL DEVELOPMENT CORPORATION, TOKYO
CONF-721107 +. 13 PAGES, 4 FIGURES, PAPER PRESENTED AT THE SYMPOSIUM ON THE MANAGEMENT OF RADIOACTIVE WASTES FROM FUEL REPROCESSING, HELD IN PARIS, NOVEMBER 27-DECEMBER 1, 1972

PRESENTS PLANS FOR HIGHLY RADIOACTIVE LIQUID WASTE (HALW) TREATMENT INCLUDING A DESCRIPTION OF EQUIPMENT FOR THE FIRST FIVE YEARS AND THE PHILOSOPHY OF LONG-TERM STORAGE COVERING SOLIDIFICATION, AND FOR THE TREATMENT OF KRYPTON-85 AND TRITIUM ARISING FROM FUEL REPROCESSING IN THE PNC PLANT. R & D WORKS ON SOLIDIFICATION OF HALW COMBINED WITH LONG-TERM STORAGE OF SOLIDIFIED PRODUCT AND ON KRYPTON RECOVERY ARE GOING TO START IN THE NEAR FUTURE. PROVISIONAL APPROACHES OF THE ABOVE R & D ARE ALSO PRESENTED.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*KRYPTON + *WASTE STORAGE + *WASTE TREATMENT, LIQUID + WASTE TREATMENT, GAS + *WASTE TREATMENT, SOLID + HIGH RADIATION + *WASTE MANAGEMENT + JAPAN + *FUEL REPROCESSING + R AND D PROGRAM + SOLID

074877
BRYANT PM + JONES JA
THE FUTURE IMPLICATIONS OF SOME LONG-LIVED FISSION PRODUCT NUCLIDES DISCHARGED TO THE ENVIRONMENT IN FUEL REPROCESSING WASTES
NATIONAL RADIOLOGICAL PROTECTION BOARD, HARWELL, ENGLAND
CONF-721107 +. 19 PAGES, 5 FIGURES, PAPER PRESENTED AT THE SYMPOSIUM ON THE MANAGEMENT OF RADIOACTIVE WASTES FROM FUEL REPROCESSING, HELD IN PARIS, NOVEMBER 27-DECEMBER 1, 1972

CURRENT REPROCESSING PRACTICE LEADS TO THE DISCHARGE TO THE ENVIRONMENT OF VIRTUALLY ALL THE KRYPTON-85 AND TRITIUM, AND A LARGE FRACTION OF THE IODINE-129, FORMED AS FISSION PRODUCTS IN REACTOR FUEL. AS NUCLEAR POWER PROGRAMMES EXPAND THE GLOBAL INVENTORY OF THESE LONG-LIVED NUCLIDES IS INCREASING. THE RADIOLOGICAL SIGNIFICANCE OF THESE DISCHARGES IS ASSESSED IN TERMS OF RADIATION EXPOSURE OF VARIOUS POPULATION GROUPS DURING THE NEXT FEW DECADES. THE RESULTS OF THIS ASSESSMENT SHOW THAT KRYPTON-85 WILL GIVE HIGHER DOSE-RATES THAN TRITIUM OR IODINE-129, BUT THAT ON CONVENTIONAL RADIOLOGICAL PROTECTION CRITERIA THESE DO NOT JUSTIFY TAKING ACTION TO REMOVE KRYPTON-85 FROM REPROCESSING PLANT EFFLUENTS BEFORE THE 21ST CENTURY.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

DECONTAMINATION + *EFFLUENT + *IODINE + *KRYPTON + *WASTE DISPOSAL + POPULATION EXPOSURE + *WASTE MANAGEMENT + RADIOLOGICAL ASSISTANCE + SAFETY EVALUATION + *FUEL REPROCESSING + FORECAST + *DISCHARGE

074881
VYGEN H + MERZ E + LASER M, ET AL.
OFF-GAS TREATMENT AND KRYPTON DISPOSAL IN HTGR-FUEL ELEMENT REPROCESSING
KERNFORSCHUNGSANLAGE, INSTITUT FUR CHEMISCHE TECHNOLOGIE, JULICH, GERMANY
CONF-721107 +. 19 PAGES, 5 TABLES, PAPER PRESENTED AT THE SYMPOSIUM ON THE MANAGEMENT OF RADIOACTIVE WASTES FROM FUEL REPROCESSING, HELD IN PARIS, NOVEMBER 27-DECEMBER 1, 1972

KRYPTON, TRITIUM, AND IODINE ARE SEPARATED FROM BURNER OFF-GAS BY CO2-LIQUIFICATION AND RECTIFICATION AT ROOM TEMPERATURE. KRYPTON IS CONCENTRATED IN THE LOWER BOILING FRACTION, WHILE TRITIUM AND IODINE ARE CONCENTRATED IN THE HIGHER BOILING FRACTION (AKUT-PROCESS). THE DISSOLVER OFF-GAS IS DECONTAMINATED BY A CRYOGENIC PROCESS. BASED ON SAFETY AND ECONOMY, THE DISPOSAL OF COMPRESSED KRYPTON CONFINED IN STEEL CYLINDERS BY DUMPING IN THE DEEP SEA IS PREFERRED TO THE LONG TERM OVERGROUND BUNKER STORAGE.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

IODINE + *KRYPTON + *WASTE DISPOSAL + *WASTE DISPOSAL, OCEAN + *WASTE TREATMENT + WASTE TREATMENT, ECONOMICS + *OFF GAS + SAFETY EVALUATION

074887
KRAUSE H + HILD W + SAUER K
DEEP-WELL DISPOSAL OF TRITIUM CONTAINING LIQUID EFFLUENTS
GESELLSCHAFT FUR KERNFORSCHUNG, KARLSRUHE
CONF-721107 +. 25 PAGES, 8 FIGURES, PAPER PRESENTED AT THE SYMPOSIUM ON THE MANAGEMENT OF RADIOACTIVE WASTES FROM FUEL REPROCESSING, HELD IN PARIS, NOVEMBER 27-DECEMBER 1, 1972

AT THE KARLSRUHE NUCLEAR RESEARCH CENTER DEEP-WELL INJECTION OF TRITIUM-CONTAINING EFFLUENTS INTO ISOLATED DEPLETED OIL HORIZONS OF THE DEEP UNDERGROUND IS BEING STUDIED AS AN APPROACH OF TRITIUM

074887 *CONTINUED*
DISPOSAL, WHICH DOES NOT LEAD TO A POLLUTION OF THE BIOSPHERE. THE GEOLOGY OF THE OIL FIELD IN THE VICINITY OF THE CENTER, THE TECHNICAL UNDERGROUND AND SURFACE ADAPTATIONS OF THE SELECTED WELL, THE CONTROL AND SURVEILLANCE PROVISIONS ARE DESCRIBED TOGETHER WITH THE ESSENTIAL SAFETY CONSIDERATIONS AND THE ANTICIPATED OPERATION CONDITIONS.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

CONTAINMENT, UNDERGROUND + *EFFLUENT + GEOLOGY + SITING, WASTE DISPOSAL + *WASTE MANAGEMENT + GERMANY + SAFETY EVALUATION + *FUEL REPROCESSING + GAS + LIQUID + *WASTE DISPOSAL, DEEP WELL

074952
HOLLIDAY JH
REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT
GENERAL ELECTRIC COMPANY, ST. PETERSBURG, FLORIDA
CONF-721030 +. 10 PAGES, 1 FIGURE, PP. 393-402, PAPER PRESENTED AT THE AEC POLLUTION CONTROL CONFERENCE, HELD IN OAK RIDGE, TENN. ON OCTOBER 25, 1972

REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENT AT THE PINELLAS PLANT IS ATTRIBUTED TO A PROCEDURE CHANGE AND THE OPERATION OF A HYDROGEN OXIDIZING-COLLECTION SYSTEM. THE OXIDIZING-COLLECTION SYSTEM IN USE AT PINELLAS IS DESCRIBED. IT IS SUGGESTED THAT SUCH A SYSTEM, PROPERLY DESIGNED, COULD EFFECT SIMILAR REDUCTIONS AT OTHER LOCATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT + *WASTE TREATMENT + STACK + *WASTE MANAGEMENT

075295
BARRY PJ + MARKO AM + OPHEL IL + WILSON R
SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA
CHALK RIVER NUCLEAR LABORATORIES, ONTARIO
AECL-4165 +. 82 PAGES, 3 FIGURES, 14 TABLES, 22 REFERENCES, APRIL 1972

EIGHT PAPERS AND TALKS ARE INCLUDED, SOME OF WHICH WERE PUBLISHED PREVIOUSLY. TOPICS INCLUDE NUCLEAR WASTES, BIOLOGICAL UPTAKE, DOSE LIMITS, AND AMOUNTS OF RADIOACTIVITY RELEASED FROM 3 REACTORS DURING 1967-1971. THE CLOSED CYCLES USED TO REDUCE HEAVY-WATER LOSSES REDUCE ESCAPE OF GASEOUS RADIOISOTOPES. MOLECULAR SIEVE DRIERS REMOVE BOTH HEAVY WATER AND TRITIATED WATER, AND PROVIDE DELAY IN THE RELEASE OF NOBLE-GAS RADIOISOTOPES. WHETHER IODINE IS RETAINED IS NOT YET KNOWN.

CANADA + DOSE + IODINE + MOLECULAR SIEVE + NOBLE GAS + RELEASE RATE + *WASTE TREATMENT + CRITICAL NUCLIDE PATHWAY + ENVIRONMENT + *CONTAINMENT LEAKAGE CONTROL + THERMAL POLLUTION + ABSORPTION + *RADIONUCLIDE UPTAKE + FOOD CHAIN + DRY

075565
NEBEKER RL + LAKEY LT
LIQUID WASTE MANAGEMENT AT THE NRTS TEST REACTOR AREA
IDAHO NUCLEAR CORPORATION + ALLIED CHEMICAL CORPORATION
8 PAGES, 4 FIGURES, 5 TABLES, 5 REFERENCES, NUCLEAR ENGINEERING, 68(123), PP. 10-17 (1972)

DESCRIBES RADIOACTIVE-WASTE-DISPOSAL PRACTICES AT THE NATIONAL REACTOR TESTING STATION'S TEST REACTOR AREA. PROBLEMS ENCOUNTERED IN THE OPERATION OF THE WASTE SYSTEM ARE DISCUSSED. SOLUTIONS TO THESE PROBLEMS AND PROPOSED CHANGES IN THE EXISTING SYSTEM ARE DISCUSSED ALSO.

CESIUM + COBALT + *NRTS + STRONTIUM + *WASTE TREATMENT + GROUND WATER, NUCLIDE OCCURRENCE + *WASTE DISPOSAL, LIQUID + *WASTE MANAGEMENT + RADIOACTIVITY RELEASE + REACTOR TEST FACILITY + *MONITOR, AREA + OPERATING EXPERIENCE + CONCENTRATION

075576
SMEETS JGPM + BERLIN A + AMAVIS RJ
SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT
COMMISSION OF THE EUROPEAN COMMUNITIES, LUXEMBOURG (BELGIUM)
12 PAGES, 1 TABLE, NUCLEAR SAFETY, 13(5), PP. 380-391 (SEPTEMBER/OCTOBER 1972)

THE SYMPOSIA PAPERS (SEPARATE ABSTRACTS APPEAR IN NSIC ABSTRACTS FOR MOST) ARE LISTED AND CHARACTERIZED BRIEFLY. SOME OF THE QUESTIONS RAISED AT A 2.5-HOUR PANEL DISCUSSION ARE PRESENTED - EFFECTS FROM TRITIUM PRODUCED BY FAST REACTORS, ACCOUNTING FOR PARAMETERS WHICH AFFECT RADIONUCLIDE UPTAKE, THE TERM 'LIMITING RADIOLOGICAL CAPACITY' INCLUDES NO SAFETY FACTORS, THE TERM 'CRITICAL POPULATION' DOES NOT ACCOUNT FOR MULTIPLE SOURCES AND EFFECTS FROM OTHER POLLUTANTS, AND EXTENSION OF THE EURATOM TREATY TO NONRADIOACTIVE POLLUTANTS. ANSWERS TO MANY OF THESE QUESTIONS REQUIRE FURTHER WORK IN 'RADIOLOGICAL FORECASTING' FOR A HYDROLOGICAL BASIN, ALSO IN ANALYSIS OF HAZARDS IN CONNECTION WITH BOTH RADIOACTIVE WASTE DISPOSAL AND ENVIRONMENTAL CONTAMINATION BY TRITIUM AND THE NOBLE-GAS RADIONUCLIDES.

ECOLOGY + EURATOM + NOBLE GAS + ATMOSPHERIC POLLUTION + WASTE DISPOSAL + *CRITICAL NUCLIDE PATHWAY + *ENVIRONMENT + WATER POLLUTION + FORECAST + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + *FOOD CHAIN + POLLUTION + ECOSYSTEM, MARINE + ECOSYSTEM, MODEL + SYSTEM ANALYSIS + MODEL, DETERMINISTIC + ECOSYSTEM, ESTUARINE + ORGANIZATION, INTERNATIONAL

075626
HOGG RM
WASTE MANAGEMENT
BABCOCK AND WILCOX
ORP/SID-72-4 +. 21 PAGES, PP. 66-86 OF THE SOUTHERN CONFERENCE ON ENVIRONMENTAL RADIATION PROTECTION FROM NUCLEAR POWER PLANTS, APRIL 21-22, 1971

DEALS WITH WASTE MANAGEMENT IN A LIGHT-WATER REACTOR AND DESCRIBES NEW EQUIPMENT DESIGNED TO FURTHER REDUCE THE ALREADY LOW WASTE DISCHARGE FROM A NUCLEAR STEAM SYSTEM.

AVAILABILITY - U. S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, WASHINGTON, D. C. 20460

DILUTION + EFFLUENT + KRYPTON + MPC + SOURCE, RADIATION + *WASTE DISPOSAL + WASTE STORAGE + XENON + *REACTOR, POWER + STACK + *REGULATION, AEC + WASTE TRANSPORTATION + *WASTE MANAGEMENT + STORAGE CONTAINER + RADIOACTIVITY RELEASE + LIQUID + *OPERATING EXPERIENCE + DISCHARGE

076844
LEE JY + WILSON RL
DRY SITE RADWASTE SYSTEM DESIGN
SACRAMENTO MUNICIPAL UTILITY DISTRICT
1 PAGE, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 15(1), P. 321, FROM THE 1972 ANNUAL MEETING HELD AT LAS VEGAS, NEVADA, JUNE 18-22, 1972

THE LIQUID RADIOACTIVE WASTE TREATMENT AT THIS SITE CONSISTS OF A REACTOR-COOLANT RADWASTE SYSTEM AND A MISCELLANEOUS LIQUID RADWASTE SYSTEM. THE RADWASTE TREATMENT OF EACH SYSTEM INCLUDES FILTRATION DEMINERALIZATION, DEGASSIFICATION, AND EVAPORATION. THE UNIQUE ASPECT OF THE RANCHO SECO DESIGN IS THAT THE DISTILLATE PRODUCED FROM BOTH SYSTEMS IS RECYCLED FOR PLANT USE. THE CONCENTRATED BORIC ACID FROM THE BORIC ACID EVAPORATOR IS ALSO RECYCLED FOR PLANT USE. THE BOTTOMS FROM THE MISCELLANEOUS WASTE EVAPORATOR ARE PREPARED FOR OFF-SITE DISPOSAL BY AN AEC-LICENSED DISPOSAL CONTRACTOR. A MAJOR CONCERN THAT ARISES IN CONSIDERING A CLOSED-CYCLE DESIGN SUCH AS THIS IS THERE ARE POTENTIAL PROBLEMS DUE TO TRITIUM BUILDUP IN THE PRIMARY SYSTEM, PROCESSING THE WASTES GENERATED DUE TO A STEAM-GENERATOR TUBE LEAK.

AVAILABILITY - ROBERT L. WILSON, SACRAMENTO MUNICIPAL UTILITY DISTRICT, 6201 S. ST., SACRAMENTO, CALIFORNIA 95813

WASTE DISPOSAL + *WASTE DISPOSAL, LIQUID + TUBING + LEAK + *RANCHO SECO (PWR)

077136
MARTIN JA
GENERAL ENVIRONMENTAL DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT
U.S. ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON
PAPER NO. 29 +. PAPER PRESENTED AT THE 18TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, HELD IN MIAMI BEACH, FLORIDA, JUNE 17, 1973 (SEE CONF-730603--)

EFFLUENT AND ENVIRONMENTAL RADIONUCLIDE DATA PERTINENT TO THE OPERATIONS OF A NUCLEAR FUEL REPROCESSING PLANT WERE ANALYZED AND DOSES AND POPULATION DOSES TO SAMPLE POPULATIONS WERE CALCULATED. THE SIGNIFICANT RADIONUCLIDES CONSIDERED WERE KRYPTON-85, TRITIUM, IODINE-129, CESIUM-134, STRONTIUM-89, RUTHENIUM/RHODIUM-106, AND COBALT-60. DIRECT RADIATION, SUBMERSION, INHALATION, AND INGESTION IMPACT MODES WERE CONSIDERED. PATHWAYS INCLUDED: AIR, WATER, MILK, FISH AND DEER. DOSES (REMS) FOR THE AVERAGE OF THE MAXIMALLY EXPOSED POPULATION GROUPS WERE CALCULATED.

AVAILABILITY - JAMES A. MARTIN, U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, WASHINGTON, D.C. 20460

CESIUM + COBALT + *EFFLUENT + INGESTION + INHALATION + IODINE + KRYPTON + *MEASUREMENT + RUTHENIUM + STRONTIUM + WATER + AIR + MILK + *POPULATION EXPOSURE + CRITICAL NUCLIDE PATHWAY + *DOSE CALCULATION, EXTERNAL + RHODIUM + *FUEL REPROCESSING + ANIMAL, FISH + CONCENTRATION + RADIATION EXPOSURE + MAMMAL, LARGE + HPIS

077193
CROWSON DL
MAN-MADE TRITIUM
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
5 PAGES, PP. 23-27 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

THE TOPIC OF MAN-MADE TRITIUM DIVIDES ITSELF INTO SEVERAL SUBTOPICS. THESE INCLUDE THE MECHANISMS FOR THE PRODUCTION OF MAN-MADE TRITIUM, THE EXTENT OF THIS PRODUCTION AS COMPARED TO NATURAL MEANS OF PRODUCTION, PREDICTIONS OF THE RATE OF TRITIUM GENERATION BY HUMAN ACTIVITIES IN YEARS TO COME, SOME PROBLEMS CONCERNING THE MANAGEMENT OF MAN-MADE TRITIUM, AND SOME CONCLUSIONS AS TO MEASUREMENTS FOR REDUCTION OF TRITIUM IN THE ENVIRONMENT.

FISSION PRODUCT RELEASE + *MONITOR, ENVIRONMENTAL + *WASTE MANAGEMENT + RADIATION SAFETY AND CONTROL + RADIOACTIVITY RELEASE + SAFETY EVALUATION + *FORECAST + *PRODUCTION + *CONCENTRATION + HPIS

079774
RICHTER D + ANDERS G + SCHULZE H
DISPOSAL OF RADIOACTIVE GASES FROM NUCLEAR INSTALLATIONS

079774 *CONTINUED*
10 PAGES, KERNENERGIE, 15(9), PP. 293-302 (SEPTEMBER 1972)

REMOVAL OF RADIONUCLIDES OF I, XE, AND KR FROM OFF-GASES OF NUCLEAR INSTALLATIONS BY RETENTION, SEPARATION, AND STORAGE IS OF GREAT INTEREST IN VIEW OF THE INCREASING EXPANSION OF NUCLEAR ENERGY, FOR THE REDUCTION OF DISCHARGES OF RADIOACTIVE SUBSTANCES INTO THE ATMOSPHERE AND THEREBY FOR THE IMPROVEMENT OF ENVIRONMENTAL PROTECTION. A REVIEW OF THE PROBLEM AND THE STATE OF DEVELOPMENT OF POSSIBLE METHODS OF SEPARATION OF I, XE, AND KR FROM THE OFF-GAS OF NUCLEAR POWER PLANTS AND REPROCESSING PLANTS AS WELL AS THE REMOVAL OF GASES IN GEOLOGICAL STRUCTURES IS GIVEN, WHICH LEADS TO THE CONCLUSION THAT THE TECHNICAL POSSIBILITIES FOR PROTECTION OF THE ENVIRONMENT IN THIS AREA WILL BE PRODUCED IN THE FUTURE OR WILL BE EASILY CAPABLE OF DEVELOPMENT. (IN GERMAN)

ADSORPTION + GEOLOGY + *IODINE + *KRYPTON + WASTE DISPOSAL + WASTE STORAGE + *XENON + AIR + REACTOR + *OFF GAS + RECOVERY PROCESS + FUEL REPROCESSING + *INDUSTRY, NUCLEAR + POWER PLANT, NUCLEAR

080208
MARTIN JA
CALCULATIONS OF ENVIRONMENTAL RADIATION EXPOSURES AND POPULATION DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT
U.S. ENVIRONMENTAL PROTECTION AGENCY
16 PAGES, 12 TABLES, 6 FIGURES, 33 REFERENCES, RADIATION DATA AND REPORTS, 14(2), PP. 59-76 (FEBRUARY 1973)

EFFLUENT AND ENVIRONMENTAL DATA PERTINENT TO THE NUCLEAR FUEL SERVICES NUCLEAR FUEL REPROCESSING PLANT IN WEST VALLEY, N.Y., WERE ANALYZED TO DETERMINE DOSES TO SAMPLE POPULATIONS. INDIVIDUAL DOSES TO THE MAXIMALLY EXPOSED POPULATION GROUP WERE CONSIDERED. POPULATION DOSES (MAN-REMS) FROM AIR, FISH, DEER, AND WATER PATHWAYS WERE CALCULATED. THE MOST SIGNIFICANT RADIONUCLIDES CONTRIBUTING TO DOSES WERE TRITIUM, KRYPTON-85, STRONTIUM-90, CESIUM-134 AND CESIUM-137. IT WAS CONCLUDED THAT THE IMPACT OF THIS FACILITY UPON HUMANS WAS WELL BELOW APPLICABLE GUIDES IN 1971.

CESIUM + *EFFLUENT + IODINE + KRYPTON + STRONTIUM + ATMOSPHERIC POLLUTION + WATER + AIR + *POPULATION EXPOSURE + *CRITICAL NUCLIDE PATHWAY + *DOSE CALCULATION, EXTERNAL + WATER POLLUTION + *FUEL REPROCESSING + ANIMAL, FISH + CONCENTRATION + *FOOD CHAIN + MAMMAL, LARGE + FUEL, NUCLEAR

080812
ARNOLD WD + SALMON R + LIN KH, ET AL.
PRELIMINARY EVALUATION OF METHODS FOR THE DISPOSAL OF TRITIATED WATER FROM NUCLEARLY STIMULATED NATURAL GAS WELLS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4024 +. 52 PAGES, FIGURES, TABLES, APRIL 1973

LARGE VOLUMES OF SLIGHTLY TRITIATED WATER WILL BE PRODUCED FROM NATURAL GAS FIELDS DEVELOPED VIA NUCLEAR STIMULATION. EVALUATIONS BASED ON FEASIBILITY, SAFETY, AND COST INDICATE THAT INJECTION INTO DEEP WELLS, EVAPORATION INTO STACKS, AND EVAPORATION FROM PONDS ARE THE BEST DISPOSAL METHODS. AT THIS POINT, NONE OF THE THREE IS CLEARLY SUPERIOR TO THE OTHERS. EACH HAS POTENTIAL ADVANTAGES AND DISADVANTAGES THAT CAN BEST BE EVALUATED IN ACTURAL TESTS. THESE DISPOSAL TESTS CAN BE MADE IN CONJUNCTION WITH THE PRODUCTION TESTING OF THE FIRST RIO BLANCO WELL. WHILE NO UNFAVORABLE ENVIRONMENTAL EFFECTS WOULD BE EXPECTED FROM THE TESTS, THEY CAN BE MONITORED TO ENSURE THAT THIS IS THE CASE AND CAN BE TERMINATED IF NECESSARY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + ECONOMICS + PLOWSHARE + *WASTE DISPOSAL + WASTE STORAGE + STACK + WASTE TRANSPORTATION + EVAPORATION + *GAS + *WASTE DISPOSAL, DEEP WELL + *STIMULATION + RESOURCE, NATURAL

081106
HECKMAN RA + COWLES JO
REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL FORMATIONS
U.S. PATENT 3,703,208 +. NOVEMBER 21, 1972

THIS PATENT RELATES TO OXIDIZING AGENTS WHICH ARE DISPOSED CIRCUMJACENT TO A NUCLEAR DEVICE DETONATED IN A GEOLOGICAL FORMATION, GENERALLY A CARBONACEOUS OR PETROLIFEROUS FORMATION, TO PROVIDE A MORE OXIDIZING ENVIRONMENT THEREABOUT. UPON DETONATION OF THE DEVICE REDUCTANTS PRESENT IN THE FORMATION AS WELL AS IN EMPLACEMENT COMPONENTS ARE OXIDIZED. CONSEQUENTLY TRITIUM PRODUCED BY THE DETONATION TOGETHER WITH ANY HYDROGEN GAS PRESENT TENDS TO BE OXIDIZED TO FORM A TRITIATED WATER PRODUCT. THE WATER COMBINES WITH INORGANIC MATERIALS IN THE VICINITY OF THE DETONATION AND IS IMMOBILIZED OR FALLS TO THE BOTTOM OF THE DETONATION PRODUCED CAVITY SO AS TO MINIMIZE THE TRITIUM CONTENT OF ORGANIC MATERIALS EVOLVED BY THE FORMATION.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPARTMENT OF COMMERCE, WASHINGTON, D.C. (25 CENTS/COPY)

OXIDATION + *WASTE TREATMENT + *NUCLEAR DETONATION + WASTE MANAGEMENT + UNITED STATES + PATENT

082225
MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY
U.S. ATOMIC ENERGY COMMISSION, TECHNICAL INFORMATION CENTER
TID-3337 +. 100 PAGES, MAY 1973

A SELECTED BIBLIOGRAPHY OF 351 REFERENCES ON TRITIUM. THE REFERENCES WERE RETRIEVED FROM NSA DATA BASE BY COMPUTER SEARCH AND INDEXING. REFERENCES ARE ARRANGED IN A SOMEWHAT CHRONOLOGICAL ORDER.

082225 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIBLIOGRAPHY + *WASTE DISPOSAL + MONITOR + RADIATION SAFETY AND CONTROL

082301
OSTLUND HG
CERTAIN ENVIRONMENTAL ASPECTS OF TRITIUM
UNIVERSITY OF MIAMI, FLORIDA
113 PAGES, PP. 382-495 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

REPORTS ON TOPICS SUCH AS ENVIRONMENTAL TRITIUM, TRITIUM IN THE ATMOSPHERE AND OCEAN, ITS RADIOLOGICAL HAZARD IN CERTAIN CORROSION PROCESSES, GUIDE FOR LIMITING ITS RELEASE, MOVEMENT IN ECOLOGICAL SYSTEM, TRANSFER FROM METHANE TO VEGETATION, BEHAVIOR IN THE SOIL INCLUDING FORCED EXCHANGE WITH CLAYS AND A DYNAMIC MODEL OF WATER MOVEMENT IN SOIL UNDER VARIOUS CLIMATOLOGICAL.

DOSE + GUIDE + *OCEAN AND SEA + REGULATION + *ATMOSPHERIC POLLUTION + WATER + *POPULATION EXPOSURE + *HAZARDS ANALYSIS + ION EXCHANGE + MINERAL EXCHANGE + SOIL + RADIOACTIVITY RELEASE + *ENVIRONMENT + WATER VAPOR + GAS + MODEL + BEHAVIOR + VEGETATION + CONCENTRATION + FOOD CHAIN + ECOSYSTEM + TRANSPORT + MAN + VAPOR EXCHANGE + HPIS

082317
EISENBUD M
FUEL REPROCESSING
NEW YORK UNIVERSITY MEDICAL CENTER, NEW YORK
8 PAGES, PP. 290-298 OF 'ENVIRONMENTAL RADIOACTIVITY', PUBLISHED BY ACADEMIC PRESS, INC., 1973 (BOOK)

WHEN A REACTOR CORE HAS REACHED THE END OF ITS USEFUL LIFE, ONLY A SMALL PERCENTAGE OF THE 235U WILL HAVE BEEN TRANSMUTED TO 239PU AND OTHER TRANSURANIC ELEMENTS. THE CORE WITH ITS INVENTORY OF FISSION PRODUCES AND LONG-LIVED ALPHA-EMITTING HEAVY RADIOELEMENTS IS THEN REMOVED FROM THE REACTOR STORED UNDER WATER IN THE FUEL STORAGE POOLS ASSOCIATED WITH THE REACTOR, AND THEN TRANSPORTED TO A FUEL-REPROCESSING PLANT IN WHICH THE SPENT FUEL IS CHEMICALLY TREATED TO: (1) CONVERT THE FISSION PRODUCTS INTO A FORM SUITABLE FOR LONG-TERM STORAGE; AND (2) RECOVER THE REMAINING 235U AND THE TRANSURANIC ELEMENTS.

CESIUM + DOSE + FISSION PRODUCT RELEASE + FUEL HANDLING + KRYPTON + ALPHA EMITTER + *PLUTONIUM + FUEL STORAGE + STRONTIUM + *URANIUM + AIR + WATER, DRINKING + *POPULATION EXPOSURE + *PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + TRANSURANIUM ELEMENT + *FUEL REPROCESSING + CONCENTRATION + *RADIATION EXPOSURE + MAN + FOOD + HPIS + FUEL ELEMENTS

082318
MANAGEMENT OF RADIOACTIVE WASTES
NEW YORK UNIVERSITY MEDICAL CENTER, NEW YORK
16 PAGES, PP. 299-315 OF 'ENVIRONMENTAL RADIOACTIVITY,' PUBLISHED BY ACADEMIC PRESS, INC., 1973 (BOOK)

DISCUSSES THE MORE GENERAL IMPLICATIONS OF RADIOACTIVE WASTE DISPOSAL AND IN PARTICULAR AN ATTEMPT IS MADE TO APPRAISE THE TOTAL MAGNITUDE OF THE WASTE-DISPOSAL PROBLEM NOW AND IN THE FUTURE. GIVES DETAILS ON LOW-LEVEL AND HIGH-LEVEL WASTE MANAGEMENT. DISCUSSES THE SPECIAL PROBLEMS OF TRITIUM AND KRYPTON-85 DISPOSAL.

DECAY HEAT + *KRYPTON + *WASTE DISPOSAL, OCEAN + *WASTE DISPOSAL, TERRESTRIAL + WASTE STORAGE + *WASTE TREATMENT + CALCINATION + *WASTE MANAGEMENT + STORAGE CONTAINER + *WASTE DISPOSAL, SALT + ENERGY LEVEL + FUEL REPROCESSING + FORECAST + HPIS + WASTE SOLIDIFICATION

082903
HAKONSON TE + NYHAN JW + JOHNSON LJ
ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31, 1972
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5282-MS +. 47 PAGES, 17 TABLES, 17 FIGURES, 56 REFERENCES, MAY 1973

LIQUID-WASTE-DISPOSAL-AREA HISTORY IS SUMMARIZED, INCLUDING ACCUMULATIVE PU. MOST BIOTA HAD TRITIUM LESS THAN THE EFFLUENT WATER; HOWEVER HONEYBEES HAD AS MUCH AS TWO ORDERS OF MAGNITUDE HIGHER LEVELS, APPARENTLY FROM THE FORAGING OF THE BEES ON CLOVER GROWING NEAR DISPOSAL PITS. THERE WAS ALSO EVIDENCE OF UPTAKE OF CS-137 AND PU BY BIOTA IN AN AREA WITHIN ABOUT 2500 METERS OF THE WASTE OUTFALLS; HOWEVER MOST CS-137 REMAINED IN STREAM CHANNEL ALLUVIUM. THE ROLE OF EFFLUENT PH IN MEDIATING CS-137 AND PU TRANSPORT WILL BE STUDIED. RADIONUCLIDES ARE BEING DETERMINED IN SOILS AND BIOTA IN THE VICINITY OF THE 1945 TRINITY SHOT NEAR ALAMAGORDO, NEW MEXICO.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + EFFLUENT + PLUTONIUM + SURVEY, ENVIRONMENT + *WASTE DISPOSAL, TERRESTRIAL + NUCLEAR DETONATION + *LASL + CRITICAL NUCLIDE PATHWAY + *RADIONUCLIDE UPTAKE + VEGETATION + FIELD EXPERIMENT + INSECT + EFFECT, PH + MAMMAL, RODENT

083190
PURTYMUN WD
UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE SHAFTS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5286-MS +. 7 PAGES, 4 TABLES, 4 FIGURES, MAY 1973

TRITIUM FROM CONTAMINATED WASTES PLACED IN STORAGE SHAFTS HAS BEEN TRANSPORTED BY MOISTURE INTO THE ADJACENT TUFF. A STUDY MADE TO DETERMINE THE EXTENT AND GEOLOGIC FACTORS GOVERNING THIS MOVEMENT INDICATES THAT 100 PCI/ML LEVELS HAVE MOVED WESTWARD A DISTANCE OF 105 FT IN 4 YR. MAJOR MOVEMENT HAS BEEN ALONG THE CONTACT BETWEEN THE TWO ASHFLOWS PENETRATED BY THE SHAFTS, WITH SECONDARY TRANSPORT THROUGH OPEN JOINTS AND THROUGH THE TUFF MATRIX. EVAPORATION FROM SURFACE SOIL AND TUFF AND TRANSPIRATION FROM PLANTS HAS BEEN A CONTRIBUTING FACTOR IN THE RELEASE OF TRITIUM TO THE ATMOSPHERE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GEOLOGY + *SURFACE CONTAMINATION + *ATMOSPHERIC POLLUTION + WASTE STORAGE + *SOIL, NUCLIDE OCCURRENCE + EVAPORATION + RADIOACTIVITY RELEASE + *WATER VAPOR + ROCK MECHANICS + *TRANSPORT + *TRANSPIRATION

083395
DUBE CM + COFFIN DO + STOLL RO
AN APPARATUS FOR THE REDUCTION OF TRITIUM EMISSIONS INTO THE ATMOSPHERE
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5303 +. 4 PAGES, 7 FIGURES, JUNE 1973

CONVERSION OF TRITIUM TO TRITIATED WATER AND ABSORPTION ON A MOLECULAR SIEVE REDUCED THE TRITIUM CONTENT MORE THAN 250,000-FOLD FOR GASEOUS EFFLUENTS CONTAINING 0.5% TRITIUM. GAS TO BE TREATED WAS PUMPED INTO A HOLDING TANK AT ABOUT 15 PSIG. AN AUTOMATIC PROGRAMMER REGULATED THE TREATMENT. AS A SAFETY FEATURE, THE SYSTEM IS DESIGNED TO SHUT DOWN IN THE EVENT OF POWER FAILURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + EFFLUENT + *ATMOSPHERIC POLLUTION + *WASTE TREATMENT, GAS + *PLANT PROTECTIVE SYSTEM + WATER VAPOR + ABSORPTION

086883
NORTH ED + BOOTH RL
FISSION PRODUCT GAS RETENTION STUDY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4409 +. 119 PAGES, 11 TABLES, 18 FIGURES, AUGUST 1973

VARIOUS PROCESSES HAVE BEEN EVALUATED WHICH WOULD PROVIDE IMPROVED PLANT CONTAINMENT FACTORS OF 100 FOR TRITIUM AND 10,000 FOR IODINE AT A REPROCESSING PLANT FOR LIGHT WATER REACTOR FUELS. THE GOALS FOR KRYPTON AND IODINE CAN BE OBTAINED ALTHOUGH A FACTOR OF 1,000 FOR IODINE APPEARS TO BE MORE PRACTICAL. THE GOAL FOR TRITIUM MUST AWAIT FURTHER DEVELOPMENT OF THE VOLOXIDATION PROCESS OR OF ALTERNATIVE METHODS. THE COST OF PROVIDING IMPROVED CONTAINMENT FOR THESE ISOTOPES AT THE WEST VALLEY REPROCESSING PLANT IS ESTIMATED TO BE $16,900,000; OF WHICH $10,000,000 IS FOR RECOVERY OF TRITIUM, $4,000,000 FOR RECOVERY OF KRYPTON, AND $2,900,000 IS FOR RECOVERY OF IODINE. IMPROVED CONTAINMENT OF IODINE SHOULD BE PROVIDED AT EXISTING AND FUTURE PROCESSING PLANTS.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

CONTAINMENT, FUEL REPROCESSING + ECONOMICS + FISSION PRODUCT, IODINE + KRYPTON + ORNL + MODIFICATION + *FISSION PRODUCT RETENTION + REVIEW + *NFS + *FUEL REPROCESSING + JACOBS

087422
LASER M + BEAUJEAN H + VYGEN H
AKUT - A PROCESS FOR SEPARATING AEROSOLS, KRYPTON AND TRITIUM FROM THE COMBUSTION WASTE GASES IN THE REPROCESSING OF HIGH TEMPERATURE FUEL ELEMENTS
KERNFORSCHUNGSANLAGE JULICH GMBH
GERHTR-60 +. 5 PAGES, 2 TABLES, 1973

DESCRIBES THE METHOD WHICH WAS SUCCESSFULLY TESTED UNDER LABORATORY CONDITIONS. EXPERIMENTAL RESULTS ARE GIVEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + KRYPTON + *WASTE TREATMENT, GAS + GERMANY + *FISSION PRODUCT RETENTION + FUEL REPROCESSING + JACOBS

089425
MUSGRAVE BC
TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES
ALLIED CHEMICAL, NATIONAL REACTOR TESTING STATION
ICP-1041 +. 19 PAGES, 3 TABLES, 4 FIGURES, 8 REFERENCES, JANUARY 1974

TRITIUM WHICH IS PRODUCED FROM TERNARY FISSION IN NUCLEAR REACTORS WILL BE DILUTED AND DISPERSED

089425 *CONTINUED*
THROUGHOUT THE AQUEOUS STREAMS IN THE FUEL REPROCESSING PLANTS. THE RANGES OF TRITIUM CONCENTRATIONS EXPECTED IN THE REPROCESSING PLANT STREAMS FOR DIFFERENT REACTOR TYPES ARE EXAMINED. THE REQUIREMENTS FOR TRITIUM CONTROL THROUGH RECYCLE AND ISOTOPE SEPARATION ARE DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT + FISSION GAS RELEASE + REACTOR, MOLTEN SALT + OCEAN AND SEA + SURFACE WATER + *WASTE DISPOSAL + WASTE MANAGEMENT + REACTOR, LWR + FUEL REPROCESSING + REACTOR, HTGR + REACTOR, LMFBR + JACOBS

089576
BURGER LL + RYAN JL
THE TECHNOLOGY OF TRITIUM FIXATION AND STORAGE
BATTELLE PACIFIC NORTHWEST LABORATORIES
BNWL-1807 +. 34 PAGES, 54 REFERENCES, JANUARY 18, 1974

THE TECHNOLOGY OF FIXATION OF TRITIUM IN A SOLID FORM WAS EXAMINED. IT WAS CONCLUDED THAT THE BULK OF THE TRITIUM PRODUCED IN THE FUEL CYCLE ENDS UP IN THE FUELS PROCESSING PLANT, AND WITH CURRENT REPROCESSING PRACTICE, ENDS UP AS A VERY LARGE VOLUME OF LOW-LEVEL TRITIATED WATER. ALTERNATIVE PRACTICE MIGHT PRODUCE MUCH SMALLER VOLUMES. CRITERIA WERE ESABLISHED FOR NARROWING THE VERY WIDE POSSIBLE CHOICE OF TRITIUM FIXATION METHODS AND THE MERITS OF VARIOUS CLASSES OF TRITIUM COMPOUNDS ARE DISCUSSED. CURRENT TRITIUM FIXATION TECHNOLOGY AND FIXATION RESEARCH WAS REVIEWED. CLAYS, PORTLAND CEMENT, AND HYDRIDES ALL APPEAR TO HAVE MERIT, DEPENDING ON THE NATURE (PRINCIPALLY DEGREE OF DILUTION) OF THE TRITIUM WASTE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + *WASTE TREATMENT, FIXATION + *WASTE DISPOSAL, SOLID + WASTE MANAGEMENT + HYDRIDE + SOIL + JACOBS

090352
ENVIRONMENTAL RADIATION DOSE COMMITMENT: AN APPLICATION TO THE NUCLEAR POWER INDUSTRY
U.S. ENVIRONMENTAL PROTECTION AGENCY
EPA-520/4-73-002 +. 74 PAGES, FIGURES, REFERENCES, FEBRUARY 1974

THE CONCEPT OF ENVIRONMENTAL DOSE COMMITMENT IS DEVELOPED AND ILLUSTRATED BY APPLICATION TO PROJECTED RELEASES OF SELECTED RADIONUCLIDES FROM THE NUCLEAR POWER INDUSTRY OVER THE NEXT 50 YEARS. THE CONCEPT ENCOMPASSES THE TOTAL PROJECTED RADIATION DOSE TO POPULATIONS COMMITTED BY THE IRREVERSIBLE RELEASE OF LONG-LIVED RADIONUCLIDES TO THE ENVIRONMENT, AND FORMS A BASIS FOR ESTIMATING THE TOTAL POTENTIAL CONSEQUENCES ON PUBLIC HEALTH OF SUCH ENVIRONMENTAL RELEASES. BECAUSE OF THE DIFFICULTY OF MAKING PROJECTIONS OF RADIONUCLIDE TRANSPORT ON THE BASIS OF PRESENT KNOWLEDGE, THESE POTENTIAL CONSEQUENCES HAVE BEEN CALCULATED ONLY FOR THE FIRST 100-YR PERIOD FOLLOWING RELEASE. THE PARTICULAR RADIONUCLIDES CONSIDERED ARE TRITIUM, KRYPTON-85, IODINE-129, AND THE ACTINIDES.

AVAILABILITY - U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, CRITERIA AND STANDARDS DIVISION, WASHINGTON, D.C. 20460

IODINE + KRYPTON + SURVEY, RADIATION + *POPULATION EXPOSURE + *RADIOACTIVITY RELEASE + *ENVIRONMENT + ACTINIDE + GROWTH/DEVELOPMENT + RADIATION EXPOSURE + *INDUSTRY, NUCLEAR + JACOBS

091611
FABIAN H
TRITIUM ADSORPTION FACILITY
2 PAGES, 3 FIGURES, KERNTECHNIK, 16(2), PP. 63-64 (FEBRUARY 1974)

THIS PAPER DESCRIBES A FACILITY FOR THE TOTAL EXTRACTION OF TRITIUM FROM AIR AND WASTE GASES. THE FACILITY WORKS ON THE BASIS OF HYDROGEN OXIDATION. THE SYSTEM IS SO CONSTRUCTED THAT IT CAN BIND EQUALLY WELL TRITIUM CONTAMINATION IN THE FORM OF DUST, VAPOUR AND GAS. EXPERIMENTAL MEASUREMENTS HAVE SHOWN THAT TRITIUM CAN BE EXTRACTED FROM AIR DOWN TO A RESIDUAL CONCENTRATION OF 10-6 CI/M CUBED.

ADSORPTION + *WASTE TREATMENT, GAS + ADSORPTION, RADIOISOTOPE

092493
MURBACH EW + GRAY JH + CARR WH
FISSION PRODUCT GAS RETENTION PROCESS AND EQUIPMENT DESIGN STUDY
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4560 +. 59 PAGES, 8 FIGURES, 40 REFERENCES, MAY 1974

THE STATUS OF FISSION GAS RETENTION SYSTEMS OF POTENTIAL APPLICATION TO A FUEL REPROCESSING PLANT HAS BEEN REVIEWED. TWO PROCESSES CURRENTLY UNDER DEVELOPMENT AT OAK RIDGE NATIONAL LABORATORY AND THE OAK RIDGE GASEOUS DIFFUSION PLANT WERE EVALUATED TO DETERMINE THEIR APPLICABILITY TO THE BARNWELL NUCLEAR FUEL PLANT. THESE PROCESSES ARE FLUOROCARBON ABSORPTION FOR KRYPTON RECOVERY AND VOLOXIDATION FOR TRITIUM RECOVERY. FLOWSHEETS FOR ADAPTATION OF THESE PROCESSES TO THE BNFP WERE DEVELOPED AND COST ESTIMATES PREPARED FOR INSTALLATION OF THE FACILITIES. THE ESTIMATES WERE $5 X 10(EXP 6) FOR KRYPTON RECOVERY AND $34 X 10(EXP 6) FOR TRITIUM RECOVERY. THESE COSTS ARE EXCLUSIVE OF STORAGE CHARGES. NEITHER PROCESS IS SUFFICIENTLY DEVELOPED AT THIS TIME FOR COMMERCIAL REPROCESSING PLANT INSTALLATION.

092493 *CONTINUED*
AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FISSION PRODUCT, VOLATILE + KRYPTON + *OFF GAS + *FISSION PRODUCT RETENTION + FUEL REPROCESSING + JACOBS

092494
UNGER WE + MAILEN JC + IRVINE AR + WATSON CD
AQUEOUS FUEL REPROCESSING QUARTERLY REPORT FOR PERIOD ENDING DECEMBER 31, 1973
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-4488 +. 45 PAGES, TABLES, FIGURES, JUNE 1974

VOLOXIDATION OF IRRADIATED (U,PU)O2 FUEL IN A MINIATURE ROTARY VOLOXIDIZER REMOVED UP TO 99.5% OF THE TRITIUM IN THE FUEL. A TUMBLING DISSOLVER WAS FOUND TO BE VERY EFFECTIVE IN WASHING SIMULATED FUEL RESIDUE FROM CHOPPED CLADDING. DEVELOPMENT OF THE IODOX PROCESS WAS CONTINUED WITH A SERIES OF RUNS MADE IN A FIVE-PLATE BUBBLE-CAP TOWER 7.6 CM IN DIAMETER. STAGE DECONTAMINATION FACTORS AVERAGED APPROXIMATELY 4 FOR CH3I AT AN AIR RATE OF 56 LITERS/MIN. THE KRYPTON REMOVAL PILOT PLANT AT ORGDP PROGRESSED INTO THE INITIAL SHAKEDOWN OPERATION STAGE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

IODINE + KRYPTON + RUTHENIUM + URANIUM OXIDE + *FISSION PRODUCT TRANSPORT + PLUTONIUM OXIDE + ORGANIC IODIDE + WASHOUT + *FUEL REPROCESSING + R AND D PROGRAM + NITRATE + RETENTION + JACOBS

092495
YARBRO OO + JOY DS + HARRINGTON FE
EFFLUENT CONTROL IN FUEL REPROCESSING PLANTS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-TM-3899 +. 61 PAGES, TABLES, FIGURES, 3 REFERENCES, MARCH 1974

SUMMARIZES A STUDY OF HOW EXTRAPOLATIONS OF CURRENT AND DEVELOPING TECHNOLOGY MIGHT BE APPLIED TO THE TASK OF REDUCING RADIOACTIVE EFFLUENTS FROM FUTURE FUEL REPROCESSING PLANTS TO 'NEAR ZERO.' THE STUDY HAS INDICATED THAT VERY SIGNIFICANT REDUCTIONS OF EFFLUENTS CAN BE ACHIEVED BY INTEGRATING ADVANCED EFFLUENT CONTROL SYSTEMS WITH NEW CONCEPTS OF CONTAINMENT AND VENTILATION THAT WOULD REDUCE NET INLEAKAGE OF AIR TO THE PROCESS ENCLOSURES AND PROVIDE FOR EXTENSIVE RECYCLE OF GASES AND LIQUIDS. IF NET PLANT EFFLUENT FLOW RATES CAN BE THUS REDUCED AND IF THE HIGHLY EFFICIENT FISSION PRODUCT REMOVAL SYSTEMS, UNDER DEVELOPMENT, DO IN FACT BECOME AVAILABLE, IT SHOULD BE POSSIBLE TO REDUCE THE DISCHARGE OF ACTIVITY TO THE ENVIRONMENT IN FUTURE PLANTS BY FOUR TO SIX ORDERS OF MAGNITUDE. OVERALL PLANT RETENTION FACTORS IN THE ORDER OF 10(EXP 10) FOR IODINE, 10(EXP 5) FOR TRITIUM AND KRYPTON, AND 10(EXP 14) TO 10(EXP 16) FOR PARTICULATES APPEAR POSSIBLE.

AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO ERDA TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

EFFLUENT + IODINE + KPYPTON + PARTICLE + VENTILATION SYSTEM + CONTROL + CONTAINMENT LEAKAGE CONTROL + REDUCTION + FUEL REPROCESSING + JACOBS

092526
STEINDLER MJ + LEVITZ NM + TREVORROW LE + GERDING TJ + KULLEN BJ + WEBSTER DS + BURRIS L
CHEMICAL ENGINEERING DIVISION WASTE MANAGEMENT PROGRAMS QUARTERLY REPORT, OCTOBER-DECEMBER 1973
ARGONNE NATIONAL LABORATORY, ILLINOIS
ANL-8087 +. 41 PAGES, 7 TABLES, 3 FIGURES, 144 REFERENCES, FEBRUARY 1974

METAL-COMPACTION METHODS HAVE BEEN REVIEWED AND INFORMATION ON THE IRRADIATION-INDUCED PROPERTY CHANGES OF ZIRCALOY SURVEYED AS PART OF A STUDY ON THE HANDLING OF FUEL CLADDING HULLS. INFORMATION ORIGINATING FROM AEC-SITE VISITS AND FROM A REVIEW OF THE OPEN LITERATURE CONCERNING DECONTAMINATION OF PLUTONIUM-CONTAMINATED MATERIALS IS PRESENTED. THE TECHNICAL AND ECONOMIC FEASIBILITY OF ADAPTING REVERSE OSMOSIS TO THE CONCENTRATION OF TRITIUM FROM TRITIATED FUEL REPROCESSING WASTES WAS BRIEFLY EVALUATED. TECHNICAL FEASIBILITY WAS ASSUMED FROM LITERATURE REPORTS OF A DIFFERENCE OF ABOUT 3% IN THE SELF-DIFFUSION COEFFICIENTS OF THO AND H2O, AND POSSIBLY GREATER DIFFERENCES IN TRANSPORT RATES IN SOLUTION-DIFFUSION MEMBRANES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + CLADDING + NOBLE GAS + *WASTE STORAGE + *WASTE MANAGEMENT + ZIRCALOY + R AND D PROGRAM + FUEL, NUCLEAR + JACOBS

094095
OATES WH
RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION
U.S. DEPT. OF HEALTH, EDUCATION, AND WELFARE; BUREAU OF RADIOLOGICAL HEALTH
BRH/DCS 70-1 +. 29 PAGES, 7 TABLES, 43 REFERENCES, JANUARY 1970

WHILE NUCLEAR POWER REACTORS CONTAIN LARGE INVENTORIES OF RADIOACTIVE MATERIALS, THE EFFLUENT DISCHARGE DATA INDICATE THAT THEY DISCHARGE ONLY SMALL QUANTITIES OF RADIOACTIVE WASTES IN COMPARISON TO THEIR LICENSED LIMITS UNDER NORMAL OPERATING CONDITIONS. THIS SITUATION IS A RESULT OF CAREFUL WASTE MANAGEMENT PRACTICE, ENGINEERED SAFEGUARDS, AND PROPER OPERATING

094095 *CONTINUED*
PROCEDURES. ONLY TRITIUM AND INERT GASES DO NOT RESPOND TO CONVENTIONAL WASTE TREATMENT PROCESSES AND THEREFORE ARE USUALLY THE ONLY RADIONUCLIDES THAT ARE DISCHARGED IN ANY SIGNIFICANT QUANTITIES. THESE RADIONUCLIDES HAVE BEEN DISCHARGED, HOWEVER, AT RATES WELL BELOW THOSE SPECIFIED BY THE AEC.

AVAILABILITY - U.S. DEPT. OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, ENVIRONMENTAL CONTROL ADMINISTRATION, BUREAU OF RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND 20852

*DOSE + *EFFLUENT + FISSION PRODUCT RELEASE + NOBLE GAS + *WASTE MANAGEMENT + *POWER PLANT, NUCLEAR + JACOBS

094798
RHINEHAMMER TR + LAMBERGER PH
TRITIUM CONTROL TECHNOLOGY
MOUND LABORATORY, MIAMISBURG, OHIO
WASH-1269 +. 530 PAGES, FIGURES, DECEMBER 1973

THE PURPOSE OF THIS REPORT IS TO ASSEMBLE IN AN UNCLASSIFIED COMPENDIUM PERTINENT AEC CONTRACTOR AND PRIVATE INDUSTRY OPERATING EXPERIENCE WITH TRITIUM CONTAINMENT AND HANDLING, MONITORING, TRAPPING AND REMOVAL, AND STORAGE AND DISPOSAL SYSTEMS. THIS REPORT EMPHASIZES THE CAPABILITIES AND LIMITATIONS OF EXISTING TECHNOLOGY AND OPERATING TRITIUM CONTROL SYSTEMS AND DOES NOT DISCUSS CURRENT OR PROPOSED RESEARCH AND DEVELOPMENT PROGRAMS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

WASTE HANDLING + WASTE STORAGE + WASTE DISPOSAL, GAS + MONITORING SYSTEM, RADIATION + OPERATING EXPERIENCE + JACOBS

094858
SCHNEIDER KJ
QUARTERLY PROGRESS REPORT - STUDIES ON MANAGEMENT OF SELECTED WASTES, JANUARY THROUGH MARCH 1974
BATTELLE PACIFIC NORTHWEST LABORATORIES
BNWL-1825 +. 44 PAGES, 14 TABLES, 7 FIGURES, 4 REFERENCES, APRIL 1974

A LITERATURE REVIEW OF AQUEOUS, MOLTEN SALT, AND MELT FLUX DECONTAMINATION PROCESSES HAS INDICATED THAT WASTE STREAM MINIMIZATION, EASE OF OPERATION, AND DECONTAMINATION EFFICIENCY CAN PROBABLY BE OPTIMIZED BY A MODIFIED AQUEOUS DECONTAMINATION PROCESS FOLLOWED BY MELTING. THE REUSE OF METAL FROM DECONTAMINATION WOULD BE POSSIBLE AFTER LONG COOLING TIMES BUT ECONOMICS ARE NOT EVALUATED. EQUIPMENT REQUIRED FOR THE SCOPING STUDIES ON PYROLYSIS OF WASTES WAS FABRICATED AND INSTALLED DURING THE REPORTING PERIOD. SOLVENT EXTRACTION STUDIES ON TRITIUM HAVE SHOWN THAT COMPETITIVE FACTORS NEGATE MOST OF THE SEPARATION WHICH MIGHT BE EXPECTED. A FEW STUDIES ARE CONTINUING USING STRONGLY BASIC SOLVENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DECONTAMINATION + *WASTE TREATMENT + ZIRCONIUM + STEEL, STAINLESS + FISSION PRODUCT, SEPARATION FROM WASTE + LEACHING + SOLUTION + JACOBS

098138
LASER M + BARNER-WIEMER H
AKUT: A PROCESS FOR THE SEPARATION OF AEROSOLS, KRYPTON, AND TRITIUM FROM BURNER OFF-GAS IN HTR-FUEL REPROCESSING
KERNFORSCHUNGSANLAGE, JULICH, GERMANY
GERHTR-109 +. 19 PAGES, 7 FIGURES, 7 REFERENCES, AUGUST 15, 1974

THE AKUT-PROCESS CONSISTS OF THE FOLLOWING PROCESS STEPS: AEROSOL RETENTION BY AN ELECTROSTATIC SEPARATOR FOLLOWED BY HEPA FILTERS, OXIDATION OF CO WITH O2 OR REACTION OF EXCESS O2 WITH CO, RESPECTIVELY, COMPRESSION, SCRUBBING AND/OR LIQUEFACTION, SEPARATION OF KRYPTON BY DISTILLATION, SEPARATION OF TRITIATED WATER AND IODINE BY ADSORPTION OR CHEMICAL REACTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AEROSOL + GRAPHITE + KRYPTON + CARBON DIOXIDE + COMBUSTION + OFF GAS + FUEL REPROCESSING + REACTOR, HTGR

099345
QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING FEBRUARY 28, 1974 HTGR BASE PROGRAM
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
GA-A12916 +. 250 PAGES, FIGURES, MARCH 29, 1974

THE WORK REPORTED HERE INCLUDES STUDIES OF BASIC FISSION-PRODUCT DISTRIBUTION MECHANISMS, RECYCLE FUEL STUDIES (INCLUDING DESIGNING AND TESTING OF RECYCLE TEST ELEMENTS) AND EXPLORATION OF HEAD-END REPROCESSING METHODS (AS PART OF A NATIONAL RECYCLE PLAN AND OF A RECYLCE FUEL PLAN), AND PHYSICS AND FUEL MANAGEMENT STUDIES. MATERIALS STUDIES INCLUDE IRRADIATION AND ANALYSIS OF FUEL PARTICLES IN CAPSULES TO EVALUATE FUEL SYSTEMS, AND BASIC STUDIES OF CONTROL MATERIALS AND OF CARBON AND GRAPHITE. EXPERIMENTAL PROCEDURES AND RESULTS ARE DISCUSSED AND, WHERE APPROPRIATE, THE DATA ARE PRESENTED IN TABLES, GRAPHS, AND PHOTOGRAPHS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

099345 *CONTINUED*
CERIUM + CESIUM + COATED PARTICLE + DEPOSITION + GRAPHITE + STEAM + STRONTIUM + FISSION PRODUCT TRANSPORT + FISSION PRODUCT RETENTION + REACTOR, HTGR + FUEL RECYCLE

099746
SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS
WESTINGHOUSE ELECTRIC CORP., PA.
WCAP-8253 +. 207 PAGES, JUNE 11, 1974

THIS IS A COMPILATION OF OPERATING PLANT DATA THROUGH JUNE 1973 WHICH IS APPLICABLE TO THE EVALUATION OF PWR RADWASTE TREATMENT SYSTEMS AND THE CALCULATION OF RADIOACTIVE EFFLUENT SOURCE TERMS. CONCENTRATIONS OF FISSION AND CORROSION PRODUCTS IN THE RCS, IODINE SEPARATION FACTOR, PRIMARY TO SECONDARY LEAK RATES, AND TRITIUM RELEASE DATA FROM OPERATING WESTINGHOUSE PWR'S ARE PRESENTED. AN EXPECTED I-131 CONCENTRATION MODEL HAS BEEN DEVELOPED WHICH IS OFFERED AS A REPLACEMENT FOR THE INFERRED FUEL DEFECT MODEL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*DESIGN CRITERIA + EFFLUENT + FISSION PRODUCT, IODINE + *REACTOR, PWR + RELEASE RATE + *WASTE TREATMENT + ANALYTICAL MODEL + REACTOR COOLANT + CORROSION + FISSION PRODUCT ACTIVITY, GROSS + OPERATING EXPERIENCE + RADIATION SOURCE, INTERNAL + WESTINGHOUSE

101060
COOPER MH
METHOD OF AND FILTER FOR REMOVING TRITIUM FROM INERT GASES
U.S. PATENT 3,848,067 +. NOVEMBER 12, 1974

THIS PATENT RELATES TO A FILTER FOR REMOVING TRITIUM FROM AN INERT GAS AND A METHOD OF DOING THE SAME COMPRISING DIVIDED YTTRIUM COATED WITH NICKEL CONTACTED BY SAID GAS.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, WASHINGTON, D.C.

*UNITED STATES + PATENT + *FILTERS

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

(TAMPLIN A)
043979 P 8
(THOMPSON T)
049348 P 11
ABSORPTION
075295 P 19 083395 P 23
ACCIDENT, HYPOTHETICAL
044972 P 9
ACTINIDE
090352 P 24
ADMINISTRATIVE CONTROL
014861 P 3 028659 P 6 065374 P 15 072593 P 17
ADSORPTION
016014 P 4 035393 P 7 047256 P 10 079774 P 20
091611 P 24
ADSORPTION, RADIOISOTOPE
091611 P 24
AEROSOL
049452 P 11 087422 P 23 098138 P 26
AEROSOL PROPERTIES
049452 P 11
AGENCY, AEC
065420 P 15
AGENCY, FEDERAL
065195 P 15
AGENCY, MUNICIPAL
044068 P 8
AIR
008708 P 2 044916 P 9 077136 P 20 079774 P 20
080208 P 21 082317 P 22
AIR CLEANING
044650 P 9
AIRBORNE RELEASE
044916 P 9
ALPHA EMITTER
082317 P 22
AMERICIUM
005430 P 2
ANALYTICAL MODEL
099746 P 27
ANIMAL, BIRD
065374 P 15
ANIMAL, FISH
045016 P 10 077136 P 20 080208 P 21
AQUATIC ORGANISM
043979 P 8 065374 P 15
ARGON
008708 P 2 047086 P 10 065374 P 15
ASSIMILATION
048899 P 11
ATMOSPHERIC POLLUTION
010702 P 3 045009 P 10 075576 P 19 080208 P 21
082301 P 22 083190 P 22 083395 P 23
AUSTRIA
062009 P 14
BARIUM
005430 P 2 008708 P 2
BATTELLE NORTHWEST
021290 P 5 065087 P 14
BEHAVIOR
082301 P 22
BIBLIOGRAPHY
047256 P 10 082225 P 21
BIG ROCK POINT (BWR)
022928 P 5
BIOACCUMULATION/TURNOVER
075576 P 19
BIOLOGICAL CONTROL
043979 P 8
BIOMEDICAL
044674 P 9
BIOTA
065195 P 15 065953 P 16
BYPRODUCT MATERIAL
044916 P 9
CALCINATION
006781 P 2 082318 P 22
CALVERT CLIFFS 1 (PWR)
043979 P 8 044106 P 8 065420 P 15
CANADA
075295 P 19
CARBON
008708 P 2 035393 P 7
CARBON DIOXIDE
098138 P 26
CARBON MONOXIDE
035393 P 7
CERIUM
005341 P 1 005430 P 2 035171 P 7 099345 P 26
CESIUM
005341 P 1 005430 P 2 008330 P 2 008708 P 2
015822 P 4 021290 P 5 021930 P 5 023297 P 5
031408 P 7 035171 P 7 036783 P 8 043979 P 8
048899 P 11 058861 P 13 065087 P 14 065420 P 15
066059 P 16 075565 P 19 077136 P 20 080208 P 21
082317 P 22 082903 P 22 099345 P 26
CHALK RIVER
044674 P 9
CHARCOAL
016014 P 4 049452 P 11
CHARCOAL ADSORBER
049452 P 11
CHEMICAL KINETICS
046465 P 10
CHESAPEAKE BAY
065420 P 15
CHROMIUM
035171 P 7
CLADDING
092526 P 25
COATED PARTICLE
099345 P 26
COBALT
015822 P 4 019813 P 4 021930 P 5 035171 P 7
046465 P 10 065420 P 15 066059 P 16 075565 P 19
077136 P 20
CODES AND STANDARDS
043979 P 8 044972 P 9 045016 P 10 061944 P 13
065195 P 15 067891 P 16 072593 P 17
COMBUSTION
098138 P 26
COMPARISON
028659 P 6 057309 P 13
CONCENTRATION
045016 P 10 055028 P 12 058861 P 13 067891 P 16
075565 P 19 077136 P 20 077193 P 20 080208 P 21
082301 P 22 082317 P 22
CONCENTRATION, MAXIMUM
044916 P 9
CONDENSATION
044650 P 9
CONGRESSIONAL ACTIVITY
043979 P 8
CONSTRUCTION PERMIT PROCESS
041523 P 8
CONTAINMENT
044650 P 9
CONTAINMENT DESIGN
061944 P 13
CONTAINMENT FILTERING SYSTEM
014861 P 3
CONTAINMENT INTEGRITY
044972 P 9
CONTAINMENT LEAKAGE CONTROL
075295 P 19 092495 P 25
CONTAINMENT R AND D
044674 P 9
CONTAINMENT, FUEL REPROCESSING
086883 P 23
CONTAINMENT, UNDERGROUND
074887 P 18
CONTAMINATION
044650 P 9
CONTROL
092495 P 25
CONTROL SYSTEM
056882 P 12
COOK 1 (PWR)
044068 P 8
COOLANT PURIFICATION SYSTEM
016512 P 4 056882 P 12
CORROSION
099746 P 27
COVER GAS

056882 P 12
CRITICAL NUCLIDE PATHWAY
066059 P 16 075295 P 19 075576 P 19 077136 P 20
080208 P 21 082903 P 22
CRUSTACEAN
043979 P 8
DATA COLLECTION
028659 P 6 043979 P 8 065195 P 15 065420 P 15
DECAY HEAT
016512 P 4 082318 P 22
DECONTAMINATION
036783 P 8 061944 P 13 074877 P 18 080812 P 21
083395 P 23 092526 P 25 094858 P 26
DEPOSITION
004978 P 1 005350 P 1 099345 P 26
DESIGN CRITERIA
069814 P 16 099746 P 27
DESTRUCTIVE WIND
065087 P 14
DIFFUSION
028836 P 6 044916 P 9 049452 P 11 052442 P 12
DILUTION
048899 P 11 075626 P 20
DISCHARGE
028659 P 6 066059 P 16 074877 P 18 075626 P 20
DISPERSION
048899 P 11
DOSE
008708 P 2 053739 P 12 075295 P 19 082301 P 22
082317 P 22 094095 P 25
DOSE CALCULATION, EXTERNAL
005430 P 2 055028 P 12 077136 P 20 080208 P 21
DOSE CALCULATION, INTERNAL
005430 P 2
DOSE MEASUREMENT, EXTERNAL
021930 P 5 055028 P 12
DRESDEN I (BWR)
022928 P 5
DRY
075295 P 19
EARTHQUAKE
021930 P 5
EBR 1 AND 2 (RE)
035171 P 7
ECOLOGY
044106 P 8 044674 P 9 075576 P 19
ECONOMICS
056491 P 12 057309 P 13 062009 P 14 080812 P 21
086883 P 23 089576 P 24
ECOSYSTEM
065087 P 14 082301 P 22
ECOSYSTEM, AQUATIC
065087 P 14 075576 P 19
ECOSYSTEM, ARCTIC
065087 P 14
ECOSYSTEM, DESERT
065087 P 14
ECOSYSTEM, ESTUARINE
075576 P 19
ECOSYSTEM, GRASSLAND
065087 P 14
ECOSYSTEM, MARINE
075576 P 19
ECOSYSTEM, MODEL
075576 P 19
EFFECT
057309 P 13
EFFECT, GENETIC
043979 P 8 065195 P 15 065420 P 15
EFFECT, PH
082903 P 22
EFFECT, SOMATIC
065420 P 15
EFFLUENT
004955 P 1 004978 P 1 005350 P 1 028659 P 6
036783 P 8 055028 P 12 057309 P 13 065195 P 15
065656 P 15 066059 P 16 067891 P 16 072709 P 17
074877 P 18 074887 P 18 074952 P 19 075626 P 20
077136 P 20 080208 P 21 082903 P 22 083395 P 23
089425 P 23 092495 P 25 094095 P 25 099746 P 27
ELECTRIC POWER
065195 P 15
ELEMENTS AND ISOTOPES
072593 P 17
ELK RIVER (BWR)
022928 P 5
EMERGENCY PROCEDURE
061944 P 13 065374 P 15
ENEA
072593 P 17
ENERGY LEVEL
082318 P 22
ENRICHMENT FACILITY
065656 P 15
ENVIRONMENT
021930 P 5 026177 P 6 044674 P 9 045009 P 10
057309 P 13 061944 P 13 062005 P 13 065195 P 15
065374 P 15 066059 P 16 075295 P 19 075576 P 19
082301 P 22 090352 P 24
ENVIRONMENTAL CONTROL MEASURE
044106 P 8 056491 P 12
EQUIPMENT DESIGN
044916 P 9
EQUIPMENT DEVELOPMENT
045009 P 10
EURATOM
075576 P 19
EVAPORATION
031408 P 7 080812 P 21 083190 P 22
EXPERIMENT
031408 P 7
FABRICATION
047256 P 10
FAILURE, TUBING
016512 P 4
FALLOUT
044674 P 9 048899 P 11
FIELD EXPERIMENT
082903 P 22
FILTERS
049452 P 11 101060 P 27
FIRE
065087 P 14
FISSION GAS RELEASE
010702 P 3 049452 P 11 089425 P 23
FISSION PRODUCT ACTIVITY, GROSS
099746 P 27
FISSION PRODUCT RELEASE
045009 P 10 045016 P 10 049348 P 11 056491 P 12
065420 P 15 077193 P 20 082317 P 22 094095 P 25
FISSION PRODUCT RETENTION
045009 P 10 086883 P 23 087422 P 23 092493 P 24
099345 P 26
FISSION PRODUCT TRANSPORT
092494 P 25 099345 P 26
FISSION PRODUCT, IODINE
049452 P 11 086883 P 23 099746 P 27
FISSION PRODUCT, SEPARATION FROM WASTE
006781 P 2 094858 P 26
FISSION PRODUCT, VOLATILE
092493 P 24
FLOW, LAMINAR
047086 P 10
FOOD
082317 P 22
FOOD CHAIN
043979 P 8 044106 P 8 065087 P 14 075295 P 19
075576 P 19 080208 P 21 082301 P 22
FORECAST
074877 P 18 075576 P 19 077193 P 20 082318 P 22
FRC
043979 P 8 045016 P 10
FUEL BURNUP
036242 P 8 072213 P 17
FUEL CONVERSION
047256 P 10
FUEL ELEMENTS
047256 P 10 082317 P 22
FUEL HANDLING
082317 P 22
FUEL RECYCLE
099345 P 26
FUEL REPROCESSING
010702 P 3 014871 P 3 028659 P 6 031408 P 7
035171 P 7 036242 P 8 041523 P 8 043979 P 8
044972 P 9 045016 P 10 047256 P 10 057309 P 13
058861 P 13 062009 P 14 065195 P 15 066059 P 16
072213 P 17 072593 P 17 072709 P 17 074874 P 18
074877 P 18 074887 P 18 077136 P 20 079774 P 20
080208 P 21 082317 P 22 082318 P 22 086883 P 23
087422 P 23 089425 P 23 092493 P 24 092494 P 25
092495 P 25 098138 P 26
FUEL STORAGE
082317 P 22
FUEL, NUCLEAR
072709 P 17 080208 P 21 092526 P 25
GAS
028659 P 6 035393 P 7 057309 P 13 072136 P 17
072709 P 17 074887 P 18 080812 P 21 082301 P 22
GEOLOGY
004978 P 1 005341 P 1 005350 P 1 008330 P 2
021930 P 5 023297 P 5 049247 P 11 065420 P 15

074887 P 18 079774 P 20 083190 P 22
GEOLOGY, GEOCHEMICAL
008330 P 2
GEOLOGY, GEOPHYSICAL
008330 P 2
GEOLOGY, SALT STRUCTURE
021930 P 5
GERMANY
008708 P 2 036242 P 8 074887 P 18 087422 P 23
GLASS
006781 P 2
GRAPHITE
098138 P 26 099345 P 26
GROSS ALPHA
021290 P 5
GROSS BETA
021290 P 5
GROUND WATER
004955 P 1 004978 P 1 005350 P 1 008330 P 2
021290 P 5
GROUND WATER, NUCLIDE OCCURRENCE
005341 P 1 008330 P 2 021290 P 5 075565 P 19
GROUND WATER, PROPERTY
005341 P 1 008330 P 2
GROUND WATER, TRACER
005341 P 1
GROWTH/DEVELOPMENT
090352 P 24
GUIDE
061944 P 13 082301 P 22
HANFORD SITE
014871 P 3 021290 P 5 044674 P 9
HAZARD, RELATIVE
004978 P 1
HAZARDS ANALYSIS
005430 P 2 082301 P 22
HEAT EXCHANGERS
016512 P 4
HEAT PIPE
056882 P 12
HIGH RADIATION
074874 P 18
HPIS
077136 P 20 077193 P 20 082301 P 22 082317 P 22
082318 P 22
HUMBOLDT BAY (BWR)
022928 P 5
HYDRIDE
089576 P 24
HYDROGEN
035393 P 7 047086 P 10
HYDROLOGY
008330 P 2 023297 P 5 028836 P 6 049247 P 11
052442 P 12 053071 P 12 065420 P 15
IAEA
019813 P 4 062005 P 13 062009 P 14
ICRP
043979 P 8 072593 P 17
IDAHO FALLS
014871 P 3 035171 P 7
INCIDENT, EXPOSURE
005430 P 2
INCINERATION
036783 P 8
INDIAN POINT 1 (PWR)
022928 P 5
INDUSTRY, NUCLEAR
043979 P 8 045009 P 10 045016 P 10 049348 P 11
056491 P 12 079774 P 20 090352 P 24
INDUSTRY, UTILITY
065374 P 15
INGESTION
077136 P 20
INHALATION
077136 P 20
INSECT
082903 P 22
INTERNATIONAL
065374 P 15
IODINE
005430 P 2 008708 P 2 023297 P 5 035171 P 7
036242 P 8 061944 P 13 062005 P 13 065152 P 14
072709 P 17 074877 P 18 074881 P 18 075295 P 19
077136 P 20 079774 P 20 080208 P 21 090352 P 24
092494 P 25 092495 P 25
ION EXCHANGE
006781 P 2 028836 P 6 031408 P 7 046465 P 10
047256 P 10 082301 P 22
JACOBS
086883 P 23 087422 P 23 089425 P 23 089576 P 24
090352 P 24 092493 P 24 092494 P 25 092495 P 25
092526 P 25 094095 P 25 094798 P 26 094858 P 26
JAPAN
074874 P 18
KRYPTON
008708 P 2 010702 P 3 021930 P 5 028005 P 6
035393 P 7 043979 P 8 044972 P 9 045009 P 10
045016 P 10 047086 P 10 061944 P 13 062005 P 13
065195 P 15 065374 P 15 065953 P 16 066059 P 16
072136 P 17 072593 P 17 072709 P 17 074876 P 18
074877 P 18 074881 P 18 075626 P 20 077136 P 20
079774 P 20 080208 P 21 082317 P 22 082318 P 22
086883 P 23 087422 P 23 090352 P 24 092493 P 24
092494 P 25 092495 P 25 098138 P 26
LAKE MICHIGAN
048899 P 11 056491 P 12
LASL
082903 P 22
LEACHING
094858 P 26
LEAD
019813 P 4
LEAK
076844 P 20
LICENSE APPLICATION
065656 P 15
LICENSE STATUS
065656 P 15
LIQUID
028659 P 6 072136 P 17 072709 P 17 074887 P 18
075626 P 20
LITIGATION
044068 P 8
MAMMAL
065016 P 10
MAMMAL, LARGE
077136 P 20 080208 P 21
MAMMAL, RODENT
082903 P 22
MAN
045016 P 10 066059 P 16 082301 P 22 082317 P 22
MEASUREMENT
058861 P 13 077136 P 20
METEOROLOGY
065420 P 15
MILK
077136 P 20
MINERAL EXCHANGE
006781 P 2 021930 P 5 082301 P 22
MODEL
082301 P 22
MODEL, DETERMINISTIC
075576 P 19
MODIFICATION
086883 P 23
MOLECULAR SIEVE
075295 P 19
MOLLUSC
065374 P 15
MONITOR
029033 P 7 082225 P 21
MONITOR, AREA
061944 P 13 075565 P 19
MONITOR, ENVIRONMENTAL
044972 P 9 065656 P 15 067891 P 16 077193 P 20
MONITOR, GENERAL PRACTICE
004276 P 1
MONITOR, LIQUID
028836 P 6
MONITORING PROGRAM, ENVIRONMENTAL
058861 P 13
MONITORING SYSTEM, RADIATION
094798 P 26
MPC
008708 P 2 029033 P 7 048899 P 11 055028 P 12
062381 P 14 065152 P 14 075626 P 20
N-POWER FORECAST
028659 P 6 065953 P 16
N-POWER, SAFETY OF
044106 P 8 065195 P 15 065420 P 15
NCRP
043979 P 8
NEPTUNIUM
005430 P 2
NFS
041523 P 8 044972 P 9 045016 P 10 058861 P 13
066059 P 16 072709 P 17 086883 P 23
NIOBIUM
023297 P 5
NITRATE
092494 P 25
NITROGEN

047086 P 10
NOBLE GAS
075295 P 19 075576 P 19 092526 P 25 094095 P 25
NRTS
008330 P 2 015822 P 4 023297 P 5 035171 P 7
075565 P 19
NS SAVANNAH (PWR)
012211 P 3 014861 P 3
NUCLEAR DETONATION
081106 P 21 082903 P 22
OCEAN AND SEA
065374 P 15 082301 P 22 089425 P 23
OCEAN, PACIFIC
067891 P 16
OFF GAS
036242 P 8 047086 P 10 074881 P 18 079774 P 20
092493 P 24 098138 P 26
OFF SITE
044916 P 9
OPERATING EXPERIENCE
022928 P 5 029033 P 7 044650 P 9 044916 P 9
075565 P 19 075626 P 20 094798 P 26 099746 P 27
OPERATING EXPERIENCE SUMMARY
004276 P 1 055028 P 12
OPERATING LICENSE PROCESS
044972 P 9 065656 P 15
OPPONENT
043979 P 8 044068 P 8
ORE CONVERSION
047256 P 10
ORGANIC IODIDE
049452 P 11 092494 P 25
ORGANIZATION, CITIZEN
045016 P 10
ORGANIZATION, INTERNATIONAL
075576 P 19
ORNL
017550 P 4 086883 P 23
OXIDATION
081106 P 21
OXYGEN
047086 P 10
PARTICLE
092495 P 25
PARTICLE, RADIOACTIVE
065152 P 14
PATENT
081106 P 21 101060 P 27
PERSONNEL EXPOSURE, RADIATION
009022 P 3 082317 P 22
PLANT PROTECTIVE SYSTEM
083395 P 23
PLANT, SEEDLING
065087 P 14
PLOWSHARE
080812 P 21
PLUTONIUM
005430 P 2 008708 P 2 072213 P 17 082317 P 22
082903 P 22
PLUTONIUM OXIDE
092494 P 25
POLLUTION
062005 P 13 065195 P 15 075576 P 19
POLONIUM
005430 P 2 019813 P 4
POPULATION EXPOSURE
055028 P 12 062381 P 14 065152 P 14 065420 P 15
066059 P 16 074877 P 18 077136 P 20 080208 P 21
082301 P 22 082317 P 22 090352 P 24
POPULATION RESPONSE
062005 P 13
POWER PLANT, NUCLEAR
079774 P 20 094095 P 25
PRECIPITATION
028836 P 6
PROCEDURES AND MANUALS
044650 P 9
PRODUCTION
072136 P 17 077193 P 20
PROPONENT
044106 P 8
PUBLIC RELATIONS
065374 P 15
R AND D PROGRAM
062009 P 14 074874 P 18 092494 P 25 092526 P 25
RADIATION DAMAGE
036242 P 8
RADIATION EFFECT
049348 P 11 065087 P 14 065195 P 15 065420 P 15
RADIATION EXPOSURE
065195 P 15 077136 P 20 082317 P 22 090352 P 24
RADIATION IN PERSPECTIVE
065953 P 16
RADIATION MONITORS
014861 P 3
RADIATION SAFETY AND CONTROL
026177 P 6 028836 P 6 029033 P 7 044972 P 9
065195 P 15 065420 P 15 065656 P 15 066059 P 16
072136 P 17 072709 P 17 077193 P 20 082225 P 21
082317 P 22
RADIATION SOURCE, INTERNAL
099746 P 27
RADIATION, PUBLIC EDUCATION
044106 P 8
RADIOACTIVITY RELEASE
026177 P 6 028659 P 6 043979 P 8 044106 P 8
045009 P 10 045016 P 10 055028 P 12 058861 P 13
061944 P 13 065374 P 15 065420 P 15 066059 P 16
067891 P 16 072709 P 17 075565 P 19 075626 P 20
077193 P 20 082301 P 22 083190 P 22 090352 P 24
RADIOCHEMICAL PLANT SAFETY
010702 P 3
RADIOCHEMICAL PROCESSING
047256 P 10
RADIOISOTOPE
019813 P 4 044674 P 9 047256 P 10 052245 P 12
052442 P 12 053739 P 12 067891 P 16 072593 P 17
RADIOLOGICAL ASSISTANCE
074877 P 18
RADIONUCLIDE TRANSFER
044674 P 9
RADIONUCLIDE UPTAKE
045016 P 10 065087 P 14 065953 P 16 075295 P 19
075576 P 19 082903 P 22
RADIONUCLIDE, INDUCED
022928 P 5
RADIUM
005430 P 2
RANCHO SECO (PWR)
076844 P 20
REACTOR
035171 P 7 052442 P 12 053071 P 12 053739 P 12
079774 P 20
REACTOR COOLANT
099746 P 27
REACTOR POWER
026177 P 6 028005 P 6 028659 P 6 067891 P 16
REACTOR TEST FACILITY
075565 P 19
REACTOR, BWR
022928 P 5 062381 P 14
REACTOR, HTGR
089425 P 23 098138 P 26 099345 P 26
REACTOR, HWR
016512 P 4
REACTOR, LMFBR
089425 P 23
REACTOR, LWR
089425 P 23
REACTOR, MARITIME
012211 P 3 014861 P 3
REACTOR, MOLTEN SALT
089425 P 23
REACTOR, POWER
021930 P 5 022928 P 5 028659 P 6 029033 P 7
043979 P 8 044068 P 8 044106 P 8 045009 P 10
047256 P 10 049348 P 11 056491 P 12 065374 P 15
065656 P 15 072593 P 17 075626 P 20
REACTOR, PRODUCTION
044674 P 9
REACTOR, PWR
012211 P 3 014861 P 3 022928 P 5 044650 P 9
065953 P 16 067891 P 16 069814 P 16 099746 P 27
REACTOR, RESEARCH
004276 P 1 016512 P 4
REACTOR, THERMONUCLEAR
056882 P 12
RECONCENTRATION
048899 P 11
RECOVERY PROCESS
079774 P 20
REDUCTION
044650 P 9 092495 P 25
REGULATION
044972 P 9 065656 P 15 072593 P 17 072709 P 17
082301 P 22
REGULATION, AEC
058861 P 13 062381 P 14 065152 P 14 065656 P 15
067891 P 16 075626 P 20
REGULATION, FEDERAL
067891 P 16
REGULATION, STATE

065195 P 15
RELEASE RATE
075295 P 19 099746 P 27
REPORT, OPERATIONS
046465 P 10
REPORT, SAR
016512 P 4
RESEARCH CONTRACT
046465 P 10
RESEARCH, GOVERNMENT
065087 P 14
RESOURCE, NATURAL
080812 P 21
RESPONSE TO NRC QUESTION
016512 P 4
RETENTION
092494 P 25
REVIEW
086883 P 23
RHODIUM
021290 P 5 077136 P 20
RIVER
004978 P 1 005350 P 1
RIVER, COLUMBIA
065087 P 14
ROCK MECHANICS
021930 P 5 083190 P 22
RUTHENIUM
005341 P 1 006781 P 2 015822 P 4 021290 P 5
035171 P 7 058861 P 13 065420 P 15 066059 P 16
077136 P 20 092494 P 25
SAFETY EVALUATION
014861 P 3 021930 P 5 074877 P 18 074881 P 18
074887 P 18 077193 P 20
SAFETY REVIEW
072136 P 17
SAN ONOFRE 1 (PWR)
067891 P 16
SAVANNAH RIVER PLANT
028836 P 6 044674 P 9 049247 P 11
SEDIMENT
005350 P 1 058861 P 13
SINTERING
028005 P 6
SITING
008330 P 2
SITING, CHEMICAL PROCESS PLANT
044972 P 9
SITING, REACTOR
065374 P 15
SITING, WASTE DISPOSAL
004978 P 1 005341 P 1 074887 P 18
SOCIO/PHILOSOPHICAL CONSIDERATION
043979 P 8
SODIUM
005430 P 2
SOIL
052245 P 12 052442 P 12 053071 P 12 082301 P 22
089576 P 24
SOIL PROPERTY, IN SITU
065087 P 14
SOIL, NUCLIDE OCCURRENCE
008330 P 2 083190 P 22
SOIL, RADIONUCLIDE MOVEMENT THROUGH
004955 P 1 005341 P 1 005350 P 1 028836 P 6
SOLID
052245 P 12 072136 P 17 074874 P 18
SOLUTION
094858 P 26
SOLVENT EXTRACTION PROCESS
036242 P 8 041523 P 8
SOURCE, RADIATION
075626 P 20
SPOKESMAN, AEC
045016 P 10 049348 P 11 065420 P 15
SPOKESMAN, FEDERAL
065195 P 15
SPOKESMAN, STATE
044068 P 8
SPOKESMAN, UTILITY
044106 P 8
STACK
008708 P 2 044916 P 9 047086 P 10 074952 P 19
075626 P 20 080812 P 21
STEAM
044650 P 9 099345 P 26
STEEL, STAINLESS
094858 P 26
STIMULATION
080812 P 21
STORAGE CONTAINER
075626 P 20 082318 P 22
STRONTIUM
005341 P 1 005350 P 1 005430 P 2 006781 P 2
008330 P 2 008708 P 2 015822 P 4 021290 P 5
023297 P 5 035171 P 7 036783 P 8 043979 P 8
047256 P 10 048899 P 11 049247 P 11 058861 P 13
065420 P 15 066059 P 16 075565 P 19 077136 P 20
080208 P 21 082317 P 22 099345 P 26
SURFACE CONTAMINATION
083190 P 22
SURFACE WATER
005350 P 1 089425 P 23
SURFACE WATER, NUCLIDE OCCURRENCE
004978 P 1
SURVEILLANCE PROGRAM
028659 P 6 061944 P 13 067891 P 16
SURVEY
065195 P 15
SURVEY, ENVIRONMENT
082903 P 22
SURVEY, RADIATION
090352 P 24
SYSTEM ANALYSIS
075576 P 19
SYSTEM CAPACITY
048899 P 11
TECHNICAL SPECIFICATIONS
012211 P 3 014861 P 3
TELLURIUM
005430 P 2
TEST, BENCH
046465 P 10
TEST, DOP FILTER
014861 P 3
TESTING
049652 P 11 052442 P 12 053071 P 12
THERMAL CONSIDERATION
028836 P 6
THERMAL POLLUTION
044068 P 8 062005 P 13 065087 P 14 065374 P 15
065420 P 15 075295 P 19
THORIUM
010702 P 3
TRANSPIRATION
083190 P 22
TRANSPORT
052245 P 12 053071 P 12 082301 P 22 083190 P 22
TRANSPORTATION AND HANDLING
044972 P 9
TRANSURANIUM ELEMENT
082317 P 22
TUBING
076844 P 20
UNITED KINGDOM
004276 P 1 065374 P 15
UNITED STATES
057309 P 13 081106 P 21 101060 P 27
URANIUM
005430 P 2 015822 P 4 065656 P 15 082317 P 22
URANIUM DIOXIDE
010702 P 3
URANIUM OXIDE
092494 P 25
VAPOR EXCHANGE
082301 P 22
VEGETATION
082301 P 22 082903 P 22
VENTILATION SYSTEM
044916 P 9 092495 P 25
VOLATILITY PROCESS
017550 P 4
WASHOUT
092494 P 25
WASTE DISPOSAL
008330 P 2 009022 P 3 014861 P 3 015822 P 4
019813 P 4 021290 P 5 021930 P 5 023297 P 5
048899 P 11 049247 P 11 052245 P 12 052442 P 12
053071 P 12 053739 P 12 057309 P 13 062005 P 13
062009 P 14 065087 P 14 066059 P 16 072136 P 17
072593 P 17 074877 P 18 074881 P 18 075576 P 19
075626 P 20 076844 P 20 079774 P 20 080812 P 21
082225 P 21 089425 P 23
WASTE DISPOSAL, ATMOSPHERIC
004955 P 1 004978 P 1 010702 P 3 014871 P 3
022928 P 5 065953 P 16
WASTE DISPOSAL, BEDROCK
019813 P 4 041523 P 8
WASTE DISPOSAL, DEEP WELL
074887 P 18 080812 P 21
WASTE DISPOSAL, ECONOMICS
017550 P 4 022928 P 5 072136 P 17

WASTE DISPOSAL, GAS
014871 P 3 015822 P 4 017550 P 4 019813 P 4
022928 P 5 035171 P 7 044916 P 9 055028 P 12
062381 P 14 065152 P 14 069814 P 16 094798 P 26
WASTE DISPOSAL, HYDRAULIC FRACTURING
021930 P 5
WASTE DISPOSAL, LIQUID
014871 P 3 015822 P 4 019813 P 4 021290 P 5
022928 P 5 035171 P 7 041523 P 8 047256 P 10
055028 P 12 058861 P 13 062381 P 14 065152 P 14
069814 P 16 075565 P 19 076844 P 20
WASTE DISPOSAL, OCEAN
012211 P 3 019813 P 4 067891 P 16 074881 P 18
082318 P 22
WASTE DISPOSAL, RIVER
004978 P 1 005350 P 1 019813 P 4 022928 P 5
065953 P 16
WASTE DISPOSAL, SALT
017550 P 4 021930 P 5 036783 P 8 082318 P 22
WASTE DISPOSAL, SOLID
015822 P 4 017550 P 4 019813 P 4 022928 P 5
026177 P 6 028836 P 6 035171 P 7 044972 P 9
069814 P 16 089576 P 24
WASTE DISPOSAL, TERRESTRIAL
004955 P 1 004978 P 1 005341 P 1 005350 P 1
021290 P 5 021930 P 5 041523 P 8 082318 P 22
082903 P 22
WASTE HANDLING
036783 P 8 094798 P 26
WASTE HEAT, WATER
065374 P 15
WASTE MANAGEMENT
017550 P 4 019813 P 4 021930 P 5 022928 P 5
026177 P 6 029033 P 7 031408 P 7 035171 P 7
036783 P 8 047256 P 10 049247 P 11 049348 P 11
057309 P 13 058861 P 13 062005 P 13 062009 P 14
062381 P 14 065152 P 14 065195 P 15 065420 P 15
069814 P 16 072136 P 17 072593 P 17 074874 P 18
074877 P 18 074887 P 18 074952 P 19 075565 P 19
075626 P 20 077193 P 20 081106 P 21 082318 P 22
089425 P 23 089576 P 24 092526 P 25 094095 P 25
WASTE SOLIDIFICATION
082318 P 22
WASTE SOURCE AND TYPE
005350 P 1 022928 P 5 028659 P 6
WASTE STORAGE
021930 P 5 028005 P 6 028836 P 6 036783 P 8
044972 P 9 065195 P 15 072136 P 17 072593 P 17
074874 P 18 075626 P 20 079774 P 20 080812 P 21
082318 P 22 083190 P 22 092526 P 25 094798 P 26
WASTE TRANSPORTATION
017550 P 4 075626 P 20 080812 P 21
WASTE TREATMENT
019813 P 4 036783 P 8 044674 P 9 072593 P 17
074881 P 18 074952 P 19 075295 P 19 075565 P 19
081106 P 21 082318 P 22 094858 P 26 099746 P 27
WASTE TREATMENT, ECONOMICS
017550 P 4 028836 P 6 074881 P 18
WASTE TREATMENT, EQUIPMENT
016014 P 4 069814 P 16
WASTE TREATMENT, FIXATION
005350 P 1 006781 P 2 017550 P 4 019813 P 4
021930 P 5 028005 P 6 089576 P 24
WASTE TREATMENT, GAS
016014 P 4 019813 P 4 074874 P 18 083395 P 23
087422 P 23 091611 P 24
WASTE TREATMENT, LIQUID
005350 P 1 019813 P 4 021930 P 5 031408 P 7
047256 P 10 072213 P 17 074874 P 18
WASTE TREATMENT, SOLID
019813 P 4 021930 P 5 028836 P 6 074874 P 18
WATER
004955 P 1 023297 P 5 052245 P 12 052442 P 12
053071 P 12 077136 P 20 080208 P 21 082301 P 22
WATER POLLUTION
043979 P 8 044068 P 8 044106 P 8 048899 P 11
075576 P 19 080208 P 21
WATER TREATMENT
021930 P 5
WATER VAPOR
082301 P 22 083190 P 22 083395 P 23
WATER, DRINKING
055028 P 12 082317 P 22
WESTINGHOUSE
099746 P 27
XENON
008708 P 2 047086 P 10 062005 P 13 072709 P 17
075626 P 20 079774 P 20
YANKEE ROWE (PWR)
022928 P 5
YEAR
053071 P 12
ZINC
019813 P 4 065087 P 14 065420 P 15
ZION 1 (PWR)
044068 P 8 045009 P 10 056491 P 12
ZIRCALOY
092526 P 25
ZIRCONIUM
023297 P 5 094858 P 26

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

AMAVIS RJ
075576 P 19
AMES LL
031408 P 7
ANDERS G
079774 P 20
ARNOLD WD
080812 P 21
BARNER-WIEMER H
098138 P 26
BARRACLOUGH JT
023297 P 5
BARRY PJ
075295 P 19
BAUMGARTNER F
036242 P 8
BEAUJEAN H
087422 P 23
BELTER WG
062005 P 13
BERLIN A
075576 P 19
BJERGE T
028005 P 6
BLANCO RE
005350 P 1 017550 P 4 021930 P 5
BLATCHFORD JD
069814 P 16
BLOMEKE JO
004978 P 1 017550 P 4 022928 P 5 029033 P
BOOTH RL
086883 P 23
BRYANT PM
074877 P 18
BURGER LL
089576 P 24
BURRIS L
092526 P 25
CARR WH
092493 P 24
COFFIN DO
083395 P 23
COOK JE
005430 P 2
COOPER HH
101060 P 27
COWLES JO
081106 P 21
COWSER KE
026177 P 6
CROWSON DL
077193 P 20
DUBE CM
083395 P 23
EISENBUD M
082317 P 22
ELIASON JR
021290 P 5
FABIAN H
091611 P 24
FENIMORE JW
052245 P 12
FINEMAN P
006781 P 2
FOLSOM TR
067891 P 16
FRANCOIS B
049452 P 11
GAMERTSFELDER CC
055028 P 12
GERDING TJ
092526 P 25
GOLDIN AS
061944 P 13
GOODE JH
010702 P 3
GRAY JH
092493 P 24
HAKONSON TE
082903 P 22
HANEY WA
004955 P 1 014871 P 3
HARRINGTON FF
022928 P 5 029033 P 7 092495 P 25
HECKMAN RA
081106 P 21
HICKEY JWM
066059 P 16
HILD H
074887 P 18
HOGG RM
075626 P 20
HOLLIDAY JN
074952 P 19
HUNZINGER W
072213 P 17
IRVINE AR
092494 P 25
JACKSON RF
004276 P 1
JENSEN RG
023297 P 5
JOHNSON LJ
082903 P 22
JONES JA
074877 P 18
JONES PH
052442 P 12
JOY DS
092495 P 25
JUNKINS RL
044674 P 9
KARP W
009022 P 3
KENT CE
062381 P 14
KONIG LA
008708 P 2
KRAUSE H
036783 P 8 074887 P 18
KULLEN BJ
092526 P 25
LAGACHE MP
069814 P 16
LAKEY LT
075565 P 19
LAMBERGER PM
094798 P 26
LASER H
087422 P 23 098138 P 26
LASER H, ET AL.
074881 P 18
LEE JY
076844 P 20
LEVITZ NM
092526 P 25
LIN KH, ET AL.
080812 P 21
LOGSDON JE
028659 P 6 066059 P 16
MAILEN JC
092494 P 25
MARKO AM
075295 P 19
MARTER WL
028836 P 6
MARTIN JA
077136 P 20 080208 P 21
MCBRIDE JA
044972 P 9
MEHANN RO
012211 P 3
MERCER BW
031408 P 7
MERRITT WF
005341 P 1
MERZ E
074881 P 18
MOELLER WD
061944 P 13
MORRIS DA
008330 P 2
MURBACH EW
092493 P 24
MUSGRAVE BC
089425 P 23
NAKAJIMA K
074874 P 18
NEBEKER RL
075565 P 19

NICHOLS JP
072709 P 17
NORTH ED
086883 P 23
NYMAN JW
082903 P 22
OATES WH
094095 P 25
OPHEL IL
075295 P 19
OSLOOND JH
015822 P 4
OSTLUND HG
082301 P 22
PARKER FL
005350 P 1 021930 P 5 053739 P 12 057309 P
PARKHURST RG
031408 P 7
PARSONS PJ
005341 P 1
POITRAS JP
016014 P 4
PURTYMUN WD
083190 P 22
RADFORD EP
043979 P 8
REICHERT SO
049247 P 11
RHINEHAMMER TB
094798 P 26
RICHTER D
079774 P 20
ROBERTS JT
017550 P 4
ROBERTSON JB
023297 P 5
ROBINSON TL
028659 P 6
RYAN JL
089576 P 24
SALMON R
080812 P 21
SAUER K
074887 P 18
SCHMALZ BL
015822 P 4
SCHNEIDER KJ
094858 P 26
SCHULZE H
079774 P 20
SLANSKY CM
062009 P 14
SMEETS JGPM
075576 P 19
SMITH JM
062381 P 14
STEINDLER MJ
092526 P 25
STIGALL GE
048899 P 11
STOLL RD
083395 P 23
STRAUB CP
047256 P 10
TEASDALE WE
008330 P 2 023297 P 5
THOMPSON TJ
049348 P 11
TREVORROW LE
092526 P 25
UNGER WE
072709 P 17 092494 P 25
US GEOL SURVEY
053071 P 12
VAN WAVEREN NJ
047086 P 10
VAUGHAN BE
065087 P 14
VYGEN H
074881 P 18 087422 P 23
WATSON CD
092494 P 25
WEBSTER DS
092526 P 25
WERNER RW
056882 P 12
WILSON R
075295 P 19
WILSON RL
076844 P 20
WRIGHT JH
065953 P 16
YARBRO DD
072709 P 17 092495 P 25
ZEHME S
008708 P 2

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN THE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE. * INDICATES END OF TITLE.)

#WASTE MANAGEMENT RESEARCH	ABSTRACTS NO. 2*	019813 P 4
#PUBLIC	ACCEPTANCE NO PROBLEM IN UNITED KINGDOM*	065374 P 15
#EVALUATION FOR EMERGENCY PLANNING OF HAZARDS FROM	ACCIDENTS INVOLVING STOCKS OF RADIOACTIVE MATERIALS*	005430 P 2
PLANT. II* #THE MAXIMUM PERMISSIBLE	ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR	008708 P 2
STATIONS* #CONSEQUENCES OF	ACTIVITY RELEASE - WASTE MANAGEMENT AT NUCLEAR POWER	026177 P 6
TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES (	ADDENDUM 1 TO BRH/DER 70-21* #RADIOACTIVE WASTE DISCHARGES	028659 P 6
#N S SAVANNAH CHANGE 5 - MISC.	ADMINISTRATION AND TESTING*	014861 P 3
#TRITIUM	ADSORPTION FACILITY*	091611 P 24
#LOW-TEMPERATURE	ADSORPTION STUDIES FOR THE PSC REACTOR*	035393 P 7
#	AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS*	049348 P 11
HUNDREDFOLD* #	AEC LOWERING PLANT RADIOACTIVE EMISSIONS CEILING A	065152 P 14
GASES IN THE REPROCESSING #AKUT - A PROCESS FOR SEPARATING	AEROSOLS, KRYPTON AND TRITIUM FROM THE COMBUSTION WASTE	087422 P 23
FUEL REPROCESSING* #AKUT: A PROCESS FOR THE SEPARATION OF	AEROSOLS, KRYPTON, AND TRITIUM FROM BURNER OFF-GAS IN HTR-	098138 P 26
#BIOLOGICAL IMPLICATIONS OF THE NUCLEAR	AGE*	044674 P 9
#THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST	AIR FROM A NUCLEAR PLANT. II*	008708 P 2
TRITIUM FROM THE COMBUSTION WASTE GASES IN THE #	AKUT - A PROCESS FOR SEPARATING AEROSOLS, KRYPTON AND	087422 P 23
AND TRITIUM FROM BURNER OFF-GAS IN HTR-FUEL REPROCESSING* #	AKUT: A PROCESS FOR THE SEPARATION OF AEROSOLS, KRYPTON,	098138 P 26
OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS	ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31, 1972*	082903 P 22
#REMOVAL OF CS-137 FROM	ALKALINE CONDENSATE WASTES*	031408 P 7
ATMOSPHERE* #AN	APPARATUS FOR THE REDUCTION OF TRITIUM EMISSIONS INTO THE	083395 P 23
#ENVIRONMENTAL RADIATION DOSE COMMITMENT: AN	APPLICATION TO THE NUCLEAR POWER INDUSTRY*	090352 P 24
MATERIAL LICENSING REQUESTING CONSIDERATION OF CONSTRUCTION	APPLICATION* #LETTER, NFS TO DIVISION OF	041523 P 8
#ENVIRONMENTAL PROTECTION FOR NUCLEAR	APPLICATIONS*	061944 P 13
#SYMPOSIUM OF RADIOECOLOGY	APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT*	075576 P 19
ENDING DECEMBER 31, 1973* #	AQUEOUS FUEL REPROCESSING QUARTERLY REPORT FOR PERIOD	092494 P 25
#LIQUID WASTE MANAGEMENT AT THE NRTS TEST REACTOR	AREA*	075565 P 19
#HYDROLOGY OF RADIOACTIVE WASTE DISPOSAL IN THE HTR-ETR	AREA, NATIONAL REACTOR TESTING STATION, IDAHO.*	052442 P 12
INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE	AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH	082903 P 22
REDUCTION OF TRITIUM CONCENTRATION RELEASED TO UNRESTRICTED	AREAS* #	044916 P 9
#STATEMENT ON THE SELECTION OF	AS LOW AS PRACTICABLE DESIGN OBJECTIVE*	055028 P 12
#STATEMENT ON THE SELECTION OF AS LOW	AS PRACTICABLE DESIGN OBJECTIVE*	055028 P 12
ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* #SOME	ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE	075295 P 19
#CERTAIN ENVIRONMENTAL	ASPECTS OF TRITIUM*	082301 P 22
#REPROCESSING PROBLEMS	ASSOCIATED WITH THE INCREASING BURN-UP OF FUTURE FUELS*	036242 P 8
APPARATUS FOR THE REDUCTION OF TRITIUM EMISSIONS INTO THE	ATMOSPHERE* #AN	083395 P 23
#RADIOACTIVE WASTE FROM	ATOMIC POWER STATIONS*	028005 P 6
REPORT FOR THE PERIOD ENDING FEBRUARY 28, 1974 HTGR	BASE PROGRAM* #QUARTERLY PROGRESS	099345 P 26
EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY	BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL	043979 P 8
#NEED FOR	BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS*	067891 P 16
#MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED	BIBLIOGRAPHY*	082225 P 21
#	BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE*	044674 P 9
HEAT PIPES FOR RECOVERY OF TRITIUM IN THERMONUCLEAR REACTOR	BLANKETS* #	056882 P 12
ENVIRONMENT FROM NUCLEAR POWER FACILITIES (ADDENDUM 1 TO	BRH/DER 70-21* #RADIOACTIVE WASTE DISCHARGES TO THE	028659 P 6
INCORPORATED INTO GLASS* #THE SAFE	BURIAL OF HIGH-LEVEL FISSION PRODUCT SOLUTIONS	005341 P 1
* #LAND	BURIAL OF SOLID RADIOACTIVE WASTE DURING A TEN-YEAR PERIOD.	052245 P 12
#REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING	BURN-UP OF FUTURE FUELS*	036242 P 8
FOR THE SEPARATION OF AEROSOLS, KRYPTON, AND TRITIUM FROM	BURNER OFF-GAS IN HTR-FUEL REPROCESSING* #AKUT: A PROCESS	098138 P 26
POPULATION DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL #	CALCULATIONS OF ENVIRONMENTAL RADIATION EXPOSURES AND	080208 P 21
#TRITIUM RELEASE AT	CALVERT CLIFFS*	044106 P 8
AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN	CANADA* #SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY	075295 P 19
#AEC LOWERING PLANT RADIOACTIVE EMISSIONS	CEILING A HUNDREDFOLD*	065152 P 14
DURING PROCESSING OF THO2-UO2 FUELS* #HOT-	CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85	010702 P 3
#	CERTAIN ENVIRONMENTAL ASPECTS OF TRITIUM*	082301 P 22
#N S SAVANNAH	CHANGE 5 - MISC. ADMINISTRATION AND TESTING*	014861 P 3
WASTE DISPOSAL* #TECHNICAL SPECIFICATIONS	CHANGE 7, REVISIONS TO PROVIDE SPECIFIC LIMITS ON TRITIUM	012211 P 3
QUARTERLY REPORT, OCTOBER-DECEMBER 1973* #	CHEMICAL ENGINEERING DIVISION WASTE MANAGEMENT PROGRAMS	092526 P 25
#AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE	CLAIMS*	049348 P 11
#SPEECH BY	CLARENCE E. LARSON, COMMISSIONER, USAEC*	065420 P 15
#TRITIUM RELEASE AT CALVERT	CLIFFS*	044106 P 8
#NEED FOR BETTER INFORMATION ON EFFECTS OF	COASTAL REACTORS*	067891 P 16
FOR SEPARATING AEROSOLS, KRYPTON AND TRITIUM FROM THE	COMBUSTION WASTE GASES IN THE REPROCESSING OF HIGH	087422 P 23
#AEC	COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS*	049348 P 11
#SPEECH BY CLARENCE E. LARSON,	COMMISSIONER, USAEC*	065420 P 15
#ENVIRONMENTAL RADIATION DOSE	COMMITMENT: AN APPLICATION TO THE NUCLEAR POWER INDUSTRY*	090352 P 24
#REDUCTION OF TRITIUM	CONCENTRATION RELEASED TO UNRESTRICTED AREAS*	044916 P 9
#METHOD FOR REDUCTION OF TRITIUM VAPOR	CONCENTRATION*	044650 P 9
#REMOVAL OF CS-137 FROM ALKALINE	CONDENSATE WASTES*	031408 P 7
NUCLEAR POWER STATIONS* #	CONSEQUENCES OF ACTIVITY RELEASE - WASTE MANAGEMENT AT	026177 P 6
#LETTER, NFS TO DIVISION OF MATERIAL LICENSING REQUESTING	CONSIDERATION OF CONSTRUCTION APPLICATION*	041523 P 8
DIVISION OF MATERIAL LICENSING REQUESTING CONSIDERATION OF	CONSTRUCTION APPLICATION* #LETTER, NFS TO	041523 P 8

#THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. II* 008708 P 2
#DEEP-WELL DISPOSAL OF TRITIUM CONTAINING LIQUID EFFLUENTS* 074887 P 18
FORMATIONS* #REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL 081106 P 21
OF THE LITERATURE OF 1968 ON WASTEWATER AND WATERPOLLUTION CONTROL - INDUSTRIAL WASTE, RADIOACTIVE* #A REVIEW 047256 P 11
#QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.* 016512 P 4
#EFFLUENT CONTROL IN FUEL REPROCESSING PLANTS* 092495 P 25
DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES* #TRITIUM 089425 P 23
#TRITIUM CONTROL TECHNOLOGY* 094798 P 26
#NUCLEAR PLANT ENVIRONMENTAL CONTROL* 062381 P 14
#MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY* 082225 P 21
#ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON ENVIRONMENTAL QUALITY* 065195 P 15
#AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS* 049348 P 11
#REMOVAL OF CS-137 FROM ALKALINE CONDENSATE WASTES* 031408 P 7

OPERATIONS OFFICE* #RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION - IDAHO 035171 P 7
#RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION, IDAHO* 015822 P 4
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 27
DEEP-WELL DISPOSAL OF TRITIUM CONTAINING LIQUID EFFLUENTS* 074887 P 18
OF THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF-GAS SYSTEM DELAY SECTION* #HOLD-UP TIME 047086 P 10
#STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE* 055028 P 12
#NEW DESIGN SET IN NUCLEAR PLANT* 056491 P 12
#FISSION PRODUCT GAS RETENTION PROCESS AND EQUIPMENT DESIGN STUDY* 092493 P 24
#PWR PLANT LIMITED-RELEASE RADWASTE SYSTEM DESIGN* 069814 P 16
#DRY SITE RADWASTE SYSTEM DESIGN* 076844 P 20
#REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL FORMATIONS* 081106 P 21
MANAGEMENT PROGRAM - AN OVERVIEW FOR THE 1970S* #RECENT DEVELOPMENTS IN THE U.S. LOW-LEVEL RADIOACTIVE WASTE 062005 P 13
#ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 082903 P 22
IMPLICATIONS OF SOME LONG-LIVED FISSION PRODUCT NUCLIDES DISCHARGED TO THE ENVIRONMENT IN FUEL REPROCESSING WASTES* 074877 P 18
#ESTIMATION OF TRITIUM DISCHARGES INTO LLW-STREAMS* 072213 P 17
#EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* 048899 P 11
REPROCESSING PLANT* #RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM A NUCLEAR FUEL 066059 P 16
FACILITIES (ADDENDUM 1 TO BRH/DER 70-21* #RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER 028659 P 6
#MCBRIDE DISCUSSES FUEL REPROCESSING* 045016 P 10
IDAHO OPERATIONS OFFICE* #RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION - 035171 P 7
IDAHO* #RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION, 015822 P 4
#OFF-GAS TREATMENT AND KRYPTON DISPOSAL IN HTGR-FUEL ELEMENT REPROCESSING* 074881 P 18
STATION, IDAHO.* #HYDROLOGY OF RADIOACTIVE WASTE DISPOSAL IN THE MTR-ETR AREA, NATIONAL REACTOR TESTING 052442 P 12
#STATUS OF RADIOACTIVE WASTE DISPOSAL IN U.S.A.* 057309 P 13
#EARTH SCIENCES WASTE DISPOSAL INVESTIGATIONS, JULY--DECEMBER 1966* 021290 P 5
DISPOSAL OF RADIOACTIVE GASES FROM NUCLEAR INSTALLATIONS* 079774 P 20
NATURAL GAS WELLS#PRELIMINARY EVALUATION OF METHODS FOR THE DISPOSAL OF TRITIATED WATER FROM NUCLEARLY STIMULATED 080812 P 21
#DEEP-WELL DISPOSAL OF TRITIUM CONTAINING LIQUID EFFLUENTS* 074887 P 18
#MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY* 082225 P 21
#GROUND WASTE DISPOSAL PRACTICES AT THE SAVANNAH RIVER PLANT* 028836 P 6
#SOLVING THE WASTE DISPOSAL PROBLEM* 017550 P 4
1964* #WASTE TREATMENT AND DISPOSAL QUARTERLY PROGRESS REPORT NOVEMBER 1963-JANUARY 005350 P 1
#WASTE TREATMENT AND DISPOSAI SEMIANNUAL PROGRESS REPORT, JULY-DECEMBER 1966* 021930 P 5
#WASTE DISPOSAL* 006781 P 2
7, REVISIONS TO PROVIDE SPECIFIC LIMITS ON TRITIUM WASTE DISPOSAL* #TECHNICAL SPECIFICATIONS CHANGE 012211 P 3
PROGRESS REPORT, 1962.* #HYDROLOGY OF WASTE DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO. ANNUAL 053071 P 12
PROGRESS REPORT, 1963* #HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL 008330 P 2
FOR CONTROL STRATEGIES* #TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS 089425 P 23
CONSTRUCTION APPLICATION* #LETTER, NFS TO DIVISION OF MATERIAL LICENSING REQUESTING CONSIDERATION OF 041523 P 8
OCTOBER-DECEMBER 1973* #CHEMICAL ENGINEERING DIVISION WASTE MANAGEMENT PROGRAMS QUARTERLY REPORT, 092526 P 25
INDUSTRY* #ENVIRONMENTAL RADIATION DOSE COMMITMENT: AN APPLICATION TO THE NUCLEAR POWER 090352 P 24
PLANT* #GENERAL ENVIRONMENTAL DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING 077136 P 20
OF ENVIRONMENTAL RADIATION EXPOSURES AND POPULATION DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING 080208 P 21
DRY SITE RADWASTE SYSTEM DESIGN* 076844 P 20
#GENERAL ENVIRONMENTAL DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT* 077136 P 20
OF ENVIRONMENTAL RADIATION EXPOSURES AND POPULATION DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT* 080208 P 21
#LAND BURIAL OF SOLID RADIOACTIVE WASTE DURING A TEN-YEAR PERIOD.* 052245 P 12
#ENVIRONMENTAL PROTECTION DURING FUEL PROCESSING* 072709 P 17
CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS* #HOT- 010702 P 3

#SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC* 065420 P 15
DECEMBER 1966* # EARTH SCIENCES WASTE DISPOSAL INVESTIGATIONS, JULY-- 021290 P 5
#PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES* 065087 P 14
DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 # ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE 082903 P 22
OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS 043979 P 8
#NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 16
JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE 043979 P 8
ON LAKE MICHIGAN* # EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES 048899 P 11
EFFLUENT CONTROL IN FUEL REPROCESSING PLANTS* 092495 P 25
#REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT* 074952 P 19
RADIATION EXPOSURES AND POPULATION DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT* 080208 P 21
#GENERAL ENVIRONMENTAL DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT* 077136 P 20
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 13
#DEEP-WELL DISPOSAL OF TRITIUM CONTAINING LIQUID EFFLUENTS* 074887 P 18
EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY 043979 P 8
#OFF-GAS TREATMENT AND KRYPTON DISPOSAL IN HTGR-FUEL ELEMENT REPROCESSING* 074881 P 18
WASTE GASES IN THE REPROCESSING OF HIGH TEMPERATURE FUEL ELEMENTS*AEROSOLS, KRYPTON AND TRITIUM FROM THE COMBUSTION 087422 P 23
STOCKS OF RADIOACTIVE MATERIALS* #EVALUATION FOR EMERGENCY PLANNING OF HAZARDS FROM ACCIDENTS INVOLVING 005430 P 2

#AEC LOWERING PLANT RADIOACTIVE	EMISSIONS CEILING A HUNDREDFOLD*	065152 P 14
#AN APPARATUS FOR THE REDUCTION OF TRITIUM	EMISSIONS INTO THE ATMOSPHERE*	083395 P 23
#AQUEOUS FUEL REPROCESSING QUARTERLY REPORT FOR PERIOD	ENDING DECEMBER 31, 1973*	092494 P 25
#QUARTERLY PROGRESS REPORT FOR THE PERIOD	ENDING FEBRUARY 28, 1974 HTGR BASE PROGRAM*	099345 P 26
#RADIOACTIVE WASTE DISCHARGES TO THE	ENVIRONMENT FROM A NUCLEAR FUEL REPROCESSING PLANT*	066059 P 16
BRH/DER 70-21* #RADIOACTIVE WASTE DISCHARGES TO THE	ENVIRONMENT FROM NUCLEAR POWER FACILITIES (ADDENDUM 1 TO	028659 P 6
ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE	ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* #SOME	075295 P 19
SOME LONG-LIVED FISSION PRODUCT NUCLIDES DISCHARGED TO THE	ENVIRONMENT IN FUEL REPROCESSING WASTES* IMPLICATIONS OF	074877 P 18
#IRRADIATED FUEL REPROCESSING AND THE	ENVIRONMENT*	044972 P 9
OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS	ENVIRONMENT* #SYMPOSIUM	075576 P 19
#CERTAIN	ENVIRONMENTAL ASPECTS OF TRITIUM*	082301 P 22
#NUCLEAR PLANT	ENVIRONMENTAL CONTROL*	062381 P 14
REPROCESSING PLANT* #GENERAL	ENVIRONMENTAL DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL	077136 P 20
TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* #	ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS --	043979 P 8
#	ENVIRONMENTAL PROTECTION DURING FUEL PROCESSING*	072709 P 17
0	ENVIRONMENTAL PROTECTION FOR NUCLEAR APPLICATIONS*	061944 P 13
#ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON	ENVIRONMENTAL QUALITY*	065195 P 15
ENVIRONMENTAL QUALITY* #	ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON	065195 P 15
THE NUCLEAR POWER INDUSTRY* #	ENVIRONMENTAL RADIATION DOSE COMMITMENT: AN APPLICATION TO	090352 P 24
TO EFFLUENTS FROM A NUCLEAR FUEL #CALCULATIONS OF	ENVIRONMENTAL RADIATION EXPOSURES AND POPULATION DOSES DUE	080208 P 21
#	ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS*	065953 P 16
#FISSION PRODUCT GAS RETENTION PROCESS AND	EQUIPMENT DESIGN STUDY*	092493 P 24
#WESTINGHOUSE OFFERS SYSTEMS FOR	ESSENTIALLY ZERO RELEASE OF RADWASTE*	045009 P 10
#	ESTIMATION OF TRITIUM DISCHARGES INTO LLW-STREAMS*	072213 P 17
#HYDROLOGY OF RADIOACTIVE WASTE DISPOSAL IN THE HTR-	ETR AREA, NATIONAL REACTOR TESTING STATION, IDAHO.*	052442 P 12
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN	EUROPE*	072136 P 17
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN	EUROPE*	072593 P 17
ACCIDENTS INVOLVING STOCKS OF RADIOACTIVE MATERIALS* #	EVALUATION FOR EMERGENCY PLANNING OF HAZARDS FROM	005430 P 2
FROM NUCLEARLY STIMULATED NATURAL GAS WELLS* #PRELIMINARY	EVALUATION OF METHODS FOR THE DISPOSAL OF TRITIATED WATER	080812 P 21
PROCESSING OF THO2-UO2 FUELS* #HOT-CELL	EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING	010702 P 3
#THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE	EXHAUST AIR FROM A NUCLEAR PLANT. II*	008708 P 2
#REDUCTION OF TRITIUM IN	EXHAUST STACK EFFLUENTS AT PINELLAS PLANT*	074952 P 19
RESEARCH REACTORS* #	EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX	004276 P 1
0TRITIUM	EXPOSURE AT TRACERLAB, JANUARY 10, 1966*	009022 P 3
POPULATION* #RADIATION	EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE	094095 P 25
NUCLEAR FUEL #CALCULATIONS OF ENVIRONMENTAL RADIATION	EXPOSURES AND POPULATION DOSES DUE TO EFFLUENTS FROM A	080208 P 21
WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER	FACILITIES (ADDENDUM 1 TO BRH/DER 70-2)* #RADIOACTIVE	028659 P 6
#TRITIUM ADSORPTION	FACILITY*	091611 P 24
#METHOD OF AND	FILTER FOR REMOVING TRITIUM FROM INERT GASES*	101060 P 27
#TREATMENT AND	FINAL STORAGE OF RADIOACTIVE RESIDUES*	036783 P 8
#ENVIRONMENTAL QUALITY,	FIRST ANNUAL REPORT OF COUNCIL ON ENVIRONMENTAL QUALITY*	065195 P 15
STUDY* #	FISSION PRODUCT GAS RETENTION PROCESS AND EQUIPMENT DESIGN	092493 P 24
#	FISSION PRODUCT GAS RETENTION STUDY*	086883 P 23
FUEL #THE FUTURE IMPLICATIONS OF SOME LONG-LIVED	FISSION PRODUCT NUCLIDES DISCHARGED TO THE ENVIRONMENT IN	074877 P 18
#THE SAFE BURIAL OF HIGH-LEVEL	FISSION PRODUCT SOLUTIONS INCORPORATED INTO GLASS*	005341 P 1
#MANAGEMENT OF	FISSION PRODUCT TRITIUM IN FUEL PROCESSING WASTES*	004978 P 1
#	FISSION PRODUCT TRITIUM IN FUEL REPROCESSING WASTES*	014871 P 3
#	FISSION-PRODUCT TRITIUM IN FUEL-PROCESSING WASTE*	004955 P 1
#THE TECHNOLOGY OF TRITIUM	FIXATION AND STORAGE*	089576 P 24
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-	FLUX RESEARCH REACTORS*	004276 P 1
GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL	FORMATIONS* #REDUCTION OF RADIOACTIVE	081106 P 21
#OFF-GAS TREATMENT AND KRYPTON DISPOSAL IN HTGR-	FUEL ELEMENT REPROCESSING*	074881 P 18
WASTE GASES IN THE REPROCESSING OF HIGH TEMPERATURE	FUEL ELEMENTS* KRYPTON AND TRITIUM FROM THE COMBUSTION	087422 P 23
#MANAGEMENT OF FISSION PRODUCT TRITIUM IN	FUEL PROCESSING WASTES*	004978 P 1
#ENVIRONMENTAL PROTECTION DURING	FUEL PROCESSING*	072709 P 17
#IRRADIATED	FUEL REPROCESSING AND THE ENVIRONMENT*	044972 P 9
GENERAL ENVIRONMENTAL DOSES DUE TO EFFLUENTS FROM A NUCLEAR	FUEL REPROCESSING PLANT* #	077136 P 20
WASTE DISCHARGES TO THE ENVIRONMENT FROM A NUCLEAR	FUEL REPROCESSING PLANT* #RADIOACTIVE	066059 P 16
AND POPULATION DOSES DUE TO EFFLUENTS FROM A NUCLEAR	FUEL REPROCESSING PLANT* ENVIRONMENTAL RADIATION EXPOSURES	080208 P 21
#EFFLUENT CONTROL IN	FUEL REPROCESSING PLANTS*	092495 P 25
DECEMBER 31, 1973* 0AQUEOUS	FUEL REPROCESSING QUARTERLY REPORT FOR PERIOD ENDING	092494 P 25
0MANAGEMENT OF	FUEL REPROCESSING WASTES IN JAPAN*	074874 P 18
#FISSION PRODUCT TRITIUM IN	FUEL REPROCESSING WASTES*	014871 P 3
FISSION PRODUCT NUCLIDES DISCHARGED TO THE ENVIRONMENT IN	FUEL REPROCESSING WASTES* IMPLICATIONS OF SOME LONG-LIVED	074877 P 18
#	FUEL REPROCESSING*	082317 P 22
#MCBRIDE DISCUSSES	FUEL REPROCESSING*	045016 P 10
AEROSOLS, KRYPTON, AND TRITIUM FROM BURNER OFF-GAS IN HTR-	FUEL REPROCESSING* #AKUT: A PROCESS FOR THE SEPARATION OF	098138 P 26
#FISSION-PRODUCT TRITIUM IN	FUEL-PROCESSING WASTE*	007955 P 1
PROBLEMS ASSOCIATED WITH THE INCREASING BURN-UP OF FUTURE	FUELS* #REPROCESSING	036242 P 8
OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2	FUELS* #HOT-CELL EVALUATION OF THE RELEASE	010702 P 3
#RADIOACTIVE WASTES FROM	FUSION REACTORS.*	053739 P 12
PROBLEMS ASSOCIATED WITH THE INCREASING BURN-UP OF	FUTURE FUELS* #REPROCESSING	036242 P 8
#	FUTURE GOALS IN RADIOACTIVE WASTE MANAGEMENT*	062009 P 14
NUCLIDES DISCHARGED TO THE ENVIRONMENT IN FUEL #THE	FUTURE IMPLICATIONS OF SOME LONG-LIVED FISSION PRODUCT	074877 P 18
FORMATIONS* #REDUCTION OF RADIOACTIVE	GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL	081106 P 21
OF AEROSOLS, KRYPTON, AND TRITIUM FROM BURNER OFF-	GAS IN HTR-FUEL REPROCESSING* A PROCESS FOR THE SEPARATION	098138 P 26
#FISSION PRODUCT	GAS RETENTION PROCESS AND EQUIPMENT DESIGN STUDY*	092493 P 24
#FISSION PRODUCT	GAS RETENTION STUDY*	086883 P 23
#HOLD-UP TIME OF THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF-	GAS SYSTEM DELAY SECTION*	047086 P 10
REPROCESSING* #OFF-	GAS TREATMENT AND KRYPTON DISPOSAL IN HTGR-FUEL ELEMENT	074881 P 18

OF TRITIATED WATER FROM NUCLEARLY STIMULATED NATURAL GAS WELLS* EVALUATION OF METHODS FOR THE DISPOSAL 080812 P 21
#HOLD-UP TIME OF THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF-GAS SYSTEM DELAY SECTION* 047086 P 10
#DISPOSAL OF RADIOACTIVE GASES FROM NUCLEAR INSTALLATIONS* 079774 P 20
AEROSOLS, KRYPTON AND TRITIUM FROM THE COMBUSTION WASTE GASES IN THE REPROCESSING OF HIGH TEMPERATURE FUEL ELEMENTS 087422 P 23
#METHOD OF AND FILTER FOR REMOVING TRITIUM FROM INERT GASES* 101060 P 27
#TRITIUM REMOVAL FROM GASES* 016014 P 4
NUCLEAR FUEL REPROCESSING PLANT* # GENERAL ENVIRONMENTAL DOSES DUE TO EFFLUENTS FROM A 077136 P 20
RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. 043979 P 8
OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL FORMATIONS* #REDUCTION 081106 P 21
MANAGEMENT* # GEOLOGY PLAYS AN IMPORTANT ROLE IN RADIOACTIVE WASTE 049247 P 11
OF HIGH-LEVEL FISSION PRODUCT SOLUTIONS INCORPORATED INTO GLASS* #THE SAFE BURIAL 005341 P 1
#FUTURE GOALS IN RADIOACTIVE WASTE MANAGEMENT* 062009 P 14
* # GROUND WASTE DISPOSAL PRACTICES AT THE SAVANNAH RIVER PLANT 028836 P 6

MATERIALS* #EVALUATION FOR EMERGENCY PLANNING OF HAZARDS FROM ACCIDENTS INVOLVING STOCKS OF RADIOACTIVE 005430 P 2
REACTOR BLANKETS* # HEAT PIPES FOR RECOVERY OF TRITIUM IN THERMONUCLEAR 056882 P 12
#SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* 075295 P 19
FROM THE COMBUSTION WASTE GASES IN THE REPROCESSING OF HIGH TEMPERATURE FUEL ELEMENTS* KRYPTON AND TRITIUM 087422 P 23
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* 004276 P 1
GLASS* #THE SAFE BURIAL OF HIGH-LEVEL FISSION PRODUCT SOLUTIONS INCORPORATED INTO 005341 P 1
OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT* #SYMPOSIUM 075576 P 19
GAS SYSTEM DELAY SECTION* # HOLD-UP TIME OF THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF- 047086 P 10
85 DURING PROCESSING OF THO2-UO2 FUELS* # HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON- 010702 P 3
PROGRESS REPORT FOR THE PERIOD ENDING FEBRUARY 28, 1974 HTGR BASE PROGRAM* #QUARTERLY 099345 P 26
#OFF-GAS TREATMENT AND KRYPTON DISPOSAL IN HTGR-FUEL ELEMENT REPROCESSING* 074881 P 18
OF AEROSOLS, KRYPTON, AND TRITIUM FROM BURNER OFF-GAS IN HTR-FUEL REPROCESSING* #AKUT: A PROCESS FOR THE SEPARATION 098138 P 26
#AEC LOWERING PLANT RADIOACTIVE EMISSIONS CEILING A HUNDREDFOLD* 065152 P 14
AREA, NATIONAL REACTOR TESTING STATION, IDAHO.* # HYDROLOGY OF RADIOACTIVE WASTE DISPOSAL IN THE MTR-ETR 052442 P 12
TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963* # HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR 008330 P 2
1966* # HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 023297 P 5
STATION, IDAHO. ANNUAL PROGRESS REPORT, 1962.* # HYDROLOGY OF WASTE DISPOSAL. NATIONAL REACTOR TESTING 053071 P 12

DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION - IDAHO OPERATIONS OFFICE* #RADIOACTIVE WASTE 035171 P 7
DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION, IDAHO* #RADIOACTIVE WASTE 015822 P 4
OF WASTE DISPOSAL. NATIONAL REACTOR TESTING STATION, IDAHO. ANNUAL PROGRESS REPORT, 1962.* #HYDROLOGY 053071 P 12
IN THE MTR-ETR AREA, NATIONAL REACTOR TESTING STATION, IDAHO.* #HYDROLOGY OF RADIOACTIVE WASTE DISPOSAL 052442 P 12
WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO. ANNUAL PROGRESS REPORT, 1963* OF SUBSURFACE 008330 P 2
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966* 023297 P 5
DISCHARGED TO THE ENVIRONMENT IN FUEL #THE FUTURE IMPLICATIONS OF SOME LONG-LIVED FISSION PRODUCT NUCLIDES 074877 P 18
#BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE* 044674 P 9
#GEOLOGY PLAYS AN IMPORTANT ROLE IN RADIOACTIVE WASTE MANAGEMENT* 049247 P 11
#THE SAFE BURIAL OF HIGH-LEVEL FISSION PRODUCT SOLUTIONS INCORPORATED INTO GLASS* 005341 P 1
#REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING BURN-UP OF FUTURE FUELS* 036242 P 8
OF 1968 ON WASTEWATER AND WATERPOLLUTION CONTROL - INDUSTRIAL WASTE, RADIOACTIVE* #A REVIEW OF THE LITERATURE 047256 P 11
#TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES* 089425 P 23
#AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS* 049348 P 11
DOSE COMMITMENT: AN APPLICATION TO THE NUCLEAR POWER INDUSTRY* #ENVIRONMENTAL RADIATION 090352 P 24
#METHOD OF AND FILTER FOR REMOVING TRITIUM FROM INERT GASES* 101060 P 27
#NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 16
#DISPOSAL OF RADIOACTIVE GASES FROM NUCLEAR INSTALLATIONS* 079774 P 20
#SELECTED ITEMS OF INTEREST* 046465 P 10
BURIAL OF HIGH-LEVEL FISSION PRODUCT SOLUTIONS INCORPORATED INTO GLASS* #THE SAFE 005341 P 1
#ESTIMATION OF TRITIUM DISCHARGES INTO LLW-STREAMS* 072213 P 17
#AN APPARATUS FOR THE REDUCTION OF TRITIUM EMISSIONS INTO THE ATMOSPHERE* 083395 P 23
AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE 082903 P 22
#EARTH SCIENCES WASTE DISPOSAL INVESTIGATIONS, JULY--DECEMBER 1966* 021290 P 5
EVALUATION FOR EMERGENCY PLANNING OF HAZARDS FROM ACCIDENTS INVOLVING STOCKS OF RADIOACTIVE MATERIALS* # 005430 P 2
IRRADIATED FUEL REPROCESSING AND THE ENVIRONMENT* 044972 P 9
#SELECTED ITEMS OF INTEREST* 046465 P 10

#MANAGEMENT OF FUEL REPROCESSING WASTES IN JAPAN* 074874 P 18
EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL 043979 P 8
#EARTH SCIENCES WASTE DISPOSAL INVESTIGATIONS, JULY--DECEMBER 1966* 021290 P 5
#WASTE TREATMENT AND DISPOSAL SEMIANNUAL PROGRESS REPORT, JULY-DECEMBER 1966* 021930 P 5

#PUBLIC ACCEPTANCE NO PROBLEM IN UNITED KINGDOM* 065374 P 15
REPROCESSING OF #AKUT - A PROCESS FOR SEPARATING AEROSOLS, KRYPTON AND TRITIUM FROM THE COMBUSTION WASTE GASES IN THE 087422 P 23
#OFF-GAS TREATMENT AND KRYPTON DISPOSAL IN HTGR-FUEL ELEMENT REPROCESSING* 074881 P 18
#HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS* 010702 P 3
#AKUT: A PROCESS FOR THE SEPARATION OF AEROSOLS, KRYPTON, AND TRITIUM FROM BURNER OFF-GAS IN HTR-FUEL 098138 P 26

#PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES* 065087 P 14
OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* #EFFECTS 048899 P 11

PERIOD.* # LAND BURIAL OF SOLID RADIOACTIVE WASTE DURING A TEN-YEAR 052245 P 12
#SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC* 065420 P 15
CONSIDERATION OF CONSTRUCTION APPLICATION* # LETTER, NFS TO DIVISION OF MATERIAL LICENSING REQUESTING 041523 P 8
#THE SAFE BURIAL OF HIGH- LEVEL FISSION PRODUCT SOLUTIONS INCORPORATED INTO GLASS* 005341 P 1
FOR THE 1970S* #RECENT DEVELOPMENTS IN THE U.S. LOW- LEVEL RADIOACTIVE WASTE MANAGEMENT PROGRAM - AN OVERVIEW 062005 P 13
APPLICATION* #LETTER, NFS TO DIVISION OF MATERIAL LICENSING REQUESTING CONSIDERATION OF CONSTRUCTION 041523 P 8
#PWR PLANT LIMITED-RELEASE RADWASTE SYSTEM DESIGN* 069814 P 16
SPECIFICATIONS CHANGE 7, REVISIONS TO PROVIDE SPECIFIC LIMITS ON TRITIUM WASTE DISPOSAL* #TECHNICAL 012211 P 3
#DEEP-WELL DISPOSAL OF TRITIUM CONTAINING LIQUID EFFLUENTS* 074887 P 18
#EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* 048899 P 11
LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 13
LIQUID WASTE MANAGEMENT AT THE NRTS TEST REACTOR AREA* 075565 P 19
CONTROL - INDUSTRIAL WASTE, RADIOACTIVE* #A REVIEW OF THE LITERATURE OF 1968 ON WASTEWATER AND WATERPOLLUTION 047256 P 11
ENVIRONMENT IN FUEL #THE FUTURE IMPLICATIONS OF SOME LONG- LIVED FISSION PRODUCT NUCLIDES DISCHARGED TO THE 074877 P 18
#ESTIMATION OF TRITIUM DISCHARGES INTO LLW-STREAMS* 072213 P 17
ENVIRONMENT IN FUEL #THE FUTURE IMPLICATIONS OF SOME LONG-LIVED FISSION PRODUCT NUCLIDES DISCHARGED TO THE 074877 P 18
OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972 THROUGH MARCH 31, 082903 P 22
#STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE* 055028 P 12
OVERVIEW FOR THE 1970S* #RECENT DEVELOPMENTS IN THE U.S. LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT PROGRAM - AN 062005 P 13
LOW-TEMPERATURE ADSORPTION STUDIES FOR THE PSC REACTOR* 035393 P 7
#AEC LOWERING PLANT RADIOACTIVE EMISSIONS CEILING A HUNDREDFOLD* 065152 P 14

#MAN- MADE TRITIUM* 077193 P 20
#PROGRESS REPORT OF THE MAIN STUDIES UP TO JANUARY 1, 1969* 049452 P 11
#SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT* 075576 P 19
MAN-MADE TRITIUM* 077193 P 20
#WASTE MANAGEMENT AT NUCLEAR POWER STATIONS* 029033 P 7
#CONSEQUENCES OF ACTIVITY RELEASE - WASTE MANAGEMENT AT NUCLEAR POWER STATIONS* 026177 P 6
#LIQUID WASTE MANAGEMENT AT THE NRTS TEST REACTOR AREA* 075565 P 19
WASTES* # MANAGEMENT OF FISSION PRODUCT TRITIUM IN FUEL PROCESSING 004978 P 1
MANAGEMENT OF FUEL REPROCESSING WASTES IN JAPAN* 074874 P 18
MANAGEMENT OF RADIOACTIVE WASTES AT NUCLEAR POWER STATIONS* 022928 P 5
MANAGEMENT OF RADIOACTIVE WASTES* 082318 P 22
#QUARTERLY PROGRESS REPORT - STUDIES ON MANAGEMENT OF SELECTED WASTES, JANUARY THROUGH MARCH 1974* 094858 P 26
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072136 P 17
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072593 P 17
RECENT DEVELOPMENTS IN THE U.S. LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT PROGRAM - AN OVERVIEW FOR THE 1970S* # 062005 P 13
* #CHEMICAL ENGINEERING DIVISION WASTE MANAGEMENT PROGRAMS QUARTERLY REPORT, OCTOBER-DECEMBER 1973 092526 P 25
#WASTE MANAGEMENT RESEARCH ABSTRACTS NO. 2* 019813 P 4
#FUTURE GOALS IN RADIOACTIVE WASTE MANAGEMENT* 062009 P 14
#WASTE MANAGEMENT* 075626 P 20
#GEOLOGY PLAYS AN IMPORTANT ROLE IN RADIOACTIVE WASTE MANAGEMENT* 049247 P 11
CONSTRUCTION APPLICATION* #LETTER, NFS TO DIVISION OF MATERIAL LICENSING REQUESTING CONSIDERATION OF 041523 P 8
PERIOD JULY 1, #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE 082903 P 22
OF HAZARDS FROM ACCIDENTS INVOLVING STOCKS OF RADIOACTIVE MATERIALS* #EVALUATION FOR EMERGENCY PLANNING 005430 P 2
FROM A NUCLEAR PLANT. II* #THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR 008708 P 2
MCBRIDE DISCUSSES FUEL REPROCESSING* 045016 P 10
METHOD FOR REDUCTION OF TRITIUM VAPOR CONCENTRATION* 044650 P 9
METHOD OF AND FILTER FOR REMOVING TRITIUM FROM INERT GASES* 101060 P 27
STIMULATED NATURAL GAS WELLS* #PRELIMINARY EVALUATION OF METHODS FOR THE DISPOSAL OF TRITIATED WATER FROM NUCLEARLY 080812 P 21
OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* #EFFECTS 048899 P 11
#N S SAVANNAH CHANGE 5 - MISC. ADMINISTRATION AND TESTING* 014861 P 3
#HOLD-UP TIME OF THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF-GAS SYSTEM DELAY SECTION* 047086 P 10
BIBLIOGRAPHY* # MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED 082225 P 21
#UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE SHAFTS* 083190 P 23
#HYDROLOGY OF RADIOACTIVE WASTE DISPOSAL IN THE MTR-ETR AREA, NATIONAL REACTOR TESTING STATION, IDAHO.* 052442 P 12

#RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION - IDAHO OPERATIONS OFFICE* 035171 P 7
REPORT, 1962.* #HYDROLOGY OF WASTE DISPOSAL. NATIONAL REACTOR TESTING STATION, IDAHO. ANNUAL PROGRESS 053071 P 12
OF RADIOACTIVE WASTE DISPOSAL IN THE MTR-ETR AREA, NATIONAL REACTOR TESTING STATION, IDAHO.* #HYDROLOGY 052442 P 12
#RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION, IDAHO* 015822 P 4
REPORT, 1963* #HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS 008330 P 2
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966* 023297 P 5
THE DISPOSAL OF TRITIATED WATER FROM NUCLEARLY STIMULATED NATURAL GAS WELLS* #PRELIMINARY EVALUATION OF METHODS FOR 080812 P 21
NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 16
NEW DESIGN SET IN NUCLEAR PLANT* 056491 P 12
NEWS RELEASES, USAEC* 065656 P 15
CONSIDERATION OF CONSTRUCTION APPLICATION* #LETTER, NFS TO DIVISION OF MATERIAL LICENSING REQUESTING 041523 P 8
#PUBLIC ACCEPTANCE NO PROBLEM IN UNITED KINGDOM* 065374 P 15
SCIENCES* #PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC 065087 P 14
#LIQUID WASTE MANAGEMENT AT THE NRTS TEST REACTOR AREA* 075565 P 19
#BIOLOGICAL IMPLICATIONS OF THE NUCLEAR AGE* 044674 P 9
#ENVIRONMENTAL PROTECTION FOR NUCLEAR APPLICATIONS* 061944 P 13
#REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL FORMATIONS* 081106 P 21
#RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM A NUCLEAR FUEL REPROCESSING PLANT* 066059 P 16
#GENERAL ENVIRONMENTAL DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT* 077136 P 20
EXPOSURES AND POPULATION DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT*OF ENVIRONMENTAL RADIATION 080208 P 21
#TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES* 089425 P 23
#DISPOSAL OF RADIOACTIVE GASES FROM NUCLEAR INSTALLATIONS* 079774 P 20
NUCLEAR PLANT ENVIRONMENTAL CONTROL* 062381 P 14
PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. II* #THE MAXIMUM 008708 P 2
#NEW DESIGN SET IN NUCLEAR PLANT* 056491 P 12

#RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES (ADDENDUM 1 TO BRH/DER 70-2)* 028659 P 6
RADIATION DOSE COMMITMENT: AN APPLICATION TO THE NUCLEAR POWER INDUSTRY* #ENVIRONMENTAL 090352 P 24
#RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION* 094095 P 25
MICHIGAN* #EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE 048899 P 11
#CONSEQUENCES OF ACTIVITY RELEASE - WASTE MANAGEMENT AT NUCLEAR POWER STATIONS* 026177 P 6
#MANAGEMENT OF RADIOACTIVE WASTES AT NUCLEAR POWER STATIONS* 022928 P 5
#WASTE MANAGEMENT AT NUCLEAR POWER STATIONS* 029033 P 7
RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* #SOME ASPECTS OF THE 075295 P 19
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 13
OF METHODS FOR THE DISPOSAL OF TRITIATED WATER FROM NUCLEARLY STIMULATED NATURAL GAS WELLS* EVALUATION 080812 P 21
#THE FUTURE IMPLICATIONS OF SOME LONG-LIVED FISSION PRODUCT NUCLIDES DISCHARGED TO THE ENVIRONMENT IN FUEL 074877 P 18

#STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE* 055028 P 12
DIVISION WASTE MANAGEMENT PROGRAMS QUARTERLY REPORT, OCTOBER-DECEMBER 1973* #CHEMICAL ENGINEERING 092526 P 25
SEPARATION OF AEROSOLS, KRYPTON, AND TRITIUM FROM BURNER OFF-GAS IN HTR-FUEL REPROCESSING* #AKUT: A PROCESS FOR THE 098138 P 26
#HOLD-UP TIME OF THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF-GAS SYSTEM DELAY SECTION* 047086 P 10
ELEMENT REPROCESSING* # OFF-GAS TREATMENT AND KRYPTON DISPOSAL IN HTGR-FUEL 074881 P 18
#QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.* 016512 P 4
#WESTINGHOUSE OFFERS SYSTEMS FOR ESSENTIALLY ZERO RELEASE OF RADWASTE* 045009 P 10
FOR THE NATIONAL REACTOR TESTING STATION - IDAHO OPERATIONS OFFICE* #RADIOACTIVE WASTE DISPOSAL DATA 035171 P 7
#QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.* 016512 P 4
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* 004276 P 1
DATA FOR THE NATIONAL REACTOR TESTING STATION - IDAHO OPERATIONS OFFICE* #RADIOACTIVE WASTE DISPOSAL 035171 P 7
#RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION* 094095 P 25
U.S. LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT PROGRAM - AN OVERVIEW FOR THE 1970S* #RECENT DEVELOPMENTS IN THE 062005 P 13

GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC 043979 P 8
ECOLOGIC SCIENCES* # PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, 065087 P 14
#LAND BURIAL OF SOLID RADIOACTIVE WASTE DURING A TEN-YEAR PERIOD.* 052245 P 12
NUCLEAR PLANT. II* #THE MAXIMUM PERMISSIBLE ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A 008708 P 2
#QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.* 016512 P 4
#REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT* 074952 P 19
BLANKETS* #HEAT PIPES FOR RECOVERY OF TRITIUM IN THERMONUCLEAR REACTOR 056882 P 12
RADIOACTIVE MATERIALS* #EVALUATION FOR EMERGENCY PLANNING OF HAZARDS FROM ACCIDENTS INVOLVING STOCKS OF 005430 P 2
#NUCLEAR PLANT ENVIRONMENTAL CONTROL* 062381 P 14
#PWR PLANT LIMITED-RELEASE RADWASTE SYSTEM DESIGN* 069814 P 16
#AEC LOWERING PLANT RADIOACTIVE EMISSIONS CEILING A HUNDREDFOLD* 065152 P 14
#NEW DESIGN SET IN NUCLEAR PLANT* 056491 P 12
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 13
#GROUND WASTE DISPOSAL PRACTICES AT THE SAVANNAH RIVER PLANT* 028836 P 6
REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT* # 074952 P 19
DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT* #GENERAL ENVIRONMENTAL 077136 P 20
TO THE ENVIRONMENT FROM A NUCLEAR FUEL REPROCESSING PLANT* #RADIOACTIVE WASTE DISCHARGES 066059 P 16
DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT* OF ENVIRONMENTAL RADIATION EXPOSURES AND POPULATION 080208 P 21
ACTIVITY CONTAINED IN THE EXHAUST AIR FROM A NUCLEAR PLANT. II* #THE MAXIMUM PERMISSIBLE 008708 P 2
#ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* 043979 P 8
#EFFLUENT CONTROL IN FUEL REPROCESSING PLANTS* 092495 P 25
#GEOLOGY PLAYS AN IMPORTANT ROLE IN RADIOACTIVE WASTE MANAGEMENT* 049247 P 11
#CALCULATIONS OF ENVIRONMENTAL RADIATION EXPOSURES AND POPULATION DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL 080208 P 21
EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION* #RADIATION 094095 P 25
WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES (ADDENDUM 1 TO BRH/DER 70-2)* #RADIOACTIVE 028659 P 6
RADIATION DOSE COMMITMENT: AN APPLICATION TO THE NUCLEAR POWER INDUSTRY* #ENVIRONMENTAL 090352 P 24
#RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION* 094095 P 25
#EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* 048899 P 11
#RADIOACTIVE WASTE FROM ATOMIC POWER STATIONS* 028005 P 6
#WASTE MANAGEMENT AT NUCLEAR POWER STATIONS* 029033 P 7
#MANAGEMENT OF RADIOACTIVE WASTES AT NUCLEAR POWER STATIONS* 022928 P 5
OF ACTIVITY RELEASE - WASTE MANAGEMENT AT NUCLEAR POWER STATIONS* #CONSEQUENCES 026177 P 6
#STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE* 055028 P 12
#GROUND WASTE DISPOSAL PRACTICES AT THE SAVANNAH RIVER PLANT* 028836 P 6
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072136 P 17
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072593 P 17
TRITIATED WATER FROM NUCLEARLY STIMULATED NATURAL GAS WELLS# PRELIMINARY EVALUATION OF METHODS FOR THE DISPOSAL OF 080812 P 21
#ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS* 065953 P 16
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 27
#PUBLIC ACCEPTANCE NO PROBLEM IN UNITED KINGDOM* 065374 P 15
#SOLVING THE WASTE DISPOSAL PROBLEM* 017550 P 4
FUELS* #REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING BURN-UP OF FUTURE 036242 P 8
#FISSION PRODUCT GAS RETENTION PROCESS AND EQUIPMENT DESIGN STUDY* 092493 P 24
THE COMBUSTION WASTE GASES IN THE REPROCESSING OF #AKUT - A PROCESS FOR SEPARATING AEROSOLS, KRYPTON AND TRITIUM FROM 087422 P 23
TRITIUM FROM BURNER OFF-GAS IN HTR-FUEL #AKUT: A PROCESS FOR THE SEPARATION OF AEROSOLS, KRYPTON, AND 098138 P 26
EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS* #HOT-CELL 010702 P 3
#FISSION-PRODUCT TRITIUM IN FUEL- PROCESSING WASTE* 004955 P 1
#MANAGEMENT OF FISSION PRODUCT TRITIUM IN FUEL PROCESSING WASTES* 004978 P 1
#ENVIRONMENTAL PROTECTION DURING FUEL PROCESSING* 072709 P 17
#FISSION PRODUCT GAS RETENTION PROCESS AND EQUIPMENT DESIGN STUDY* 092493 P 24
#FISSION PRODUCT GAS RETENTION STUDY* 086883 P 23
#THE FUTURE IMPLICATIONS OF SOME LONG-LIVED FISSION PRODUCT NUCLIDES DISCHARGED TO THE ENVIRONMENT IN FUEL 074877 P 18
#THE SAFE BURIAL OF HIGH-LEVEL FISSION PRODUCT SOLUTIONS INCORPORATED INTO GLASS* 005341 P 1
#MANAGEMENT OF FISSION PRODUCT TRITIUM IN FUEL PROCESSING WASTES* 004978 P 1
#FISSION PRODUCT TRITIUM IN FUEL REPROCESSING WASTES* 014871 P 3
#FISSION- PRODUCT TRITIUM IN FUEL-PROCESSING WASTE* 004955 P 1

#CHEMICAL ENGINEERING DIVISION WASTE MANAGEMENT PROGRAMS QUARTERLY REPORT, OCTOBER-DECEMBER 1973* 092526 P 25
#ENVIRONMENTAL PROTECTION DURING FUEL PROCESSING* 072709 P 17
#ENVIRONMENTAL PROTECTION FOR NUCLEAR APPLICATIONS* 061944 P 13
#SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT* 075576 P 19
#TECHNICAL SPECIFICATIONS CHANGE 7, REVISIONS TO PROVIDE SPECIFIC LIMITS ON TRITIUM WASTE DISPOSAL* 012211 P 3
#LOW-TEMPERATURE ADSORPTION STUDIES FOR THE PSC REACTOR* 035393 P 7
PUBLIC ACCEPTANCE NO PROBLEM IN UNITED KINGDOM* 065374 P 15
PWR PLANT LIMITED-RELEASE RADWASTE SYSTEM DESIGN* 069814 P 16

QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON ENVIRONMENTAL QUALITY* #ENVIRONMENTAL 065195 P 15
QUALITY* #ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT OF COUNCIL ON ENVIRONMENTAL 065195 P 15
PERSONNEL.* # QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF-SITE 016512 P 4

GENERATING PLANTS -- TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD* #ENVIRONMENTAL EFFECTS OF ELECTRIC 043979 P 8
POWER INDUSTRY* #ENVIRONMENTAL RADIATION DOSE COMMITMENT: AN APPLICATION TO THE NUCLEAR 090352 P 24
THE POPULATION* # RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND 094095 P 25
FROM A NUCLEAR FUEL #CALCULATIONS OF ENVIRONMENTAL RADIATION EXPOSURES AND POPULATION DOSES DUE TO EFFLUENTS 080208 P 21
#ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS* 065953 P 16
#AEC LOWERING PLANT RADIOACTIVE EMISSIONS CEILING A HUNDREDFOLD* 065152 P 14
GEOLOGICAL FORMATIONS* #REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN 081106 P 21
SECTION* #HOLD-UP TIME OF THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF-GAS SYSTEM DELAY 047086 P 10
#DISPOSAL OF RADIOACTIVE GASES FROM NUCLEAR INSTALLATIONS* 079774 P 20
ALAMOS FOR THE PERIOD JULY 1, #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS 082903 P 22
PLANNING OF HAZARDS FROM ACCIDENTS INVOLVING STOCKS OF RADIOACTIVE MATERIALS* #EVALUATION FOR EMERGENCY 005430 P 2
#TREATMENT AND FINAL STORAGE OF RADIOACTIVE RESIDUES* 036783 P 8
NUCLEAR POWER FACILITIES (ADDENDUM 1 TO BRH/DER 70-21* # RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM 028659 P 6
NUCLEAR FUEL REPROCESSING PLANT* # RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM A 066059 P 16
TESTING STATION - IDAHO OPERATIONS OFFICE* # RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR 035171 P 7
TESTING STATION, IDAHO* # RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR 015822 P 4
REACTOR TESTING STATION, IDAHO.* #HYDROLOGY OF RADIOACTIVE WASTE DISPOSAL IN THE MTR-ETR AREA, NATIONAL 052442 P 12
#STATUS OF RADIOACTIVE WASTE DISPOSAL IN U.S.A.* 057309 P 13
#LAND BURIAL OF SOLID RADIOACTIVE WASTE DURING A TEN-YEAR PERIOD.* 052245 P 12
RADIOACTIVE WASTE FROM ATOMIC POWER STATIONS* 028005 P 6
RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072136 P 17
RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072593 P 17
1970S* #RECENT DEVELOPMENTS IN THE U.S. LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT PROGRAM - AN OVERVIEW FOR THE 062005 P 13
#GEOLOGY PLAYS AN IMPORTANT ROLE IN RADIOACTIVE WASTE MANAGEMENT* 049247 P 11
#FUTURE GOALS IN RADIOACTIVE WASTE MANAGEMENT* 062009 P 14
#MANAGEMENT OF RADIOACTIVE WASTES AT NUCLEAR POWER STATIONS* 022928 P 5
RADIOACTIVE WASTES FROM FUSION REACTORS.* 053739 P 12
#MANAGEMENT OF RADIOACTIVE WASTES* 082318 P 22
WASTEWATER AND WATERPOLLUTION CONTROL - INDUSTRIAL WASTE, RADIOACTIVE* #A REVIEW OF THE LITERATURE OF 1968 ON 047256 P 11
REACTORS IN CANADA* #SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR 075295 P 19
ENVIRONMENT* #SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS 075576 P 19
#AEC COMMISSIONER CRITICIZES INDUSTRY ON RADWASTE CLAIMS* 049348 P 11
#DRY SITE RADWASTE SYSTEM DESIGN* 076844 P 20
#PWR PLANT LIMITED-RELEASE RADWASTE SYSTEM DESIGN* 069814 P 16
WESTINGHOUSE OFFERS SYSTEMS FOR ESSENTIALLY ZERO RELEASE OF RADWASTE* # 045009 P 10
#LIQUID WASTE MANAGEMENT AT THE NRTS TEST REACTOR AREA* 075565 P 19
#HEAT PIPES FOR RECOVERY OF TRITIUM IN THERMONUCLEAR REACTOR BLANKETS* 056882 P 12
#RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION - IDAHO OPERATIONS OFFICE* 035171 P 7
1962.* #HYDROLOGY OF WASTE DISPOSAL. NATIONAL REACTOR TESTING STATION, IDAHO. ANNUAL PROGRESS REPORT, 053071 P 12
OF RADIOACTIVE WASTE DISPOSAL IN THE MTR-ETR AREA, NATIONAL REACTOR TESTING STATION, IDAHO.* #HYDROLOGY 052442 P 12
#RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION, IDAHO* 015822 P 4
1963* #HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 008330 P 2
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966* 023297 P 5
#LOW-TEMPERATURE ADSORPTION STUDIES FOR THE PSC REACTOR* 035393 P 7
#RADIATION EXPOSURE OVERVIEW - NUCLEAR POWER REACTORS AND THE POPULATION* 094095 P 25
OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* #SOME ASPECTS OF THE RELEASES 075295 P 19
#NEED FOR BETTER INFORMATION ON EFFECTS OF COASTAL REACTORS* 067891 P 16
#ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS* 065953 P 16
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 27
OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* #EXPERIENCE 004276 P 1
#RADIOACTIVE WASTES FROM FUSION REACTORS.* 053739 P 12
WASTE MANAGEMENT PROGRAM - AN OVERVIEW FOR THE 1970S* # RECENT DEVELOPMENTS IN THE U.S. LOW-LEVEL RADIOACTIVE 062005 P 13
#HEAT PIPES FOR RECOVERY OF TRITIUM IN THERMONUCLEAR REACTOR BLANKETS* 056882 P 12
DETONATIONS IN GEOLOGICAL FORMATIONS* # REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR 081106 P 21
UNRESTRICTED AREAS* # REDUCTION OF TRITIUM CONCENTRATION RELEASED TO 044916 P 9
#AN APPARATUS FOR THE REDUCTION OF TRITIUM EMISSIONS INTO THE ATMOSPHERE* 083395 P 23
PINELLAS PLANT* # REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT 074952 P 19
#METHOD FOR REDUCTION OF TRITIUM VAPOR CONCENTRATION* 044650 P 9
#CONSEQUENCES OF ACTIVITY RELEASE - WASTE MANAGEMENT AT NUCLEAR POWER STATIONS* 026177 P 6
#TRITIUM RELEASE AT CALVERT CLIFFS* 044116 P 8
#WESTINGHOUSE OFFERS SYSTEMS FOR ESSENTIALLY ZERO RELEASE OF RADWASTE* 045009 P 10
THO2-UO2 FUELS* #HOT-CELL EVALUATION OF THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF 010702 P 3
#PWR PLANT LIMITED- RELEASE RADWASTE SYSTEM DESIGN* 069814 P 16
#REDUCTION OF TRITIUM CONCENTRATION RELEASED TO UNRESTRICTED AREAS* 044916 P 9
NUCLEAR REACTORS IN CANADA* #SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO THE ENVIRONMENT FROM 075295 P 19
#NEWS RELEASES, USAEC* 065656 P 15
#TRITIUM REMOVAL FROM GASES* 016014 P 4
REMOVAL OF CS-137 FROM ALKALINE CONDENSATE WASTES* 031408 P 7
#METHOD OF AND FILTER FOR REMOVING TRITIUM FROM INERT GASES* 101060 P 27

#WASTE TREATMENT AND DISPOSAL SEMIANNUAL PROGRESS REPORT, JULY-DECEMBER 1966* 021930 P 5
ENGINEERING DIVISION WASTE MANAGEMENT PROGRAMS QUARTERLY REPORT, OCTOBER-DECEMBER 1973* #CHEMICAL 092526 P 25
NATIONAL REACTOR TESTING STATION, IDAHO. ANNUAL PROGRESS REPORT, 1962.* #HYDROLOGY OF WASTE DISPOSAL. 053071 P 12
NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963* #HYDROLOGY OF SUBSURFACE WATER DISPOSAL, 008330 P 2
#IRRADIATED FUEL REPROCESSING AND THE ENVIRONMENT* 044972 P 9
KRYPTON AND TRITIUM FROM THE COMBUSTION WASTE GASES IN THE REPROCESSING OF HIGH TEMPERATURE FUEL ELEMENTS* AEROSOLS, 087422 P 23
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 13
ENVIRONMENTAL DOSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT* #GENERAL 077136 P 20
WASTE DISCHARGES TO THE ENVIRONMENT FROM A NUCLEAR FUEL REPROCESSING PLANT* #RADIOACTIVE 066059 P 16
AND POPULATION COSES DUE TO EFFLUENTS FROM A NUCLEAR FUEL REPROCESSING PLANT* OF ENVIRONMENTAL RADIATION EXPOSURES 080208 P 21
#EFFLUENT CONTROL IN FUEL REPROCESSING PLANTS* 092495 P 25
UP OF FUTURE FUELS* # REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING BURN- 036242 P 8
31, 1973* #AQUEOUS FUEL REPROCESSING QUARTERLY REPORT FOR PERIOD ENDING DECEMBER 092494 P 25
#MANAGEMENT OF FUEL REPROCESSING WASTES IN JAPAN* 074874 P 18
#FISSION PRODUCT TRITIUM IN FUEL REPROCESSING WASTES* 014871 P 3
PRODUCT NUCLIDES DISCHARGED TO THE ENVIRONMENT IN FUEL REPROCESSING WASTES* OF SOME LONG-LIVED FISSION 074877 P 18
#FUEL REPROCESSING* 082317 P 22
#MCBRIDE DISCUSSES FUEL REPROCESSING* 045016 P 10
OFF-GAS TREATMENT AND KRYPTON DISPOSAL IN HTGR-FUEL ELEMENT REPROCESSING* # 074881 P 18
KRYPTON, AND TRITIUM FROM BURNER OFF-GAS IN HTR-FUEL REPROCESSING* A PROCESS FOR THE SEPARATION OF AEROSOLS, 098138 P 26
#LETTER, NFS TO DIVISION OF MATERIAL LICENSING REQUESTING CONSIDERATION OF CONSTRUCTION APPLICATION* 041523 P 8
#TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES* 089425 P 23
#WASTE MANAGEMENT RESEARCH ABSTRACTS NO. 2* 019813 P 4
#EXPERIENCE OF OPERATION AND USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS* 004276 P 1
#TREATMENT AND FINAL STORAGE OF RADIOACTIVE RESIDUES* 036783 P 8
#FISSION PRODUCT GAS RETENTION PROCESS AND EQUIPMENT DESIGN STUDY* 092493 P 24
#FISSION PRODUCT GAS RETENTION STUDY* 086883 P 23
WATERPOLLUTION CONTROL - INDUSTRIAL WASTE, RADIOACTIVE* #A REVIEW OF THE LITERATURE OF 1968 ON WASTEWATER AND 047256 P 11
DISPOSAL* #TECHNICAL SPECIFICATIONS CHANGE 7, REVISIONS TO PROVIDE SPECIFIC LIMITS ON TRITIUM WASTE 012211 P 3
#GROUND WASTE DISPOSAL PRACTICES AT THE SAVANNAH RIVER PLANT* 028836 P 6
#GEOLOGY PLAYS AN IMPORTANT ROLE IN RADIOACTIVE WASTE MANAGEMENT* 049247 P 11

INCORPORATED INTO GLASS* #THE SAFE BURIAL OF HIGH-LEVEL FISSION PRODUCT SOLUTIONS 005341 P 1
#N S SAVANNAH CHANGE 5 - MISC. ADMINISTRATION AND TESTING* 014861 P 3
#GROUND WASTE DISPOSAL PRACTICES AT THE SAVANNAH RIVER PLANT* 028836 P 6
* #EARTH SCIENCES WASTE DISPOSAL INVESTIGATIONS, JULY--DECEMBER 1966 021290 P 5
NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES* #PACIFIC 065087 P 14
THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF-GAS SYSTEM DELAY SECTION* #HOLD-UP TIME OF 047086 P 10
#MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY* 082225 P 21
SELECTED ITEMS OF INTEREST* 046465 P 10
#QUARTERLY PROGRESS REPORT - STUDIES ON MANAGEMENT OF SELECTED WASTES, JANUARY THROUGH MARCH 1974* 094858 P 26
#STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN OBJECTIVE* 055028 P 12
#WASTE TREATMENT AND DISPOSAL SEMIANNUAL PROGRESS REPORT, JULY-DECEMBER 1966* 021930 P 5
COMBUSTION WASTE GASES IN THE #AKUT - A PROCESS FOR SEPARATING AEROSOLS, KRYPTON AND TRITIUM FROM THE 087422 P 23
OFF-GAS IN HTR-FUEL REPROCESSING* #AKUT: A PROCESS FOR THE SEPARATION OF AEROSOLS, KRYPTON, AND TRITIUM FROM BURNER 098138 P 26
#NEW DESIGN SET IN NUCLEAR PLANT* 056491 P 12
#UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE SHAFTS* 083190 P 23
#QUESTION 15 - TRITIUM CONTROL FOR ON- SITE AND OFF-SITE PERSONNEL.* 016512 P 4
#QUESTION 15 - TRITIUM CONTROL FOR ON-SITE AND OFF- SITE PERSONNEL.* 016512 P 4
#DRY SITE RADWASTE SYSTEM DESIGN* 076844 P 20
#LAND BURIAL OF SOLID RADIOACTIVE WASTE DURING A TEN-YEAR PERIOD.* 052245 P 12
#UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE SHAFTS* 083190 P 23
#THE SAFE BURIAL OF HIGH-LEVEL FISSION PRODUCT SOLUTIONS INCORPORATED INTO GLASS* 005341 P 1
SOLVING THE WASTE DISPOSAL PROBLEM* 017550 P 4
THE ENVIRONMENT FROM NUCLEAR REACTORS IN CANADA* # SOME ASPECTS OF THE RELEASES OF RADIOACTIVITY AND HEAT TO 075295 P 19
ENVIRONMENT IN FUEL #THE FUTURE IMPLICATIONS OF SOME LONG-LIVED FISSION PRODUCT NUCLIDES DISCHARGED TO THE 074877 P 18
REACTORS* # SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER 099746 P 27
#TECHNICAL SPECIFICATIONS CHANGE 7, REVISIONS TO PROVIDE SPECIFIC LIMITS ON TRITIUM WASTE DISPOSAL* 012211 P 3
LIMITS ON TRITIUM WASTE DISPOSAL* #TECHNICAL SPECIFICATIONS CHANGE 7, REVISIONS TO PROVIDE SPECIFIC 012211 P 3
SPEECH BY CLARENCE E. LARSON, COMMISSIONER, USAEC* 065420 P 15
#REDUCTION OF TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT* 074952 P 19
OBJECTIVE* # STATEMENT ON THE SELECTION OF AS LOW AS PRACTICABLE DESIGN 055028 P 12
WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION - IDAHO OPERATIONS OFFICE* #RADIOACTIVE 035171 P 7
#HYDROLOGY OF WASTE DISPOSAL. NATIONAL REACTOR TESTING STATION, IDAHO. ANNUAL PROGRESS REPORT, 1962.* 053071 P 12
DISPOSAL IN THE MTR-ETR AREA, NATIONAL REACTOR TESTING STATION, IDAHO.* #HYDROLOGY OF RADIOACTIVE WASTE 052442 P 12
WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING STATION, IDAHO* #RADIOACTIVE 015822 P 4
OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963* #HYDROLOGY 008330 P 2
#HYDROLOGY OF THE NATIONAL REACTOR TESTING STATION, IDAHO, 1966* 023297 P 5
#EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* 048899 P 11
#RADIOACTIVE WASTE FROM ATOMIC POWER STATIONS* 028005 P 6
#WASTE MANAGEMENT AT NUCLEAR POWER STATIONS* 029033 P 7
#MANAGEMENT OF RADIOACTIVE WASTES AT NUCLEAR POWER STATIONS* 022928 P 5
OF ACTIVITY RELEASE - WASTE MANAGEMENT AT NUCLEAR POWER STATIONS* #CONSEQUENCES 026177 P 6
STATUS OF RADIOACTIVE WASTE DISPOSAL IN U.S.A.* 057309 P 13
METHODS FOR THE DISPOSAL OF TRITIATED WATER FROM NUCLEARLY STIMULATED NATURAL GAS WELLS* #PRELIMINARY EVALUATION OF 080812 P 21
FOR EMERGENCY PLANNING OF HAZARDS FROM ACCIDENTS INVOLVING STOCKS OF RADIOACTIVE MATERIALS* #EVALUATION 005430 P 2
#TREATMENT AND FINAL STORAGE OF RADIOACTIVE RESIDUES* 036783 P 8
#UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE SHAFTS* 083190 P 23
#THE TECHNOLOGY OF TRITIUM FIXATION AND STORAGE* 089576 P 24
IN THE NUCLEAR INDUSTRY - THE REQUIREMENTS FOR CONTROL STRATEGIES* #TRITIUM DISTRIBUTION 089425 P 23
#ESTIMATION OF TRITIUM DISCHARGES INTO LLW- STREAMS* 072213 P 17
#LOW-TEMPERATURE ADSORPTION STUDIES FOR THE PSC REACTOR* 035393 P 7
MARCH 1974* #QUARTERLY PROGRESS REPORT - STUDIES ON MANAGEMENT OF SELECTED WASTES, JANUARY THROUGH 094858 P 26
#PROGRESS REPORT OF THE MAIN STUDIES UP TO JANUARY 1, 1969* 049452 P 11
#FISSION PRODUCT GAS RETENTION PROCESS AND EQUIPMENT DESIGN STUDY* 092493 P 24

#FISSION PRODUCT GAS RETENTION	STUDY*	086883 P 23
STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963* #HYDROLOGY OF	SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING	008330 P 2
AND HIS ENVIRONMENT*	# SYMPOSIUM OF RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN	075576 P 19
UP TIME OF THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF-GAS	SYSTEM DELAY SECTION* #HOLD-	047086 P 10
#PWR PLANT LIMITED-RELEASE RADWASTE	SYSTEM DESIGN*	069814 P 16
#DRY SITE RADWASTE	SYSTEM DESIGN*	076844 P 20
#WESTINGHOUSE OFFERS	SYSTEMS FOR ESSENTIALLY ZERO RELEASE OF RADWASTE*	045009 P 10
#THE	TECHNOLOGY OF TRITIUM FIXATION AND STORAGE*	089576 P 24
#TRITIUM CONTROL	TECHNOLOGY*	094798 P 26
#LOW-	TEMPERATURE ADSORPTION STUDIES FOR THE PSC REACTOR*	035393 P 7
FROM THE COMBUSTION WASTE GASES IN THE REPROCESSING OF HIGH	TEMPERATURE FUEL ELEMENTS* AEROSOLS, KRYPTON AND TRITIUM	087422 P 23
#LAND BURIAL OF SOLID RADIOACTIVE WASTE DURING A	TEN-YEAR PERIOD.*	052245 P 12
#SOURCE	TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS*	099746 P 27
#LIQUID WASTE MANAGEMENT AT THE NRTS	TEST REACTOR AREA*	075565 P 19
#ENVIRONMENTAL EFFECTS OF ELECTRIC GENERATING PLANTS --	TESTIMONY BEFORE JCAE BY EDWARD P. RADFORD*	043979 P 8
#RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR	TESTING STATION - IDAHO OPERATIONS OFFICE*	035171 P 7
#HYDROLOGY OF WASTE DISPOSAL. NATIONAL REACTOR	TESTING STATION, IDAHO. ANNUAL PROGRESS REPORT, 1962.*	053071 P 12
WASTE DISPOSAL IN THE MTR-ETR AREA, NATIONAL REACTOR	TESTING STATION, IDAHO.* #HYDROLOGY OF RADIOACTIVE	052442 P 12
#RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR	TESTING STATION, IDAHO*	015822 P 4
#HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR	TESTING STATION, IDAHO, ANNUAL PROGRESS REPORT, 1963*	008330 P 2
#HYDROLOGY OF THE NATIONAL REACTOR	TESTING STATION, IDAHO, 1966*	023297 P 5
#N S SAVANNAH CHANGE 5 - MISC. ADMINISTRATION AND	TESTING*	014861 P 3
#HEAT PIPES FOR RECOVERY OF TRITIUM IN	THERMONUCLEAR REACTOR BLANKETS*	056882 P 12
THE RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF	THO2-UO2 FUELS* #HOT-CELL EVALUATION OF	010702 P 3
REPORT - STUDIES ON MANAGEMENT OF SELECTED WASTES, JANUARY	THROUGH MARCH 1974* #QUARTERLY PROGRESS	094858 P 26
DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 1972	THROUGH MARCH 31, 1972* OF RADIOACTIVE MATERIALS IN WASTE	082903 P 27
SYSTEM DELAY SECTION* #HOLD-UP	TIME OF THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF-GAS	047086 P 10
#TRITIUM EXPOSURE AT	TRACERLAB, JANUARY 10, 1966*	009022 P 3
1963-JANUARY 1964* #WASTE	TREATMENT AND DISPOSAL QUARTERLY PROGRESS REPORT NOVEMBER	005350 P 1
DECEMBER 1966* #WASTE	TREATMENT AND DISPOSAL SEMIANNUAL PROGRESS REPORT, JULY-	021930 P 5
#	TREATMENT AND FINAL STORAGE OF RADIOACTIVE RESIDUES*	036783 P 8
REPROCESSING* #OFF-GAS	TREATMENT AND KRYPTON DISPOSAL IN HTGR-FUEL ELEMENT	074881 P 18
* #PRELIMINARY EVALUATION OF METHODS FOR THE DISPOSAL OF	TRITIATED WATER FROM NUCLEARLY STIMULATED NATURAL GAS WELLS	080812 P 21
#	TRITIUM ADSORPTION FACILITY*	091611 P 24
#HOT-CELL EVALUATION OF THE RELEASE OF	TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-UO2 FUELS*	010702 P 3
#REDUCTION OF	TRITIUM CONCENTRATION RELEASED TO UNRESTRICTED AREAS*	044916 P 9
#DEEP-WELL DISPOSAL OF	TRITIUM CONTAINING LIQUID EFFLUENTS*	074887 P 18
#QUESTION 15 -	TRITIUM CONTROL FOR ON-SITE AND OFF-SITE PERSONNEL.*	016512 P 4
#	TRITIUM CONTROL TECHNOLOGY*	094798 P 26
#ESTIMATION OF	TRITIUM DISCHARGES INTO LLW-STREAMS*	072213 P 17
REQUIREMENTS FOR CONTROL STRATEGIES* #	TRITIUM DISTRIBUTION IN THE NUCLEAR INDUSTRY - THE	089425 P 23
#AN APPARATUS FOR THE REDUCTION OF	TRITIUM EMISSIONS INTO THE ATMOSPHERE*	083395 P 23
#	TRITIUM EXPOSURE AT TRACERLAB, JANUARY 10, 1966*	009022 P 3
#THE TECHNOLOGY OF	TRITIUM FIXATION AND STORAGE*	089576 P 24
A PROCESS FOR THE SEPARATION OF AEROSOLS, KRYPTON, AND	TRITIUM FROM BURNER OFF-GAS IN HTR-FUEL REPROCESSING*AKUT:	098138 P 26
#METHOD OF AND FILTER FOR REMOVING	TRITIUM FROM INERT GASES*	101060 P 27
#UNDERGROUND MOVEMENT OF	TRITIUM FROM SOLID-WASTE STORAGE SHAFTS*	083190 P 23
#AKUT - A PROCESS FOR SEPARATING AEROSOLS, KRYPTON AND	TRITIUM FROM THE COMBUSTION WASTE GASES IN THE	087422 P 23
#REDUCTION OF	TRITIUM IN EXHAUST STACK EFFLUENTS AT PINELLAS PLANT*	074952 P 19
#MANAGEMENT OF FISSION PRODUCT	TRITIUM IN FUEL PROCESSING WASTES*	004978 P 1
#FISSION PRODUCT	TRITIUM IN FUEL REPROCESSING WASTES*	014871 P 3
#FISSION-PRODUCT	TRITIUM IN FUEL-PROCESSING WASTE*	004955 P 1
#HEAT PIPES FOR RECOVERY OF	TRITIUM IN THERMONUCLEAR REACTOR BLANKETS*	056882 P 12
#	TRITIUM RELEASE AT CALVERT CLIFFS*	044106 P 8
#	TRITIUM REMOVAL FROM GASES*	016014 P 4
#METHOD FOR REDUCTION OF	TRITIUM VAPOR CONCENTRATION*	044650 P 9
CHANGE 7, REVISIONS TO PROVIDE SPECIFIC LIMITS ON	TRITIUM WASTE DISPOSAL* #TECHNICAL SPECIFICATIONS	012211 P 3
#CERTAIN ENVIRONMENTAL ASPECTS OF	TRITIUM*	082301 P 22
#MAN-MADE	TRITIUM*	077193 P 20
#MONITORING, CONTROL, AND DISPOSAL OF	TRITIUM. A SELECTED BIBLIOGRAPHY*	082225 P 21
#EXPERIENCE OF OPERATION AND USE OF THE	U.K. HIGH-FLUX RESEARCH REACTORS*	004276 P 1
OVERVIEW FOR THE 1970S* #RECENT DEVELOPMENTS IN THE	U.S. LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT PROGRAM - AN	062005 P 13
#STATUS OF RADIOACTIVE WASTE DISPOSAL IN	U.S.A.*	057309 P 13
SHAFTS* #	UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID-WASTE STORAGE	083190 P 23
#PUBLIC ACCEPTANCE NO PROBLEM IN	UNITED KINGDOM*	065374 P 15
#REDUCTION OF TRITIUM CONCENTRATION RELEASED TO	UNRESTRICTED AREAS*	044916 P 9
RELEASE OF TRITIUM AND KRYPTON-85 DURING PROCESSING OF THO2-	UO2 FUELS* #HOT-CELL EVALUATION OF THE	010702 P 3
#REPROCESSING PROBLEMS ASSOCIATED WITH THE INCREASING BURN-	UP OF FUTURE FUELS*	036242 P 8
SYSTEM DELAY SECTION* #HOLD-	UP TIME OF THE RADIOACTIVE GASEOUS MIXTURE IN THE OFF-GAS	047086 P 10
#PROGRESS REPORT OF THE MAIN STUDIES	UP TO JANUARY 1, 1969*	049452 P 11
#SPEECH BY CLARENCE E. LARSON, COMMISSIONER,	USAEC*	065420 P 15
#NEWS RELEASES,	USAEC*	065656 P 15
#EXPERIENCE OF OPERATION AND	USE OF THE U.K. HIGH-FLUX RESEARCH REACTORS*	004276 P 1
#IN THE	UTILITIES*	044068 P 8
#METHOD FOR REDUCTION OF TRITIUM	VAPOR CONCENTRATION*	044650 P 9

1972 #ECOLOGICAL INVESTIGATION OF RADIOACTIVE MATERIALS IN WASTE DISCHARGE AREAS AT LOS ALAMOS FOR THE PERIOD JULY 1, 082903 P 22
#EFFECTS OF NUCLEAR POWER STATIONS LIQUID WASTE DISCHARGES ON LAKE MICHIGAN* 048899 P 11
REPROCESSING PLANT* #RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM A NUCLEAR FUEL 066059 P 16
FACILITIES (ADDENDUM 1 TO BRH/DER 70-21* #RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER 028659 P 6
STATION - IDAHO OPERATIONS OFFICE* #RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING 035171 P 7
STATION, IDAHO* #RADIOACTIVE WASTE DISPOSAL DATA FOR THE NATIONAL REACTOR TESTING 015822 P 4
TESTING STATION, IDAHO.* #HYDROLOGY OF RADIOACTIVE WASTE DISPOSAL IN THE MTR-ETR AREA, NATIONAL REACTOR 052442 P 12
#STATUS OF RADIOACTIVE WASTE DISPOSAL IN U.S.A.* 057309 P 13
#EARTH SCIENCES WASTE DISPOSAL INVESTIGATIONS, JULY--DECEMBER 1966* 021290 P 5
#GROUND WASTE DISPOSAL PRACTICES AT THE SAVANNAH RIVER PLANT* 028836 P 6
#SOLVING THE WASTE DISPOSAL PROBLEM* 017550 P 4
ANNUAL PROGRESS REPORT, 1962.* #HYDROLOGY OF WASTE DISPOSAL. NATIONAL REACTOR TESTING STATION, IDAHO. 053071 P 12
WASTE DISPOSAL* 006781 P 2
CHANGE 7, REVISIONS TO PROVIDE SPECIFIC LIMITS ON TRITIUM WASTE DISPOSAL* #TECHNICAL SPECIFICATIONS 012211 P 3
#LAND BURIAL OF SOLID RADIOACTIVE WASTE DURING A TEN-YEAR PERIOD.* 052245 P 12
#LIQUID WASTE EFFLUENTS FROM A NUCLEAR REPROCESSING PLANT* 058861 P 13
#RADIOACTIVE WASTE FROM ATOMIC POWER STATIONS* 028005 P 6
AEROSOLS, KRYPTON AND TRITIUM FROM THE COMBUSTION WASTE GASES IN THE REPROCESSING OF HIGH TEMPERATURE FUEL 087422 P 23
#CONSEQUENCES OF ACTIVITY RELEASE - WASTE MANAGEMENT AT NUCLEAR POWER STATIONS* 026177 P 6
WASTE MANAGEMENT AT NUCLEAR POWER STATIONS* 029033 P 7
#LIQUID WASTE MANAGEMENT AT THE NRTS TEST REACTOR AREA* 075565 P 19
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072593 P 17
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072136 P 17
#RECENT DEVELOPMENTS IN THE U.S. LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT PROGRAM - AN OVERVIEW FOR THE 1970S* 062005 P 13
DECEMBER 1973* #CHEMICAL ENGINEERING DIVISION WASTE MANAGEMENT PROGRAMS QUARTERLY REPORT, OCTOBER- 092526 P 25
WASTE MANAGEMENT RESEARCH ABSTRACTS NO. 2* 019813 P 4
#FUTURE GOALS IN RADIOACTIVE WASTE MANAGEMENT* 062009 P 14
#GEOLOGY PLAYS AN IMPORTANT ROLE IN RADIOACTIVE WASTE MANAGEMENT* 049247 P 11
WASTE MANAGEMENT* 075626 P 20
#UNDERGROUND MOVEMENT OF TRITIUM FROM SOLID- WASTE STORAGE SHAFTS* 083190 P 23
NOVEMBER 1963-JANUARY 1964* # WASTE TREATMENT AND DISPOSAL QUARTERLY PROGRESS REPORT 005350 P 1
JULY-DECEMBER 1966* # WASTE TREATMENT AND DISPOSAL SEMIANNUAL PROGRESS REPORT, 021930 P 5
#FISSION-PRODUCT TRITIUM IN FUEL-PROCESSING WASTE* 004955 P 1
1968 ON WASTEWATER AND WATERPOLLUTION CONTROL - INDUSTRIAL WASTE, RADIOACTIVE* #A REVIEW OF THE LITERATURE OF 047256 P 11
#MANAGEMENT OF RADIOACTIVE WASTES AT NUCLEAR POWER STATIONS* 022928 P 5
#RADIOACTIVE WASTES FROM FUSION REACTORS.* 053739 P 12
#MANAGEMENT OF FUEL REPROCESSING WASTES IN JAPAN* 074874 P 18
#MANAGEMENT OF RADIOACTIVE WASTES* 082318 P 22
#FISSION PRODUCT TRITIUM IN FUEL REPROCESSING WASTES* 014871 P 3
#REMOVAL OF CS-137 FROM ALKALINE CONDENSATE WASTES* 031408 P 7
#MANAGEMENT OF FISSION PRODUCT TRITIUM IN FUEL PROCESSING WASTES* 004978 P 1
NUCLIDES DISCHARGED TO THE ENVIRONMENT IN FUEL REPROCESSING WASTES* IMPLICATIONS OF SOME LONG-LIVED FISSION PRODUCT 074877 P 18
PROGRESS REPORT - STUDIES ON MANAGEMENT OF SELECTED WASTES, JANUARY THROUGH MARCH 1974* #QUARTERLY 094858 P 26
RADIOACTIVE* #A REVIEW OF THE LITERATURE OF 1968 ON WASTEWATER AND WATERPOLLUTION CONTROL - INDUSTRIAL WASTE, 047256 P 11
ANNUAL PROGRESS REPORT, 1963* #HYDROLOGY OF SUBSURFACE WATER DISPOSAL, NATIONAL REACTOR TESTING STATION, IDAHO, 008330 P 2
EVALUATION OF METHODS FOR THE DISPOSAL OF TRITIATED WATER FROM NUCLEARLY STIMULATED NATURAL GAS WELLS* 080812 P 21
#ENVIRONMENTAL RADIATION FROM PRESSURIZED WATER REACTORS* 065953 P 16
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 27
#A REVIEW OF THE LITERATURE OF 1968 ON WASTEWATER AND WATERPOLLUTION CONTROL - INDUSTRIAL WASTE, RADIOACTIVE* 047256 P 11
#DEEP- WELL DISPOSAL OF TRITIUM CONTAINING LIQUID EFFLUENTS* 074887 P 18
OF TRITIATED WATER FROM NUCLEARLY STIMULATED NATURAL GAS WELLS* #PRELIMINARY EVALUATION OF METHODS FOR THE DISPOSAL 080812 P 21
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072136 P 17
#RADIOACTIVE WASTE MANAGEMENT PRACTICES IN WESTERN EUROPE* 072593 P 17
OF RADWASTE* # WESTINGHOUSE OFFERS SYSTEMS FOR ESSENTIALLY ZERO RELEASE 045009 P 10
#SOURCE TERM DATA FOR WESTINGHOUSE PRESSURIZED WATER REACTORS* 099746 P 27

#LAND BURIAL OF SOLID RADIOACTIVE WASTE DURING A TEN- YEAR PERIOD.* 052245 P 12

#WESTINGHOUSE OFFERS SYSTEMS FOR ESSENTIALLY ZERO RELEASE OF RADWASTE* 045009 P 10

IX Results of Environmental Monitoring

IX - RESULTS OF ENVIRONMENTAL MONITORING

004695
ADAMS PC + MEYER HE
ENVIRONMENTAL MONITORING SEMI-ANNUAL REPORT- JANUARY THROUGH JUNE, 1964
MONSANTO RESEARCH CORPORATION, MIAMISBURG, OHIO
16 PAGES, 3 TABLES- SEPTEMBER 11, 1964, MLM-1210- OTS

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO, DURING THE FIRST HALF OF 1964 IS PRESENTED. THE CONCENTRATION OF POLONIUM AND TRITIUM IN THE GREAT MIAMI RIVER WAS WITHIN THE MAXIMUM PERMISSIBLE LEVEL RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS. THE CONCENTRATION OF POLONIUM AND PLUTONIUM IN THE ENVIRONMENTAL AIR WAS ALSO WITHIN THE MAXIMUM PERMISSIBLE LEVEL RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS. THERE WAS NO DETECTABLE CONCENTRATION OF TRITIUM IN THE ENVIRONMENTAL AIR DURING THIS PERIOD.

*CRUSTACEAN + FALLOUT + MONITOR, LIQUID + PLUTONIUM + RIVER + SURVEY, ENVIRONMENT + WASTE DISPOSAL, ATMOSPHERIC + MONITOR, AIR + POLONIUM + *SURFACE WATER, NUCLIDE OCCURRENCE + WASTE DISPOSAL, RIVER + POPULATION EXPOSURE

004811
FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, ROBERT A. TAFT SANITARY ENGINEERING CENTER
33 PAGES, 23 FIGURES, 7 TABLES- 1960, SEC-TR R60-2 (A/AC.82/G/L 511) (TID-12884)- OTS

THIS REPORT ON WATER-BORNE RADIONUCLIDES RECORDS PROGRESS MADE IN FIVE SPECIFIC AREAS OF STUDY DURING THE SECOND YEAR OF THE PROJECT, COVERING THE PERIOD FROM MAY 1, 1958 TO JUNE 30, 1959. THE AREAS COVERED INCLUDE INSTRUMENTATION, TRITIUM, ESTUARINE AND MARINE WATERS, AQUATIC BIOTA, AND THE FATE OF RADIOACTIVE MATERIALS IN THE WATER ENVIRONMENT. DESCRIBED ARE SOME CHANGES MADE IN EXISTING COUNTING EQUIPMENT TO IMPROVE SENSITIVITY, PROGRESS MADE TO IMPROVE TRITIUM ANALYSES, IMPROVEMENTS IN ANALYSES OF RADIONUCLIDES IN SEA WATER, METHODS USED TO IDENTIFY RADIONUCLIDES ASSOCIATED WITH ALGAE, AND THE DEVELOPMENT OF STREAM SAMPLING DEVICES. RESULTS OF ANALYSES OF SAMPLES COLLECTED AT KAPL, SAVANNAH RIVER, AND SHIPPINGPORT ARE REPORTED.

CRUSTACEAN + CESIUM + ECOLOGY + *MONITOR, LIQUID + STRONTIUM + *SURVEY, ENVIRONMENT + *SURFACE WATER, NUCLIDE OCCURRENCE + *SURFACE WATER, SUSPENDED MATERIAL + RADIATION MONITORS

005143
RADIOLOGICAL HEALTH DATA, VOLUME IV, NUMBER 3
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
50 PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, 4(3)- 111-160 (MARCH 1963)- GPO

DATA ARE PRESENTED ON FISSION PRODUCT RADIOACTIVITY IN SAMPLES OF AIRBORNE PARTICULATES, PRECIPITATION, AND SURFACE WATER COLLECTED AT VARIOUS LOCATIONS THROUGHOUT THE U. S., CANADA, AND MEXICO DURING 1962. DATA ARE INCLUDED ON THE DAILY CONSUMPTION OF MILK, APPLES, LETTUCE, BEEF, AND WHITE BREAD BY SEX AND REGION THROUGHOUT THE U. S.- THE SR 90 CONTENT OF THE DIET IN SELECTED AREAS- AND THE SR 90 ACTIVITY IN U. S. SOIL AND WHEAT FROM 1958 THROUGH 1962. RESULTS ARE INCLUDED FROM A SURVEY OF SR 90 CONTENT IN THE DIET IN THE UNITED KINGDOM FROM 1958 THROUGH 1961. RESULTS ARE INCLUDED FROM THE ANALYSIS OF MILK SAMPLES COLLECTED THROUGHOUT THE U. S. AND CANADA DURING 1961 AND 1962 FOR FISSION PRODUCT ACTIVITY WITH EMPHASIS ON THE CONTENT OF SR 89, SR 90, AND I 131. ENVIRONMENTAL LEVELS OF RADIOACTIVITY DURING 1961 AND 1962 ARE REPORTED FOR THE FEED MATERIALS PRODUCTION CENTER, FERNALD, OHIO, AND THE MOUND LABORATORY, MIAMISBURG, OHIO. DATA ARE SUMMARIZED ON NUCLEAR DETONATIONS REPORTED DURING FEB. 1963.

BARIUM + CALCIUM + *CESIUM + ECOLOGY + *FALLOUT + *IODINE + MONITOR, LIQUID + *RAINOUT + *STRONTIUM + ATMOSPHERIC CIRCULATION + SURVEY, ENVIRONMENT + WASTE DISPOSAL, ATMOSPHERIC + ZIRCONIUM + AGRICULTURE + MONITOR, AIR + MONITOR, SOLID + POLONIUM + *SURFACE WATER, NUCLIDE OCCURRENCE + *SURVEY, USPHS + WASTE DISPOSAL, RIVER + *MILK + *DIETARY HABIT + FEED MATERIALS PRODUCTION CENTER + GROSS ALPHA + GROSS BETA + MOUND LABORATORY + NUCLEAR DETONATION + SURFACE WATER, DISPOSAL MEDIA + *CONCENTRATION + FOOD

005145
RADIOLOGICAL HEALTH DATA, VOLUME IV, NUMBER 5
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
50 PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, 4(5)- 225-274 (MAY 1963)- GPO

DATA ARE PRESENTED ON THE RADIOACTIVITY IN SAMPLES BY AIRBORNE PARTICULATES, PRECIPITATION, AND SURFACE WATERS COLLECTED THROUGHOUT THE U. S. AND OTHER LOCATIONS DURING 1962 AND 1963. DATA ARE INCLUDED ON THE CONTENT OF SR 89, SR 90, AND I 131 IN MILK SAMPLES FROM VARIOUS LOCATIONS, THE ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT ARGONNE NATIONAL LABORATORY AND THE PORTSMOUTH AREA GASEOUS DIFFUSION PLANT DURING 1962, AND THE SHIPPINGPORT ATOMIC POWER STATION DURING THE SECOND HALF OF 1961 AND THE FIRST HALF OF 1962. RESULTS ARE REPORTED FROM A SURVEY OF RADIOACTIVITY EMITTED BY LUMINOUS DIAL WATCHES. ONLY ONE NUCLEAR DETONATION WAS ANNOUNCED DURING APRIL 1963. CHARACTERISTICS OF THE DETONATION ARE SUMMARIZED.

BARIUM + CALCIUM + CERIUM + *CESIUM + COBALT + *FALLOUT + *IODINE + MONITOR, LIQUID + NIOBIUM + PLUTONIUM + *RAINOUT + RUTHENIUM + SHIPPINGPORT (PWR) + *STRONTIUM + SURVEY, ENVIRONMENT + THORIUM + URANIUM + WASTE DISPOSAL, ATMOSPHERIC + XENON + ZIRCONIUM + AGRICULTURE + MONITOR, AIR + MONITOR, SOLID + *SURFACE WATER, NUCLIDE OCCURRENCE + *SURVEY, USPHS + WASTE DISPOSAL, RIVER + ANL + *MILK + GROSS ALPHA + GROSS BETA + NUCLEAR DETONATION + PORTSMOUTH PLANT + PROTACTINIUM + SURFACE WATER, DISPOSAL MEDIA

005148
RADIOLOGICAL HEALTH DATA, VOLUME IV, NUMBER 8
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
37 PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, 4(8)- 391-427 (AUGUST 1963)- GPO

DATA ARE PRESENTED ON FISSION PRODUCT RADIOACTIVITY IN SAMPLES OF SURFACE AIR, PRECIPITATION, SURFACE WATERS, WATER SUPPLIES, AND MILK COLLECTED THROUGHOUT THE U. S. AND CANADA AND OTHER SELECTED SITES DURING 1962 AND 1963. AN ANALYSIS WAS MADE OF THE SR 90/CA RATIO IN INFANT AND ADULT DIETS AT NEW YORK CITY, CHICAGO, AND SAN FRANCISCO BETWEEN APRIL AND NOVEMBER, 1962. DATA ARE INCLUDED ON ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT THE SAVANNAH RIVER PLANT DURING 1962. RESULTS ARE REPORTED FROM WHOLE-BODY MEASUREMENTS OF CS 137 IN MAN MADE AT LANDSTUHL, GERMANY.

BARIUM + CALCIUM + *CESIUM + *FALLOUT + *IODINE + MONITOR, LIQUID + *RAINOUT + *STRONTIUM + SURVEY, ENVIRONMENT + WASTE DISPOSAL, ATMOSPHERIC + ZIRCONIUM + AGRICULTURE + MONITOR, AIR + MONITOR, SOLID + *SURFACE WATER, NUCLIDE OCCURRENCE + *SURVEY, USPHS + WASTE DISPOSAL, RIVER + *MILK + *DIETARY HABIT + WATER, DRINKING + GROSS ALPHA + GROSS BETA + GROSS GAMMA + RADIUM + SAVANNAH RIVER PLANT + SURFACE WATER, DISPOSAL MEDIA + COUNTER, WHOLE BODY + VEGETATION + CONCENTRATION + AQUATIC ORGANISM + FOOD

005154
RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 3
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
46 PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, 5(3)- 105-150 (MARCH 1964)- GPO

DATA ARE SUMMARIZED ON FISSION PRODUCT RADIOACTIVITY DUE TO FALLOUT IN SAMPLES OF AIRBORNE PARTICULATES AND PRECIPITATION COLLECTED THROUGHOUT THE U. S., CANADA, MEXICO, PAN AMERICA, AND ALONG THE 80TH MERIDIAN DURING OCTOBER, 1963. DATA ARE INCLUDED ON THE CONTENT OF SR 89, SR 90, AND CS 137 IN MILK SAMPLES COLLECTED THROUGHOUT THE U. S. DURING 1961, 1962, AND 1963- THE RADIOACTIVITY IN SURFACE WATERS IN 1963- THE RADIOACTIVITY OF DIETS SAMPLED DURING 1963- ON I 131 IN POST-MORTEM HUMAN THYROIDS- ON ANALYTICAL QUALITY CONTROL TECHNIQUES- AND ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT THE SHIPPINGPORT ATOMIC POWER STATION FROM JUNE 1962 TO JULY 1963. ONE LOW-INTERMEDIATE-YIELD UNDERGROUND NUCLEAR DETONATION AT THE NEVADA TEST SITE WAS REPORTED DURING FEBRUARY 1964. SEPARATE ABSTRACTS WERE PREPARED FOR TWO SECTIONS OF THIS REPORT.

BARIUM + CALCIUM + *CESIUM + *FALLOUT + *IODINE + MONITOR, LIQUID + *RAINOUT + SHIPPINGPORT (PWR) + *STRONTIUM + SURVEY, ENVIRONMENT + WASTE DISPOSAL, ATMOSPHERIC + XENON + AGRICULTURE + MONITOR, AIR + MONITOR, SOLID + PHOSPHORUS + POTASSIUM + *SURFACE WATER, NUCLIDE OCCURRENCE + *SURVEY, USPHS + WASTE DISPOSAL, RIVER + *MILK + *DIETARY HABIT + GROSS ALPHA + GROSS BETA + GROSS GAMMA + NUCLEAR DETONATION + SURFACE WATER, DISPOSAL MEDIA + *CONCENTRATION + MAN + FOOD

005170
RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 8
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
59 PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, 5(8)- 351-409 (AUGUST 1964)- GPO

DATA ARE PRESENTED ON THE RADIOACTIVITY FROM FALLOUT IN SAMPLES OF AIR, PRECIPITATION, MILK, FOODS, AND SURFACE WATERS COLLECTED DURING APRIL 1964 AT VARIOUS LOCATIONS THROUGHOUT NORTH AND SOUTH AMERICA. ENVIRONMENTAL LEVELS OF RADIOACTIVITY DURING THE CALENDAR YEAR 1963 ARE REPORTED FOR ARGONNE NATIONAL LABORATORY AND THE SAVANNAH RIVER PLANT AND FROM OCTOBER, 1962 TO MARCH 1964 FOR THE NEVADA TEST SITE. DATA ARE PRESENTED ON SR 90 IN SURFACE WATERS OF THE UNITED STATES DURING 1959-1963, ON RADIONUCLIDES DETECTED IN THE COLUMBIA RIVER DURING JANUARY 1962-JULY 1963, AND ON CROSS-CHECK ANALYSES OF RADIONUCLIDES IN MILK. TWO LOW-YIELD UNDERGROUND NUCLEAR TESTS AT THE NEVADA TEST SITE DURING JULY 1964 WERE ANNOUNCED BY THE ATOMIC ENERGY COMMISSION.

BARIUM + CALCIUM + CERIUM + *CESIUM + COBALT + *FALLOUT + *IODINE + MONITOR, LIQUID + PLUTONIUM + *RAINOUT + RUTHENIUM + *STRONTIUM + SURVEY, ENVIRONMENT + THORIUM + URANIUM + WASTE DISPOSAL, ATMOSPHERIC + ZIRCONIUM + AGRICULTURE + CHROMIUM + MANGANESE + MONITOR, AIR + MONITOR, SOLID + NEPTUNIUM + POTASSIUM + *SURFACE WATER, NUCLIDE OCCURRENCE + *SURVEY, USPHS + WASTE DISPOSAL, RIVER + ANALYTICAL TECHNIQUE + ANL + *MILK + GROSS ALPHA + GROSS BETA + GROSS GAMMA + NEVADA TEST SITE + NUCLEAR DETONATION + RIVER, COLUMBIA + RIVER, SAVANNAH + SAVANNAH RIVER PLANT + SURFACE WATER, DISPOSAL MEDIA + SURFACE WATER, SEDIMENT + CONCENTRATION + AQUATIC ORGANISM + FOOD + CALIBRATION

005171
RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 9
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
47 PAGES, FIGURES, TABLES, REFERENCES- RADIOLOGICAL HEALTH DATA, 5(9)- 411-456 (SEPTEMBER 1964)- GPO

DATA ARE PRESENTED ON THE RADIOACTIVITY DUE TO FALLOUT FISSION PRODUCTS IN SAMPLES OF AIR COLLECTED THROUGHOUT NORTH AND PAN AMERICA DURING MAY 1964, SAMPLES OF MILK COLLECTED THROUGHOUT THE U.S. AND CANADA DURING MAY 1964, AND SAMPLES OF SURFACE WATERS AND DRINKING WATERS COLLECTED THROUGHOUT THE U.S. DURING MARCH 1964. DATA ARE INCLUDED ON THE AVERAGE PER PERSON DIETARY CONSUMPTION AND INTAKE OF SR 90 AND CS 137 BY INDIVIDUALS LIVING IN NEW YORK, SAN FRANCISCO, AND CHICAGO DURING NOV. AND DEC. 1963, AND THE ENVIRONMENTAL RADIOACTIVITY DURING 1963 AT ATOMICS INTERNATIONAL, CANOGA PARK, CALIFORNIA, NATIONAL REACTOR TESTING STATION, IDAHO FALLS, IDAHO, AND THE PINELLAS PENINSULA PLANT, ST. PETERSBURG, FLA. THE STATUS OF STATE ENVIRONMENTAL SURVEILLANCE ACTIVITIES IS REVIEWED. THREE UNDERGROUND NUCLEAR TESTS AT THE NEVADA TEST SITE DURING AUGUST 1964 WERE ANNOUNCED.

BARIUM + CALCIUM + *CESIUM + *FALLOUT + *IODINE + MONITOR, LIQUID + NRTS + *RAINOUT + *STRONTIUM + SURVEY, ENVIRONMENT + WASTE DISPOSAL, ATMOSPHERIC + AGRICULTURE + MONITOR, AIR + MONITOR, SOLID + POTASSIUM + *SURFACE WATER, NUCLIDE OCCURRENCE + *SURVEY, USPHS + WASTE DISPOSAL, RIVER + ANALYTICAL TECHNIQUE + AI +

005171 *CONTINUED*
*MILK + *DIETARY HABIT + WATER, DRINKING + GROSS ALPHA + GROSS BETA + GROSS GAMMA + GROUND WATER, NUCLIDE OCCURRENCE + NUCLEAR DETONATION + PINELLAS PENINSULA + SOIL, NUCLIDE OCCURRENCE + STATE PROGRAM + SURFACE WATER, DISPOSAL MEDIA + SURVEY, RADIATION + VEGETATION + CONCENTRATION + FOOD + CALIBRATION

005183
RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 4
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
45 PAGES, FIGURES, TABLES- RADIOLOGICAL HEALTH DATA, 5(4)- 151-195 (APRIL 1964)- GPO

DATA ARE SUMMARIZED ON FISSION PRODUCT RADIOACTIVITY DUE TO FALLOUT IN SAMPLES OF AIRBORNE PARTICULATES AND PRECIPITATION COLLECTED THROUGHOUT THE U.S., CANADA, MEXICO, PAN AMERICA, AND ALONG THE 80TH MERIDIAN DURING DECEMBER 1963. DATA ARE INCLUDED ON SR 90 DEPOSITION ON THE EARTHS SURFACE IN 1962, ON THE SR 89, SR 90, CS 137, AND I 131 IN MILK SAMPLES COLLECTED THROUGHOUT THE U.S.- ON RADIONUCLIDES IN TEEN-AGERS DIET- THE RADIOACTIVITY IN SURFACE WATERS AND TAP WATER IN 1963- AND THE ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT BETTIS ATOMIC POWER LABORATORY AND MOUND LABORATORY FOR JULY 1962-JUNE 1963. ONE LOW YIELD UNDERGROUND NUCLEAR DETONATION AT THE NEVADA TEST SITE WAS REPORTED FOR MARCH 1964.

BARIUM + CALCIUM + *CESIUM + *FALLOUT + *IODINE + MONITOR, LIQUID + PLUTONIUM + *RAINOUT + *STRONTIUM + SURVEY, ENVIRONMENT + WASTE DISPOSAL, ATMOSPHERIC + ZIRCONIUM + AGRICULTURE + MONITOR, AIR + MONITOR, SOLID + *SURFACE WATER, NUCLIDE OCCURRENCE + *SURVEY, USPHS + WASTE DISPOSAL, RIVER + BETTIS + *MILK + *DIETARY HABIT + WATER, DRINKING + GROSS ALPHA + GROSS BETA + GROSS GAMMA + MOUND LABORATORY + NUCLEAR DETONATION + SOIL, NUCLIDE OCCURRENCE + SURFACE WATER, DISPOSAL MEDIA

005381
EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY
SAVANNAH RIVER PLANT, E. I. DU PONT DE NEMOURS AND COMPANY
18 PAGES- FEBRUARY 1964, DPSPU-64-30-1, SEMIANNUAL REPORT JULY THROUGH DECEMBER 1963- OTS

THIS REPORT, FOR THE PERIOD JULY 1 THROUGH DECEMBER 31, 1963, PRESENTS THE RESULTS OF THE ENVIRONMENTAL MONITORING PROGRAM FOR THE ATMOSPHERE, FOR VEGETATION AND FOOD, AND FOR WATER. IN NO CASE DOES THE MONITORING PROGRAM REVEAL CONCENTRATION OF RADIONUCLIDES IN EXCESS OF 4.6% OF THE MAXIMUM PERMISSIBLE CONCENTRATIONS.

BARIUM + CERIUM + CESIUM + COBALT + FALLOUT + *IODINE + MONITOR, LIQUID + RUTHENIUM + *STRONTIUM + *SURVEY, ENVIRONMENT + *WASTE DISPOSAL, ATMOSPHERIC + ZIRCONIUM + AGRICULTURE + CHROMIUM + MANGANESE + MONITOR, AIR + MONITOR, SOLID + SURFACE WATER, NUCLIDE OCCURRENCE + WASTE DISPOSAL, RIVER + MILK + GROSS ALPHA + GROSS BETA + GROSS GAMMA + RIVER, SAVANNAH + SAVANNAH RIVER PLANT + SURFACE WATER, DISPOSAL MEDIA + REACTOR, PRODUCTION + VEGETATION + CONCENTRATION + AQUATIC ORGANISM + FOOD

006794
ENVIRONMENTAL RADIOACTIVITY AT THE SHIPPINGPORT ATOMIC POWER STATION FOR THE SECOND HALF OF 1963 AND FOR CALENDAR YEAR 1963
PITTSBURGH NAVAL REACTORS OPERATIONS OFFICE, AEC
9 PAGES, TABLES- 1963, PNROO-DEV-129- CFSTI

DURING THE SECOND HALF OF 1963, MEASUREMENTS OF RADIOACTIVITY WERE MADE IN THE OHIO RIVER, ATMOSPHERE, AND FALLOUT IN THE VICINITY OF THE SHIPPINGPORT ATOMIC POWER STATION. THE RESULTS OF THESE MEASUREMENTS SUPPORT THE CONCLUSION THAT THE RADIOACTIVE WASTE RELEASED BY THE POWER STATION INTO THE AIR AND INTO THE OHIO RIVER DID NOT RESULT IN A SIGNIFICANT CHANGE IN THE NATURALLY OCCURRING RADIOACTIVITY IN THE ENVIRONMENT.

*EFFLUENT + FALLOUT + REACTOR, PWR + RAINOUT + SHIPPINGPORT (PWR) + *SURVEY, ENVIRONMENT + *WASTE DISPOSAL, ATMOSPHERIC + *SURFACE WATER, NUCLIDE OCCURRENCE + *WASTE DISPOSAL, RIVER + WATER, DRINKING + SURFACE WATER, DISPOSAL MEDIA

006924
EMMERSON B
ENVIRONMENTAL MONITORING IN THE OPERATION OF A NUCLEAR POWER STATION
CENTRAL ELECTRICITY GENERATING BOARD, LONDON
30 PAGES- CONF-365-13, JOINT HEALTH PHYSICS COMMITTEE AND CENTRAL ELECTRICITY GENERATING BOARD SYMPOSIUM ON ENVIRONMENTAL MONITORING AT BERKELEY, GLOUCESTERSHIRE 3RD - 4TH OCTOBER, 1963

THE ENVIRONS MONITORING PROGRAM BY THE HEALTH PHYSICS STAFF AT NUCLEAR POWER PLANTS IN ENGLAND IS DESCRIBED. VARIOUS TESTS ARE DESCRIBED AND THE SPECIFIC DUTIES OF MONITORS DURING BURST CARTRIDGE DETECTION TESTS ARE LISTED. A TYPICAL CIVIL NUCLEAR STATION HEALTH PHYSICS STAFF TREE IS ILLUSTRATED.

MONITOR, EMERGENCY + MONITOR, GENERAL PRACTICE + MONITOR, PERSONNEL + *UNITED KINGDOM + MONITOR, ENVIRONMENTAL + *RADIATION SAFETY AND CONTROL

007047
ACTIVITIES OF AECL IN THE FIELDS OF BIOLOGY, HEALTH PHYSICS AND MEDICINE
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
31 PAGES- NOVEMBER 1964, AECL-2107- AECL

007047 *CONTINUED*
THE VARIOUS SECTIONS OF THIS REPORT RELATE TO THE ACTIVITIES AND INTERESTS OF THE BIOLOGY AND HEALTH PHYSICS DIVISION AND THE MEDICAL DIVISION OF ORNL AND TO MEDICAL RESEARCH UNDERWAY IN THE HEALTH AND SAFETY BRANCH OF WNRE. THE MATERIAL IS PRESENTED IN A HIGHLY CONDENSED AND GENERALIZED FORM. DETAIL HAS BEEN DELIBERATELY AVOIDED.

ECOLOGY + DILUTION + DOSIMETRY + RADIATION DAMAGE + SURVEY, ENVIRONMENT + GROUND WATER, NUCLIDE OCCURRENCE + POPULATION EXPOSURE + *RADIATION PROTECTION, ORGANIZATION + METEOROLOGICAL SUPPORT + WASTE MANAGEMENT + PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + VEGETATION + CONCENTRATION + AQUATIC ORGANISM

007082
MORTON RJ
STATUS REPORT NO. 5 ON CLINCH RIVER STUDY
OAK RIDGE NATIONAL LABORATORY
149 PAGES, 28 FIGURES, 19 TABLES- OCTOBER 1965, ORNL-3721- CFSTI

THE FOUR STATUS REPORTS PREVIOUSLY ISSUED HAVE BEEN BASED PRIMARILY ON PROGRESS REPORTS SUBMITTED AT MEETINGS OF THE CLINCH RIVER STUDY STEERING COMMITTEE. THIS FIFTH STATUS REPORT IS MAINLY A SUMMARY OF THE STUDY FROM APRIL 26, 1962 TO DECEMBER 4, 1963. DURING THIS PERIOD THE STEERING COMMITTEE MET TWICE, IN FEBRUARY AND DECEMBER 1963, AND RECEIVED THE PROGRESS REPORTS UPON WHICH THIS REPORT IS LARGELY BASED.

CALCIUM + CESIUM + COBALT + DILUTION + EFFLUENT + PARTICLE SIZE + RUTHENIUM + STRONTIUM + *SURVEY, ENVIRONMENT + TRACER, FLUORESCENT + RHODAMINE B + SAMPLING + SURFACE WATER, NUCLIDE OCCURRENCE + ANALYTICAL TECHNIQUE + GROSS GAMMA + HYDRODYNAMIC ANALYSIS + ORNL + *RIVER, CLINCH + SURFACE WATER, SEDIMENT + THERMAL CONSIDERATION + HAZARDS ANALYSIS + HYDROLOGY + MINERAL EXCHANGE + RIVER, TENNESSEE + DISPERSION + CONCENTRATION + AQUATIC ORGANISM

007122
BROWN DJ
CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY-DECEMBER, 1964
HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASHINGTON
23 PAGES- 1964, HW-84549- CFSTI

THE CONCENTRATION OF RADIONUCLIDES DETECTED IN GROUND WATER SAMPLES COLLECTED DURING 1963 AND 1964 FROM OVER 500 MONITORING WELLS AT BATTELLE NORTHWEST ARE REPORTED. IN ADDITION, GROSS BETA RESULTS OF WATER SAMPLES TAKEN FROM CONFINED AQUIFERS ARE PRESENTED AND THE RESULTS OF SPECIAL TRITIUM ANALYSES ARE REPORTED.

GEOLOGY + GROUND WATER + MONITOR, LIQUID + *WASTE DISPOSAL + GROSS BETA + *GROUND WATER, NUCLIDE OCCURRENCE + GROUND WATER, TRACER + BATTELLE NORTHWEST

007430
BLOCK S + KATHREN RL + KUSIAN R + KINDEKEN CL + SCHIMMELFENNIG V
INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 19
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE
38 PAGES- MAY 23, 1965, UCRL-14116, CFSTI, $2.00 CY, $0.50 MN

BOTH SUBJECT AND AUTHOR INDEXES ARE GIVEN FOR THE FIRST 19 QUARTERLY REPORTS (THROUGH DECEMBER 1964) OF THE HAZARDS CONTROL DEPARTMENT OF LAWRENCE RADIATION LABORATORY, LIVERMORE. THE SUBJECT INDEX IS CROSS-REFERENCED TO SERVE THE INTERESTS OF WORKERS IN VARIOUS DISCIPLINES WITHIN THE FIELD OF HEALTH AND SAFETY. A TOTAL OF 275 ARTICLES ARE INDEXED.

AIR CLEANING + BERYLLIUM + COUNTER + DECONTAMINATION + DEUTERIUM + DOSIMETRY + FALLOUT + GLOVE BOX + IODINE + MERCURY + MONITOR, STACK + PLUTONIUM + URANIUM + WASTE DISPOSAL + MONITOR, AIR + SAMPLING + INSTRUMENT CALIBRATION + COUNTER, WHOLE BODY + *HAZARDS ANALYSIS + MONITOR + REACTOR + SHIELDING + X-RAY + SPECTROMETRY, GAMMA + INSTRUMENTS, MISC. + FILTERS

007462
ADAMS PC
ENVIRONMENTAL MONITORING REPORT- JULY - DECEMBER, 1964 AND 1964 SUMMARY
MOUND LABORATORY, MIAMISBURG, OHIO
18 PAGES, 5 TABLES- MARCH 26, 1965, MLM-1241- CFSTI

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO, IS PRESENTED FOR THE SECOND HALF OF 1964 AND A SUMMARY IS PRESENTED FOR THE ENTIRE YEAR. THE CONCENTRATION OF TRITIUM IN THE GREAT MIAMI RIVER WAS WITHIN THE MAXIMUM PERMISSIBLE CONCENTRATION RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS. THE AVERAGE CONCENTRATION OF POLONIUM RELEASED DID NOT EXCEED THE MAXIMUM PERMISSIBLE CONTINUOUS CONCENTRATION. THE CONCENTRATION OF POLONIUM AND PLUTONIUM IN THE ENVIRONMENTAL AIR WAS WITHIN THE MAXIMUM PERMISSIBLE LEVEL RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS. THERE WAS NO DETECTABLE CONCENTRATION OF TRITIUM IN THE ENVIRONMENTAL AIR DURING THIS PERIOD.

MPC + PLUTONIUM + *SURVEY, ENVIRONMENT + POLONIUM + SAMPLING + *SURFACE WATER, NUCLIDE OCCURRENCE + AIR + MONITOR, ENVIRONMENTAL + MOUND LABORATORY

007898
ADAMS PC
ENVIRONMENTAL MONITORING REPORT- JANUARY-JUNE 1965
MOUND LABORATORY, MONSANTO RESEARCH CORPORATION
16 PAGES, 3 FIGURES, 3 TABLES- JULY 16, 1965, MLM-1275- CFSTI, $1.00 CY, $0.50 MN

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO IS PRESENTED FOR THE FIRST HALF OF 1965. THE CONCENTRATION OF RADIONUCLIDES FROM MOUND LABORATORY IN THE GREAT MIAMI RIVER WAS WITHIN THE MAXIMUM PERMISSIBLE CONCENTRATION RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS. THE CONCENTRATION OF RADIONUCLIDES IN THE ENVIRONMENTAL AIR WAS ALSO WITHIN THE MAXIMUM PERMISSIBLE LEVEL RECOMMENDED BY THE NATIONAL COMMITTEE ON RADIATION PROTECTION AND MEASUREMENTS.

MONITOR, STACK + PARTICLE + *SURVEY, ENVIRONMENT + MONITOR, AIR + POLONIUM + SAMPLING + SURFACE WATER, NUCLIDE OCCURRENCE + GROSS ALPHA + MOUND LABORATORY

008175
NATHANS MW
PROJECT GNOME. ISOTOPE PROGRAM - FINAL REPORT
LAWRENCE RADIATION LABORATORY, LIVERMORE, CALIFORNIA
123 PAGES, TABLES, FIGURES- AUGUST 2, 1965, PNE-102F- CFSTI- $4.00

THIS REPORT DISCUSSES THE DISTRIBUTION AND THE DISPOSITION OF A NUMBER OF NUCLIDES FOLLOWING A NUCLEAR DETONATION IN A SALT MEDIUM AS WELL AS THE MEANS BY WHICH THESE NUCLIDES MIGHT BE RECOVERED.

ECONOMICS + GEOLOGY + *PLOWSHARE + PLUTONIUM + THORIUM + URANIUM + *ACTIVATION PRODUCT + POLONIUM + SAMPLING + GROSS BETA + GROSS GAMMA + GROUND WATER, NUCLIDE OCCURRENCE + NUCLEAR DETONATION + AMERICIUM + CURIUM + ISOTOPIC FRACTIONATION + RADIOLYTIC GAS + THALLIUM

008306
DROBINSKI JC + LAGATTA DP + GOLDIN AS + TERRILL JG
ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM
U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE, WINCHESTER, MASSACHUSETTS
15 PAGES, 8 FIGURES, 4 TABLES, 35 REFERENCES- HEALTH PHYSICS 11(5)- 385-395 (MAY 1965)

THE LEVELS OF CARBON-14 AND HYDROGEN-3 (TRITIUM) IN VARIOUS TYPES OF ENVIRONMENTAL SAMPLES COLLECTED OVER THE PERIOD JANUARY 1963 TO APRIL 1964 HAVE BEEN MEASURED AT THE NORTHEASTERN RADIOLOGICAL HEALTH LABORATORY. SAMPLE TYPES HAVE INCLUDED COMPOSITE FOODS (TOTAL DIETS), INDIVIDUAL FOOD ITEMS, ATMOSPHERIC CARBON DIOXIDE, AND HUMAN AND ANIMAL ORGANS, TISSUES AND FLUIDS.

*CARBON + SURVEY, ENVIRONMENT + *SAMPLING + RADIOCHEMICAL ANALYSIS + CONCENTRATION + MAN + FOOD

008493
ENVIRONMENTAL RADIOACTIVITY AT ARGONNE NATIONAL LABORATORY
ARGONNE NATIONAL LABORATORY
TID-21756 +. 28 PAGES, 2 FIGURES, 12 TABLES- DECEMBER 1964

DATA ON ENVIRONMENTAL RADIOACTIVITY AT ARGONNE DURING THE SECOND HALF OF 1964 ARE PRESENTED TOGETHER WITH A SUMMARY OF THE INFORMATION GIVEN EARLIER FOR THE FIRST HALF OF THE YEAR.

BARIUM + CERIUM + CESIUM + COBALT + FALLOUT + IODINE + NIOBIUM + PLUTONIUM + RUTHENIUM + STRONTIUM + *SURVEY, ENVIRONMENT + THORIUM + URANIUM + ZIRCONIUM + MONITOR, AIR + SURFACE WATER, NUCLIDE OCCURRENCE + AIR + ANL + MILK + GROSS ALPHA + GROSS BETA + GROSS GAMMA + PROTACTINIUM + ANTIMONY + LANTHANUM

009606
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
21 PAGES, MARCH 1965

ACTIVITIES FOR MARCH 1965 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

CADMIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

009511
RAFTER TA
REPORT ON THE WORK OF THE INSTITUTE OF NUCLEAR SCIENCES, MARCH 1, 1961 - FEBRUARY 28, 1962
INSTITUTE OF NUCLEAR SCIENCES, LOWER HUTT, NEW ZEALAND

009511 *CONTINUED*
NP-14825 + A.E.C.-87 +. 117 PAGES, MARCH 1962, DEP/MN

REPORT COVERS THE WORK OF THE INSTITUTE OF NUCLEAR SCIENCES FOR THE PERIOD MARCH 1961 TO FEBRUARY 1962. RESEARCH WORK INCLUDES STUDIES ON RADIOACTIVE FALLOUT, C-13/C-12 AGE VARIATIONS, TRITIUM MEASUREMENTS, AND THE REPORTING OF C-14 RESULTS.

CARBON + *FALLOUT + HYDROLOGY + NEW ZEALAND + *GEOLOGY, GEOCHEMICAL + ACCELERATOR

012287
HAWKINS OB + SCHMALZ BL
ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION
IDAHO OPERATIONS OFFICE, U.S. ATOMIC ENERGY COMMISSION, IDAHO FALLS
IDO-12043 + CONF-651108-1 +. 46 PAGES, 4 FIGURES, AUGUST 1965, PRESENTED AT SYMPOSIUM ON ISOTOPE TECHNIQUES, URBANA, ILLINOIS, CFSTI $2.00 CY, $0.50 MN

INFORMATION ON THE CONCENTRATION OF TRITIUM IN WASTE, PRECIPITATION, AND SURFACE AND GROUND WATER AT THE NATIONAL REACTOR TESTING STATION AND SURROUNDING AREAS IS PRESENTED. IT IS SHOWN THAT THE PRESENT CONCENTRATION OF TRITIUM IN THE ENVIRONMENTAL WATER IS ABOUT 100 TIMES PRE-HYDROGEN-BOMB LEVELS. NRTS OPERATIONS HAVE NOT NOTICEABLY CONTRIBUTED TO THIS CONTAMINATION EXCEPT IN THE CASE OF GROUND WATER DOWN GRADIENT FROM THE CHEMICAL PROCESSING PLANT. TRITIATED WATER EMANATING FROM THE IDAHO CHEMICAL PROCESSING PLANT HAS BEEN DETECTED DOWN THE GROUND-WATER GRADIENT OVER AN AREA OF ABOUT 75 SQUARE MILES. THE TRITIUM CONCENTRATION IN GROUND WATER DECREASES EXPONENTIALLY WITH DISTANCE FROM THE POINT OF INJECTION. AN EMPIRICAL EQUATION HAS BEEN DERIVED WHICH DESCRIBES THIS FUNCTION.

*NRTS + RAINOUT + *WASTE DISPOSAL, TERRESTRIAL + SURFACE WATER, NUCLIDE OCCURRENCE + GROUND WATER, NUCLIDE OCCURRENCE + WASTE DISPOSAL, LIQUID + HYDROLOGY + HYDROLOGY, RATE OF MOVEMENT

013282
THATCHER LL + PAYNE BR + CAMERON JF
TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
CONF-765 +. 29 PAGES, 13 FIGURES, 8 TABLES, 9 REFERENCES, PAGES 646-674 OF RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, PROCEEDINGS OF THE 2ND CONFERENCE ON RADIOACTIVE FALLOUT, GERMANTOWN, MD., NOVEMBER 1964, CFSTI $6.50 CY.

TRITIUM LEVELS ROSE FROM AN AVERAGE BASE OF 80 TRITIUM UNITS (T.U.) FOR CONTINENTAL SITES IN THE NORTHERN HEMISPHERE TO AVERAGE PEAKS OF 2000 T.U. IN 1962 AND 4000 TO 5000 IN 1963. INDIVIDUAL PEAKS WERE HIGHER, REACHING 10,000 IN NORTHERN CANADA. LEVELS IN PRECIPITATION WERE LOWER IN 1964. THE PEAK YEAR APPEARS TO HAVE BEEN 1963. THE RATE OF DECREASE FROM 1963 TO 1964 IS LESS THAN THE COMPARABLE PERIOD 1959 TO 1961, POSSIBLY REFLECTING THE HIGHER ALTITUDES INVOLVED IN THE LAST TESTING. TRITIUM AND SR-90 DEPOSITION VALUES OVER THE GLOBE SHOW INTERESTING CONSISTENCIES THAT MAY PERMIT THE ESTIMATION OF TRITIUM CONCENTRATION FOR UNSAMPLED AREAS. THE HTO/SR-90 RATIO INCREASES TOWARD THE HIGH MID-LATITUDES IN THE NORTHERN HEMISPHERE. THE SOUTHERN-HEMISPHERE PRECIPITATION AVERAGED ONLY 15 T.U. IN 1963 COMPARED TO SEVERAL THOUSAND TRITIUM UNITS FOR THE NORTHERN HEMISPHERE. IT IS ESTIMATED THAT IN 1962 AND 1963 THE DEPOSITION OF TRITIUM HAD BEEN APPROXIMATELY 44 OR 96 KG, DEPENDING ON WHETHER OR NOT OCEANIC EXCHANGE WAS INCLUDED IN THE CALCULATION. THIS WOULD LEAVE EITHER 124 OR 72 KG IN THE STRATOSPHERE BASED ON THE ASSUMPTION OF A 168-KG PRODUCTION IN 1961 AND 1962.

ATMOSPHERIC CIRCULATION, GLOBAL + FALLOUT + RAINOUT + STRATOSPHERE + STRONTIUM

013345
ADAMS PC + ANDERSON HF
ENVIRONMENTAL MONITORING REPORT. JULY-DECEMBER 1965 AND 1965 SUMMARY
MOUND LABORATORY, MIAMISBURG, OHIO
MLM-1335 +. 18 PAGES, 5 TABLES, FEBRUARY 28, 1966

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO IS PRESENTED FOR THE SECOND HALF OF 1965 AND A SUMMARY IS PRESENTED FOR THE ENTIRE YEAR. THE CONCENTRATION OF RADIONUCLIDES FROM MOUND LABORATORY IN THE GREAT MIAMI RIVER AND IN THE ENVIRONMENTAL AIR WAS WITHIN THE RADIOACTIVITY CONCENTRATION GUIDES RECOMMENDED BY THE FEDERAL RADIATION COUNCIL.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, $1.00 CY, $0.50 MN

*PLUTONIUM + ROVER PROGRAM + *SURVEY, ENVIRONMENT + POLONIUM + SAMPLING + SURFACE WATER, NUCLIDE OCCURRENCE + AIR + *MOUND LABORATORY

013347
BUTTLAR HV
TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE
TECHNICAL UNIVERSITY OF MUNCHEN
5 PAGES, 7 FIGURES, 12 REFERENCES, NUCLEAR INSTRUMENTS AND METHODS 37(2), PAGES 288-92, (DECEMBER 1965)

SAMPLE WATER IS CONVERTED TO HYDROGEN GAS AND THEN CONTACTED WITH ETHYLENE TO YIELD ETHANE. THE TRITIUM RADIOACTIVITY IS COUNTED IN AN DESCHGER-TYPE COUNTER IN THE LIMITED PROPORTIONAL REGION.

013347 *CONTINUED*
A TRANSISTORIZED ELECTRONIC CIRCUIT ALLOWS SIMULTANEOUS REGISTRATION OF TRITIUM COUNTS PLUS BACKGROUND BELOW, AND MAINLY BACKGROUND ABOVE ABOUT 15 KEV. WITH A GEOMETRIC VOLUME OF THE CENTRAL TRITIUM COUNTER OF 2.9 LITERS, THE ANTICOINCIDENCE BACKGROUND IS 2.74 PLUS-OR-MINUS 0.03 CPM IN THE TRITIUM CHANNEL. A SAMPLE OF 100 TU HAS A SAMPLE COUNTING RATE OF 1.32 CPM WHEN THE ETHANE PRESSURE IS 750 MM HG. DETAILS ABOUT BACKGROUND TRITIUM SPECTRUM, EFFICIENCY, RELIABILITY AND LONG-TIMES STABILITY ARE GIVEN. THE TRITIUM CONCENTRATIONS OF WATER SAMPLES FROM RHINE AND MAIN RIVER TAKEN BETWEEN 1961 AND 1964 SHOW PRONOUNCED MAXIMA IN THE SUMMER, ABOUT TWO MONTHS LATER AND A FACTOR 5 SMALLER THAN THE RAIN MAXIMA. WINTER MINIMA DIFFER BY A FACTOR OF 2.

COUNTER + *SURFACE WATER, NUCLIDE OCCURRENCE + *ANALYTICAL TECHNIQUE + GERMANY

013618
EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JANUARY THROUGH JUNE 1966
E. I. DU PONT DE NEMOURS AND COMPANY, SAVANNAH RIVER LABORATORY, AIKEN, SOUTH CAROLINA
DPST-66-30-2 +. 17 PAGES, AUGUST 1966

THIS REPORT, FOR THE PERIOD JANUARY 1 THROUGH JUNE 30, 1966, PRESENTS THE RESULTS OF THE ENVIRONMENTAL MONITORING PROGRAM FOR THE ATMOSPHERE, VEGETATION AND FOOD, AND WATER. THE QUANTITY OF RADIOACTIVE WASTE RELEASED BY THE SAVANNAH RIVER PLANT TO ITS ENVIRONS WAS, FOR THE MOST PART, TOO SMALL TO BE DISTINGUISHED FROM NATURAL BACKGROUND RADIATION OR WAS OBSCURED BY WORLDWIDE FALLOUT FROM NUCLEAR WEAPONS TESTING. FALLOUT FROM THE CHINESE NUCLEAR TEST ON MAY 9, 1966, WAS DETECTED AT SRP.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA 22151 $1.00 CY $0.50 MN

CESIUM + FALLOUT + STRONTIUM + *SURVEY, ENVIRONMENT + SURFACE WATER, NUCLIDE OCCURRENCE + AIR + MILK + RIVER, SAVANNAH + *SAVANNAH RIVER PLANT + GAMMA + VEGETATION + CONCENTRATION + AQUATIC ORGANISM + FOOD

013775
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
18 PAGES, FEBRUARY 1965

ACTIVITIES FOR FEBRUARY 1965 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013776
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
19 PAGES, OCTOBER 1964

ACTIVITIES FOR OCTOBER 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013777
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
22 PAGES, JULY 1964

ACTIVITIES FOR JULY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IN REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013778
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
18 PAGES, JUNE 1964

ACTIVITIES FOR JUNE 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013779
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY USAEC, NEW YORK OPERATIONS OFFICE
23 PAGES, MAY 1964

ACTIVITIES FOR MAY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATION OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013780
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY USAEC, NEW YORK OPERATIONS OFFICE
24 PAGES, APRIL 1964

ACTIVITIES FOR APRIL 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATION OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013781
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
24 PAGES, MARCH 1964

ACTIVITIES FOR MARCH 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013782
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
19 PAGES, FEBRUARY 1964

ACTIVITIES FOR FEBRUARY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY +

013782 *CONTINUED*
INSTRUMENT, COMPONENT + RADIATION MONITORS

013783
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
19 PAGES, JANUARY 1964

ACTIVITIES FOR JANUARY 1964 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013784
STATUS AND PROGRESS REPORT
HEALTH AND SAFETY LABORATORY, USAEC, NEW YORK OPERATIONS OFFICE
21 PAGES, DECEMBER 1963

ACTIVITIES FOR DECEMBER 1963 ARE REPORTED. DATA ARE REPORTED FOR ANALYSES OF ENVIRONMENTAL SAMPLES. PROGRESS IS REPORTED IN STUDIES RELATED TO RADIOLOGICAL HEALTH AND DEVELOPMENT OF RADIATION INSTRUMENTS.

AVAILABILITY - UNITED STATES ATOMIC ENERGY COMMISSION, NEW YORK OPERATIONS OFFICE

BARIUM + CADMIUM + CERIUM + CESIUM + DEPOSITION + DOSIMETRY + *FALLOUT + INHALATION + PARTICLE SIZE + PLUTONIUM + RAINOUT + STRONTIUM + SURVEY, ENVIRONMENT + URANIUM + ZIRCONIUM + MANGANESE + MONITOR, AIR + PROMETHIUM + SAMPLING + AIR + GROSS GAMMA + INSTRUMENT CALIBRATION + IRON + RADON + YTTRIUM + ANTIMONY + INSTRUMENT, COMPONENT + RADIATION MONITORS

013795
BUTTLAR HV + FARZINE K + WOHLFAHRT D
TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE
INSTITUT FUR TECHNISCHE KERNPHYSIK DER TECHNISCHEN HOCHSCHULE DARMSTADT
CONF-650652 + GMELIN-AED-CONF-65-158 +. 16 PAGES, 7 FIGURES, 12 REFERENCES, PAGES 471-486, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

SAMPLE WATER IS CONVERTED TO HYDROGEN GAS AND THEN REACTED WITH ETHYLEN TO YIELD ETHANE. THE TRITIUM RADIOACTIVITY IS COUNTED IN AN DESCHGER-TYPE COUNTER IN THE LIMITED PROPORTIONAL REGION. A TRANSISTORIZED ELECTRONIC CIRCUIT ALLOWS SIMULTANEOUS REGISTRATION OF TRITIUM COUNTS PLUS BACKGROUND BELOW, AND MAINLY BACKGROUND ABOVE ABOUT 15 KEV. WITH A GEOMETRIC VOLUME OF THE CENTRAL TRITIUM COUNTER OF 2.9 LITERS, THE ANTICOINCIDENCE BACKGROUND IS 2.74 PLUS OR MINUS 0.03 CPM IN THE TRITIUM CHANNEL. A SAMPLE OF 100 TU HAS A SAMPLING COUNTING RATE OF 1.32 CPM WHEN THE ETHANE PRESSURE IS 750 MM HG. DETAILS ABOUT BACKGROUND, TRITIUM SPECTRUM, EFFICIENCY, RELIABILITY, AND LONG-TIME STABILITY ARE GIVEN. THE TRITIUM CONCENTRATIONS OF WATER SAMPLES FROM RHINE AND MAIN RIVER TAKEN BETWEEN 1961 AND 1964 SHOW PRONOUNCED MAXIMA IN THE SUMMER, ABOUT TWO MONTHS LATER AND A FACTOR 5 SMALLER THAN THE RAIN MAXIMA. WINTER MINIMA DIFFER BY A FACTOR OF 2.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

COUNTER + *SURFACE WATER, NUCLIDE OCCURRENCE + ANALYTICAL TECHNIQUE + GERMANY

013797
FERGUSSON GJ
RADIOCARBON AND TRITIUM IN THE UPPER TROPOSPHERE
WM. H. JOHNSTON LAB., INC., BALTIMORE
CONF-650652 + GMELIN-AED-CONF-65-158 +. 16 PAGES, 4 FIGURES, 2 TABLES, 7 REFERENCES, PAGES 525-540, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

A NUMBER OF MEASUREMENTS HAVE BEEN MADE OF C-14 CONCENTRATION IN THE UPPER TROPOSPHERE BY COLLECTION OF CARBON DIOXIDE WITH MOLECULAR SIEVE SAMPLERS. SAMPLES HAVE BEEN COLLECTED FROM 15 DEGREES N TO 48 N AND FROM 30,000 TO 43,000 FEET ALTITUDE. THESE MEASUREMENTS HAVE SHOWN C-14 ACTIVITIES UP TO TEN TIMES THE PRE-BOMB GROUND LEVEL ACTIVITY. THE OBSERVED ACTIVITY DECREASES RAPIDLY WITH DECREASING LATITUDE AND ALTITUDE. STRONG STRATIFICATION HAS BEEN EVIDENT IN SOME SETS OF MEASUREMENTS. A SERIES OF MEASUREMENTS DURING SPRING 1963, WHEN C-14 LEVELS IN THE UPPER TROPOSPHERE WERE HIGH, YIELDED A T/C-14 RATIO OF 0.48 PLUS OR MINUS 0.12. THIS RESULT IS IN CLOSE AGREEMENT WITH THE STRATOSPHERIC DATA OF HAGEMANN FOR THE 1957-58 PERIOD, AND IMPLIES THAT THE CHANGING RATIO OF FUSION TO FISSION DEVICES HAS NOT BEEN ACCOMPANIED BY A SIGNIFICANT CHANGE IN THE RATIO OF T TO C-14 PRODUCTION. THE ANNUAL ADDITION OF C-14 TO THE TROPOSPHERE IS EASILY COMPUTED FROM GROUND LEVEL C-14 MEASUREMENTS. THUS FROM THE T/C-14 RATIO OF MATERIAL ENTERING THE TROPOSPHERE THE ANNUAL INPUT OF TRITIUM CAN BE COMPUTED MORE PRECISELY THAN FROM SURFACE TRITIUM MEASUREMENTS, AND SO CAN AID UNDERSTANDING OF THE TRITIUM CYCLE.

013797 *CONTINUED*
AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

CARBON + *SAMPLING + *TROPOSPHERE

013799
GONSIOR B + FRIEDMAN I + LINDENMAYR G
NEW TRITIUM AND DEUTERIUM MEASUREMENTS IN ATMOSPHERIC HYDROGEN
CONF-650652 + GMELIN-AED-CONF-65-158 +. 10 PAGES, 5 FIGURES, PAGES 549-559, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASH., JUNE 7-11, 1965

RESULTS ARE PRESENTED FOR TRITIUM CONCENTRATIONS IN ATMOSPHERIC HYDROGEN SAMPLES DATING BACK TO 1961.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

DEUTERIUM + HYDROGEN + *ANALYTICAL TECHNIQUE

013806
VERHAGEN BT + SELLSCHOP JP
TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES
UNIVERSITY OF THE WITWATERSRAND, SOUTH AFRICA
CONF-650652 + GMELIN-AED-CONF-65-158 +. 12 PAGES, 9 FIGURES, PAGES 659-670, PRESENTED AT INTERNATIONAL CARBON-14 AND TRITIUM DATING CONFERENCE, PULLMAN, WASHINGTON, JUNE 7-11, 1965

DATA ARE PRESENTED ON THE TRITIUM CONTENT OF SOME SUBTERRANEAN WATERS OF SOUTH AFRICA. A THERMAL DIFFUSION SYSTEM WAS USED FOR ENRICHMENT OF TRITIUM. COUNTING IS DONE WITH A GAS PROPORTIONAL COUNTER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFO., NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $8.00 CY

COUNTER + *ANALYTICAL TECHNIQUE + *GROUND WATER, NUCLIDE OCCURRENCE + SOUTH AFRICA

015767
ANDERSON HF + SHEEHAN WE
ENVIRONMENTAL MONITORING REPORT- JANUARY-JUNE 1966
MOUND LABORATORY, MIAMISBURG, OHIO
MLM-1356 +. 22 PAGES, 3 FIGURES, 5 TABLES, SEPTEMBER 1, 1966

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE SURROUNDINGS OF MOUND LABORATORY, MIAMISBURG, OHIO, IS PRESENTED FOR THE FIRST HALF OF 1966. THE CONCENTRATION OF RADIONUCLIDES FROM MOUND LABORATORY IN THE GREAT MIAMI RIVER AND IN THE AIR WAS WITHIN THE STANDARDS SPECIFIED BY THE ATOMIC ENERGY COMMISSION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

MONITOR, STACK + PLUTONIUM + *SURVEY, ENVIRONMENT + MONITOR, AIR + POLONIUM + SAMPLING + SURFACE WATER, NUCLIDE OCCURRENCE + AIR + *MOUND LABORATORY

015959
SOLDAT JK + ESSIG TH
EVALUATION OF RADIOLOGICAL CONDITIONS IN THE VICINITY OF HANFORD FOR 1965
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-316 +. 39 PAGES, 23 FIGURES, 7 TABLES, 13 REFERENCES, NOVEMBER 11, 1966

THE EVALUATION OF RESULTS OBTAINED FROM THE HANFORD ENVIRONMENTAL SURVEILLANCE PROGRAM FOR 1965 INDICATES THAT MOST OF THE ENVIRONMENTAL RADIATION DOSE RECEIVED BY THE MAJORITY LIVING IN THE NEIGHBORHOOD OF THE HANFORD PROJECT WAS DUE TO NATURAL SOURCES AND WORLD-WIDE FALLOUT RATHER THAN TO HANFORD OPERATIONS. OF THE LOW-LEVEL WASTES THAT WERE RELEASED TO THE ENVIRONMENT, NEUTRON-INDUCED RADIONUCLIDES PRESENT IN REACTOR COOLING WATER DISCHARGED TO THE COLUMBIA RIVER CONTINUED TO BE THE SOURCE OF GREATEST POTENTIAL RADIATION DOSE TO PEOPLE IN THE ENVIRONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

CESIUM + DOSE + *FALLOUT + INGESTION + IODINE + PARTICLE + SODIUM + STRONTIUM + *SURVEY, ENVIRONMENT + WASTE DISPOSAL, TERRESTRIAL + ACTIVATION PRODUCT + AGRICULTURE + ARSENIC + CHROMIUM + COPPER + NEPTUNIUM + PHOSPHORUS + RARE EARTH + SAMPLING + SURFACE WATER, NUCLIDE OCCURRENCE + ZINC + AIR + MILK + DOSE CALCULATION, INTERNAL + WATER, DRINKING + GROSS BETA + RIVER, COLUMBIA + WASTE DISPOSAL, LIQUID + POPULATION EXPOSURE + DOSE CALCULATION, EXTERNAL + *BATTELLE NORTHWEST + HYDROLOGY, RATE OF MOVEMENT + ANIMAL + CONCENTRATION

016929
ELK RIVER REACTOR SYSTEM MONITORING DATA
RURAL COOPERATIVE POWER ASSOCIATION
COO-651-32 +. 61 PAGES, 10 FIGURES, SEPTEMBER 1966

BULK OF REPORT IS DATA ON WATERBORNE AND AIRBORNE ACTIVITY LEVELS IN PLANT LOCATION AND SYSTEMS. TRITIUM REACHES EQUILIBRIUM ABOUT 3 MONTHS AFTER A CYCLE STARTUP, BUT ONLY 1/10TH OF THAT EXPECTED. IODINE IN COOLANT IS RELATED TO CRUD BURSTS, INDICATING THAT CRUD IS A HOLDUP MECHANISM. REACTOR-OFFGAS SYSTEM (SCRUBBER, FILTER, ETC.) WAS TRIED OUT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

REACTOR, BWR + ELK RIVER (BWR) + *REPORT, OPERATIONS ANALYSIS + OFF GAS + *MONITORING SYSTEM, RADIATION + *SURVEILLANCE PROGRAM

016978
ANDERSON HF + SHEEHAN WE
ENVIRONMENTAL MONITORING REPORT. JULY-DECEMBER 1966 AND 1966 SUMMARY
MOUND LAB., MIAMISBURG, OHIO
MLM-1391 +. 23 PAGES, 7 TABLES, FEBRUARY 10, 1967

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO, IS PRESENTED FOR THE SECOND HALF OF 1966, AND A SUMMARY IS PRESENTED FOR THE YEAR. THE CONCENTRATION OF RADIONUCLIDES FROM MOUND LAB. IN THE GREAT MIAMI RIVER AND IN THE ENVIRONMENTAL AIR WAS WITHIN THE STANDARDS SPECIFIED BY THE AEC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, SPRINGFIELD, VA., $3.00 COPY, $0.65 MICROFICHE

PLUTONIUM + *SURVEY, ENVIRONMENT + MONITOR, AIR + POLONIUM + SAMPLING + STACK + SURFACE WATER, NUCLIDE OCCURRENCE + AIR + MOUND LABORATORY

020442
ATHAVALE RN + LAL D + RAMA
MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90
TATA INST. OF FUNDAMENTAL RESEARCH, BOMBAY
31 PAGES, 10 FIGURES, 6 TABLES, 17 REFERENCES, PROC. INDIAN ACAD. SCI., SECT A65, PAGE 73-103, (FEBRUARY 1967)

THE CONCENTRATIONS OF TRITIUM WERE DETERMINED IN WET PRECIPITATIONS OCCURRING OVER THE INDIAN SUBCONTINENT DURING 1961 TO 1964. THE TRITIUM CONCENTRATIONS VARIED SIGNIFICANTLY DURING THE PERIOD OF OBSERVATION. HIGHEST CONCENTRATIONS WERE OBSERVED DURING 1963. THE TRITIUM AND STRONTIUM DATA FOR THE INLAND, COASTAL, AND ISLAND STATIONS WERE ANALYZED TO EVALUATE THE IMPORTANCE OF REEVAPORATION OF TRITIUM FROM CONTINENTS AND THE MOLECULAR EXCHANGE OF ATMOSPHERIC TRITIUM WITH OCEANIC WATER.

*FALLOUT + RAINOUT + STRONTIUM + INDIA + PRECIPITATION

022001
ANDERSON HF + SHEEHAN WE
ENVIRONMENTAL MONITORING REPORT. JANUARY-JUNE 1967
MOUND LAB., MIAMISBURG, OHIO
MLM-1425 +. 37 PAGES, TABLES, FIGURES, JULY 17, 1967

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO, IS PRESENTED FOR THE FIRST HALF OF 1967. THE AVERAGE CONCENTRATION OF RADIONUCLIDES FROM MOUND LABORATORY IN THE GREAT MIAMI RIVER AND IN THE ENVIRONMENTAL AIR (AVERAGE OF ALL ZONES) WAS WITHIN THE STANDARDS SET BY THE AEC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA $3.00 COPY, $0.65 MICROFICHE

AEROSOL + PLUTONIUM + RIVER + *WATER + POLONIUM + *AIR + MOUND LABORATORY + RADIOISOTOPE + ENVIRONMENT + *MONITORING PROGRAM, ENVIRONMENTAL

022813
DATA - SECTION IV. OTHER DATA
US PUBLIC HEALTH SERVICE
10 PAGES, 7 TABLES, 4 FIGURES, RADIOLOGICAL HEALTH DATA AND REPORTS 8(11), PAGES 664-673 (NOVEMBER 1967)

THIS SECTION CONTAINS REPORT ON SR-90 IN HUMAN VERTABRAE COLLECTED IN 1966 IN NEW YORK CITY AND IN SAN FRANCISCO. REPORTS ENVIRONMENTAL SURVEYS FOR THREE SITES OF THE LAWRENCE RADIATION LABORATORY (JULY-DECEMBER 1966) AND OF MOUND LABORATORY (JULY-DECEMBER AND ANNUAL SUMMARY 1966). THE USAEC REPORTED UNDERGROUND NUCLEAR TESTS AT THE NEVADA TEST SITE ON OCTOBER 18, 1967, AND ON OCTOBER 25. IN ADDITION THE AEC REPORTED SEISMIC DATA ON OCTOBER 17 AND OCTOBER 23, 1967, INDICATING SOVIET NUCLEAR TESTS IN SIBERIA.

022813 *CONTINUED*
*FALLOUT + STRONTIUM + WATER + MOUND LABORATORY + LRL + *MONITORING PROGRAM, ENVIRONMENTAL + *SURVEILLANCE PROGRAM + CONCENTRATION + MAN

023261
EVANS AG
NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES
SAVANNAH RIVER LAB., E. I. DU PONT DE NEMOURS AND CO., AIKEN, S. C.
1 PAGE, ABSTRACT IN HEALTH PHYSICS 13, PAGE 931, (1967), PAPER PRESENTED AT THE TWELFTH ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY, WASHINGTON, D. C., JUNE 18-27, 1967

WORLD-WIDE POPULATIONS ARE CHRONICALLY EXPOSED TO TRITIUM FROM NUCLEAR WEAPONS TESTS AND RELEASES FROM NUCLEAR FACILITIES. ESTIMATES OF THE RADIATION DOSE FROM ASSIMILATION OF TRITIUM OXIDE, THE COMMON FORM OF ENVIRONMENTAL TRITIUM, ARE BASED ON THE ASSUMPTION THAT TRITIUM REMAINS IN BODY WATER UNTIL EXCRETED. ANALYSES OF DEER TISSUES, HOWEVER, INDICATE THAT CHRONIC EXPOSURE TO TRITIUM CAUSES SIGNIFICANT LABELING OF ORGANIC MOLECULES. THE DEGREE OF LABELING WAS DETERMINED FROM TRITIUM ASSAYS OF SEVEN TISSUES (HEART, LIVER, KIDNEYS, SPLEEN, BRAIN, MUSCLE AND FAT) FROM FIFTY-TWO DEER HARVESTED ON THE SAVANNAH RIVER PLANT SITE. IN MOST TISSUES, THE TRITIUM-HYDROGEN RATIOS IN BODY WATER AND IN THE WATER OF COMBUSTION OF DRIED TISSUES WERE THE SAME. THIS INCORPORATION OF TRITIUM IN THE ORGANIC COMPONENT OF DEER TISSUES RESULTS IN DOSES UP TO 1.5 TIMES HIGHER THAN ESTIMATED IF ONLY THE TRITIUM IN BODY WATER IS CONSIDERED.

*DOSE CALCULATION, INTERNAL + SAVANNAH RIVER PLANT + ANIMAL + CONCENTRATION

025581
ANDERSON HF + SHEEHAN WE
ENVIRONMENTAL MONITORING REPORT - JULY 1967 AND 1967 SUMMARY
MOUND LABORATORIES, MIAMISBURG, OHIO
MLM-1464 +. 46 PAGES, 3 FIGURES, 11 TABLES, JANUARY 15, 1968

THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO, IS PRESENTED FOR THE SECOND HALF OF 1967, AND A SUMMARY IS PRESENTED FOR THE ENTIRE YEAR. THE AVERAGE CONCENTRATION OF RADIONUCLIDES FROM MOUND LABORATORY IN THE GREAT MIAMI RIVER AND IN THE ENVIRONMENTAL AIR (AVERAGE OF ALL ZONES) WAS WITHIN THE STANDARDS SPECIFIED BY THE USAEC.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

AIRBORNE RELEASE + *PLUTONIUM + *POLONIUM + *MONITOR, ENVIRONMENTAL + CONTAMINATION + RADIATION SAFETY AND CONTROL

025597
HOLLAND JZ
PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE
U.S. ATOMIC ENERGY COMMISSION
15 PAGES, 12 FIGURES, 3 TABLES, 17 REFERENCES, PAGES 23-38, FROM COLLOQUE INTERNATIONAL SUR LA POLLUTION RADIOACTIVE DES MILIEUX GAZEUX (RADIOACTIVE POLLUTION OF GASEOUS MEDIA). BOOK I. SACLAY NOVEMBER 12-16, 1963

RADIONUCLIDES CAN BE INTRODUCED INTO THE UPPER TROPOSPHERE, STRATOSPHERE, MESOSPHERE, AND HIGHER LAYERS OF THE ATMOSPHERE BY BOTH PEACEFUL AND MILITARY USES OF NUCLEAR ENERGY. EXAMPLES OF PEACEFUL USES WHICH MIGHT RELEASE RADIOACTIVITY INTO THESE REGIONS ARE PROPULSION SYSTEMS AND AUXILIARY POWER SUPPLIES FOR OUTER-SPACE VEHICLES. THE PREDICTION AND THEREFORE CONTROL OF THE DISTRIBUTION AND FALLOUT OF SUCH CONTAMINANTS PRESENTS A NUMBER OF NOVEL SCIENTIFIC PROBLEMS. AN OUTLINE IS GIVEN OF THE USAEC COORDINATED PROGRAMS OF SAMPLING-DEVICE DEVELOPMENT, ANALYTICAL METHODS DEVELOPMENT, SAMPLE COLLECTION AND ANALYSIS, AND METEOROLOGICAL EVALUATION OF DATA.

AVAILABILITY - PRESSES UNIVERSITAIRES DE FRANCE, 108, BOULEVARD SAINT-GERMAIN, PARIS, VI, FRANCE

AEROSOL + CADMIUM + CARBON + CERIUM + CESIUM + ATMOSPHERIC DIFFUSION, CLIMATOLOGY + *ATMOSPHERIC DIFFUSION, GLOBAL + *FALLOUT + KRYPTON + ATMOSPHERIC STABILITY + SODIUM + *STRATOSPHERE + STRONTIUM + *SAMPLING + AIRCRAFT + COSMIC RADIATION + TUNGSTEN + *RADIOACTIVITY RELEASE + *MESOSPHERE + RHODIUM + *TROPOSPHERE + AGENCY, AEC

027909
MOGHISSI AA + PORTER CR
TRITIUM IN SURFACE WATERS OF THE UNITED STATES, 1966
SOUTHEASTERN RADIOLOGICAL HEALTH LAB., MONTGOMERY, ALA.
3 PAGES, 1 TABLE, 7 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 9(7), PAGES 337-339 (JULY 1968)

DURING 1964, A TRITIUM SAMPLING NETWORK WAS ESTABLISHED BY THE PUBLIC HEALTH SERVICE TO MEASURE THE LEVELS AND CONSEQUENTLY TO DETERMINE THE PUBLIC HEALTH SIGNIFICANCE OF TRITIUM IN SURFACE WATERS OF THE U.S. ANALYTICAL PROCEDURES ARE DESCRIBED. DATA FOR THE SAMPLES OBTAINED ARE PRESENTED. A MEANS FOR ESTIMATING THE RADIATION DOSE RESULTING FROM TRITIUM IN THE BODY IS DEVELOPED.

*SAMPLING + *SURFACE WATER, NUCLIDE OCCURRENCE + RADIATION SAFETY AND CONTROL + *RADIOLOGICAL ASSISTANCE + UNITED STATES

027910
DALY JC + MANCHESTER AV + GABAY JJ + SAX NI
TRITIATED MOISTURE IN THE ATMOSPHERE SURROUNDING A NUCLEAR FUEL REPROCESSING PLANT
NEW YORK STATE HEALTH DEPARTMENT
6 PAGES, 2 FIGURES, 8 TABLES, 11 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 9(7), PAGES 341-346 (JULY 1968)

A NEW WIDE-AREA SAMPLING TECHNIQUE WAS USED TO COLLECT MORE THAN 700 TRITIATED MOISTURE SAMPLES OVER A 2-MONTH PERIOD FROM SEVEN SAMPLING LEGS RADIATING OUT FROM A FUEL REPROCESSING PLANT. THE HIGHEST TRITIUM LEVEL RECORDED WAS 26,400 PCI/LITER. THE DATA ARE REPORTED NOT SO MUCH FOR THEIR EPIDEMIOLOGIC VALUE AS FOR THEIR VALUE TO PUBLIC HEALTH AGENCIES CONTEMPLATING RADIOLOGICAL SURVEILLANCE AROUND NUCLEAR FACILITIES.

AVAILABILITY - U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, NATIONAL CENTER FOR RADIOLOGICAL HEALTH

*ATMOSPHERIC DIFFUSION + *SAMPLING + RADIOLOGICAL ASSISTANCE + *FUEL REPROCESSING + *SURVEILLANCE PROGRAM

027977
COOLEY RC
CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS
SAVANNAH RIVER LABORATORY
DPSPU-66-30-13 + CONF-680607-1 +. 15 PAGES, TABLES, MAY 1968, FROM 13TH ANNUAL HEALTH PHYSICS SOCIETY MEETING, DENVER, COLORADO

IN HEAVY-WATER-MODERATED REACTORS, TRITIUM IS FORMED AS NEUTRONS ARE ABSORBED BY THE HEAVY WATER. HAZARDS FROM TRITIUM RELEASED TO PERSONNEL ZONES DURING REPAIR AND MAINTENANCE OPERATIONS ARE MINIMIZED BY PROPER JOB EVALUATION AND SELECTION OF CORRECT PROTECTIVE EQUIPMENT. AT SAVANNAH RIVER PLANT, BASIC INFORMATION HAS BEEN DEVELOPED TO FACILITATE THIS PROCESS. DATA IS GIVEN RELATIVE TO BUILDUP OF TRITIUM IN MODERATOR, AIRBORNE CONCENTRATION OF TRITIUM, CONCENTRATION OF TRITIUM IN SPILLED MODERATOR AND WATER, ASSIMILATION OF TRITIUM BY PERSONNEL THROUGH INHALATION AND BODY CONTACT, AND DOSE RECEIVED BY URINE ANALYSIS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*REACTOR, HWR + INHALATION + *ANALYTICAL TECHNIQUE + HAZARDS ANALYSIS + RADIATION SAFETY AND CONTROL + SORPTION + *MONITORING SYSTEM, RADIATION + CONCENTRATION + EXCRETION, URINE + MAN

028116
PAYNE BR + THATCHER LL + CAMERON JF + FLORKOWSKI T
THE MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO METEOROLOGY AND HYDROLOGY. FINAL REPORT
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
IAEA-3162-1 +. 119 PAGES, MAY 1967

THE RESEARCH CONTRACT WAS IN EFFECT BETWEEN THE U.S. ATOMIC ENERGY COMMISSION AND THE AGENCY FROM 1 JANUARY 1963 TO 31 DECEMBER 1965. THE AIM OF THE PROJECT MAY BE DEFINED BROADLY AS THE DEVELOPMENT OF ROUTINE METHODS FOR THE ANALYSIS OF ENVIRONMENTAL LEVELS OF TRITIUM IN NATURAL WATERS, AND, THROUGH THE JOINT PROGRAMME OF PRECIPITATION SAMPLING THROUGHOUT THE WORLD CARRIED OUT BY THE AGENCY IN COLLABORATION WITH WMO, THE PROVISION OF AN OVERALL PICTURE OF THE GLOBAL OCCURRENCE OF TRITIUM IN PRECIPITATION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

HYDROGEN + IAEA + OXYGEN + STRATOSPHERE + *WATER + *PRECIPITATION + METEOROLOGY + *MONITORING PROGRAM, ENVIRONMENTAL

029905
SECTION II - WATER - RADIOLOGICAL HEALTH DATA REPORTS
9 PAGES, FIGURES, TABLES, REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 9(10), PAGES 561-569 (OCTOBER 1968)

THE PUBLIC HEALTH SERVICE, THE FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, AND OTHER FEDERAL, STATE, AND LOCAL AGENCIES OPERATE EXTENSIVE WATER QUALITY SAMPLING AND ANALYSIS PROGRAMS FOR SURFACE, GROUND, AND TREATED WATER. MOST PROGRAMS INCLUDE DETERMINATION OF GROSS BETA AND GROSS ALPHA RADIOACTIVITY AND SPECIFIC RADIONUCLIDES.

FRC + RIVER + SAMPLING + *SURFACE WATER, NUCLIDE OCCURRENCE + ANALYTICAL TECHNIQUE + *WATER, DRINKING + RADIATION PROTECTION, ORGANIZATION + *WATER POLLUTION + *SURVEILLANCE PROGRAM

030348
SECTION II. WATER
RAD. HEALTH DATA AND REPORTS, VOL 9(11), NOV., 1968, P.659

THE PUBLIC HEALTH SERVICE, THE FEDERAL WATER POLLUTION CONTROL ADMINISTRATION AND OTHER FEDERAL, STATE, AND LOCAL AGENCIES OPERATE EXTENSIVE WATER-QUALITY SAMPLING AND ANALYSIS PROGRAMS FOR SURFACE, GROUND, AND TREATED WATER. MOST OF THESE PROGRAMS INCLUDE DETERMINATIONS OF GROSS BETA,

030348 *CONTINUED*
GROSS ALPHA, AND SPECIFIC RADIONUCLIDES.

FRC + MPC + *RIVER + STRONTIUM + *SAMPLING + *SURFACE WATER, NUCLIDE OCCURRENCE + ANALYTICAL TECHNIQUE + *WATER, DRINKING + GROSS BETA + *WATER POLLUTION + *SURVEILLANCE PROGRAM

031269
GOTCHY RL
PROJECT RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE) PRODUCTION TESTS
NEVADA OPERATIONS OFFICE, LAS VEGAS, NEVADA
NVO-112 + PNE-R-57 +. 74 PAGES, 5 TABLES, FEBRUARY 1972

SUMMARIZES MOST OF THE SIGNIFICANT RADIOLOGICAL SURVEILLANCE DATA GENERATED DURING THE PRODUCTION TESTS OF PROJECT RULISON, A NUCLEAR GAS STIMULATION EXPERIMENT, DETONATED SEPTEMBER 10, 1969, IN NORTHWESTERN COLORADO. ALSO INCLUDES DATA ON THE RADIOCHEMICAL AND CHEMICAL QUALITY OF THE RULISON GAS DURING THE TESTS, AND ESTIMATES OF THE QUANTITIES OF 3H, 85KR, 14C, AND 203HG RELEASED TO THE ATMOSPHERE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON + KRYPTON + MERCURY + MONITOR, LIQUID + MONITOR, AIR + MONITOR, GAS + *NUCLEAR DETONATION + MONITOR, BACKGROUND + RADIOACTIVITY RELEASE + *SURVEILLANCE PROGRAM + *MONITOR, AREA + *GAS + CONCENTRATION + *STIMULATION + BENEFIT VS RISK + BENEFICIAL USE

032537
ENVIRONMENTAL RESEARCH BRANCH PROGRESS REPORT, JULY 1 TO SEPTEMBER 30, 1968
ATOMIC ENERGY CANADA LTD., CHALK RIVER (ONTARIO)
AECL-3199 +. 12 PAGES, 3 FIGURES, PP. 15-26, NOVEMBER 1968

MONITORING OF OFF-SITE LIQUID DISPOSAL AREA AND EFFLUENTS CONTINUED AND A SURVEY SUMMARY GIVEN. STUDIES ARE REPORTED ON FATE OF FISSION PRODUCTS IN AQUATIC COMMUNITIES. RESULTS OF TRITIUM AND DEUTERIUM IN RAIN, SNOW, AND RIVER WATERS IS REPORTED. ROUTINE MONITORING OF THE STACK AND ATMOSPHERIC DIFFUSION CONTINUED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

CESIUM + *DEUTERIUM + *ATMOSPHERIC DIFFUSION + *EFFLUENT + *SILICON + STACK + *MONITOR, ENVIRONMENTAL + *SURVEY, RADIATION + WASTE DISPOSAL, LIQUID + HYDROLOGY + METEOROLOGY + RADIOBIOLOGY + *CONCENTRATION + AQUATIC ORGANISM

032538
HEALTH PHYSICS BRANCH PROGRESS REPORT, JULY 1 TO SEPTEMBER 30, 1968
ATOMIC ENERGY OF CANADA LTD., CHALK RIVER (ONTARIO)
AECL-3199 +. 13 PAGES, PP. 27-39, NOVEMBER 1968

REPORTS PROGRESS IN DETECTION INSTRUMENTS (NEUTRON DOSIMETRY, TRITIUM, IODINE). SOME DETAIL IS GIVEN AN ALPHA AIR MONITORING, INSTRUMENT DEVELOPMENT FOR COBALT-60, URANIUM AND REACTOR POWER LEVEL DETECTORS. BRIEF DATA ARE REPORTED OF WAVE LEVELS AT PERCH LAKE, RADIATION HAZARDS FROM X-RAY SOURCES, DEVELOPMENT OF LOUD ALARMS, AND ROUTINE DOSE AND FILM MONITORING.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

COBALT + *DOSIMETRY + *IODINE + ALPHA EMITTER + *URANIUM + RADIATION SAFETY AND CONTROL + *REACTOR POWER + X-RAY + NEUTRON + GAMMA EMITTER + RADIATION MONITORS

032834
SURVEY OF ENVIRONMENTAL REACTIVITY
RURAL COOPERATIVE POWER ASSOCIATION
COO-651-72 +. 38 PAGES, FIGURES, TABLES, APRIL 1969

DEALS WITH SURVEILLANCE PROGRAMS BY THE MINNESOTA DEPT. OF HEALTH AND THE RURAL COOPERATIVE POWER ASSOCIATION, ELK RIVER, MINN. RESULTS ARE REPORTED FOR GROSS BETA PEAK PERIODS AND THE GENERAL TRENDS OF RADIOACTIVITY IN PRECIPITATION, SURFACE WATERS, AND AIR DURING THE PERIOD 1961 THROUGH 1968. THE CONTRIBUTION OF SOME MAJOR ISOTOPES ARE GIVEN.

REACTOR, BWR + *CESIUM + *ELK RIVER (BWR) + *IODINE + PARTICLE + RIVER + *STRONTIUM + *SURFACE WATER, NUCLIDE OCCURRENCE + SURVEY, USPHS + AIR + *MILK + WATER, DRINKING + *GROSS BETA + PRECIPITATION + *SURVEILLANCE PROGRAM

033090
ANDERSON K
TRITIUM IN NEW YORK STATE WATERS, 1965
5 PAGES, 3 FIG., 3 TAB., 2 REF., PAGES 93 THRU 97 OF RADIOLOGICAL HEALTH DATA AND REPORTS, 10(3) (MARCH 1969)

THE STATES MAJOR RIVERS, CREEKS, AND LAKES WERE SAMPLED TO SEE WHAT VARIATIONS IN TRITIUM CONTENT

033090 *CONTINUED*
OCCURRED THROUGHOUT THE STATE. SINCE MOST TRITIUM IN THE ATMOSPHERE FROM NUCLEAR WEAPONS PROBABLY REACHES THE SURFACE WATERS IN PRECIPITATION, ONE WOULD EXPECT THAT RUNNING WATER, SUCH AS IN CREEKS AND RIVERS (MADE UP OF RECENT PRECIPITATION RUNOFF) MAY BE HIGHER IN TRITIUM THAN LARGE, DEEP LAKES THAT CONTAIN OLDER WATER, THUS PROVIDING GREATER DILUTION.

DILUTION + FALLOUT + *RIVER + TESTING + *SURFACE WATER, NUCLIDE OCCURRENCE + NUCLEAR DETONATION + *PRECIPITATION + WASHOUT + *SURVEILLANCE PROGRAM + *LAKE

034486
HERCEG JE
ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY, JANUARY THROUGH JUNE 1971
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-4871 +. 44 PAGES, FIGURES, TABLES, 19 REFERENCES, JUNE 1971

RESULTS OF PROGRAMS DESIGNED TO MONITOR RADIATION LEVELS IN THE LABORATORY ENVIRONS, INCLUDING THE ATMOSPHERE, LOCAL SURFACE AND GROUND WATERS, SEDIMENTS, AND SOILS ARE PRESENTED. THESE MEASUREMENTS ARE USED TO MAKE ESTIMATES OF THE DOSE COMMITMENTS DUE TO PLUTONIUM AND TRITIUM CONCENTRATIONS IN AIR. APPENDICES DESCRIBE THE BOUNDARIES OF THE LABORATORY SITE; THE PROGRAMS ASSOCIATED WITH VARIOUS LABORATORY TECHNICAL AREAS; GEOLOGIC, CLIMATOLOGIC, AND ECONOMIC CHARACTERISTICS OF THE LOS ALAMOS AREA; AND LABORATORY PROCEDURES USED FOR ANALYSIS OF SAMPLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + GEOLOGY + GROUND WATER + MEASUREMENT + *PLUTONIUM + SURFACE WATER + *SITE CLIMATOLOGY + AIR + ANALYTICAL TECHNIQUE + *MONITOR, ENVIRONMENTAL + *LASL + MONITOR + SOIL + *MONITOR, AREA + CONCENTRATION + SEDIMENT

035384
RADIOLOGICAL HEALTH DATA
U.S. PUBLIC HEALTH SERVICE
278 PAGES, RADIOLOGICAL HEALTH DATA AND REPORT, 10(6), (JUNE 1969)

PRESENTS DATA ON MILK AND FOOD, WATER, AIR AND DEPOSITION, BIOLOGICAL MATERIALS AND OTHER MEDIA.

BARIUM + CESIUM + *DEPOSITION + IODINE + PARTICLE + STRONTIUM + *WATER + SAMPLING + SURVEY, USPHS + *AIR + ANALYTICAL TECHNIQUE + *MILK + DIETARY HABIT + MONITOR, ENVIRONMENTAL + GROSS ALPHA + GROSS BETA + GROSS GAMMA + *WASTE MANAGEMENT + PRECIPITATION + ENVIRONMENT + *SURVEILLANCE PROGRAM + ANIMAL + *CONCENTRATION + FOOD

036421
DENHAM DH
RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1968
BATTELLE NORTHWEST
BNWL-1047 +. 20 PAGES, 3 FIGURES, 5 TABLES, 6 REFERENCES, MAY 1969

REPORT EVALUATES THE STATUS OF GROUND-WATER CONTAMINATION RESULTING FROM DISPOSAL OF PLANT EFFLUENTS. CONCENTRATIONS OF RUTHENIUM AND TRITIUM IN AREA IS GIVEN. CONTAMINATION IN CONFINED GROUND WATER IS REPORTED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*EFFLUENT + MPC + RUTHENIUM + *GROUND WATER, NUCLIDE OCCURRENCE + *WASTE DISPOSAL, LIQUID + CONTAMINATION + *HANFORD SITE

036537
PORTER NS + SPEAR WG
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION
BATTELLE NORTHWEST, RICHLAND, WASHINGTON
BNWL-1051(PT. 3) +. 48 PAGES, 3 FIGURES, 1 TABLE, JULY 1969

DISCUSSES INSTRUMENTS USED IN VARIOUS MONITORING METHODS AND TECHNIQUES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*BIOMEDICAL + COUNTER + SOLID STATE DEVICE + RADON + RADIATION SAFETY AND CONTROL + BATTELLE NORTHWEST + *RADIOBIOLOGY + INSTRUMENTS, MISC.

036604
ANDERSON HF + SHEEHAN WE
ENVIRONMENTAL MONITORING REPORT - JANUARY-JUNE 1969
MOUND LABORATORY, OHIO
MLM-1615 +. 41 PAGES, 4 FIGURES, AUGUST 21, 1969

036604 *CONTINUED*
THE CONCENTRATION OF RADIOACTIVE MATERIALS DETECTED IN THE ENVIRONMENT SURROUNDING MOUNT LABORATORY, MIAMISBURG, OHIO, IS PRESENTED FOR THE FIRST HALF OF 1969. THE AVERAGE CONCENTRATION OF RADIONUCLIDES FROM MOUND LABORATORY IN THE GREAT MIAMI RIVER AND IN THE ENVIRONMENTAL AIR WAS WITHIN THE STRINGENT STANDARDS OF SAFETY SPECIFIED BY THE ATOMIC ENERGY COMMISSION.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

ADMINISTRATIVE CONTROL + CODES AND STANDARDS + GUIDE + PLUTONIUM + *RIVER + SAMPLING + *SURFACE WATER, NUCLIDE OCCURRENCE + *AIR + *MONITOR, ENVIRONMENTAL + MOUND LABORATORY + RADIATION SAFETY AND CONTROL + METEOROLOGY + OFF SITE

039936
SURVEY OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER FOR JANUARY THROUGH JUNE 1969
MINNESOTA DEPARTMENT OF HEALTH + RURAL COOPERATIVE POWER ASSOCIATION
COO-651-81 +. 38 PAGES, RADIOACTIVITY REPORT, JUNE 1969, DOCKET 115-1, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

DESCRIBES THE SURVEY METHODS AND DATA OBTAINED FOR ANIMALS, AIR, SURFACE WATER, PRECIPITATION, MILK. LISTS TRITIUM ACTIVITY OF SURFACE WATER THROUGHOUT MINNESOTA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVITY BUILDUP + REACTOR, BWR + ELK RIVER (BWR) + SURFACE WATER, NUCLIDE OCCURRENCE + AIR + ENVIRONMENT + *MONITORING PROGRAM, ENVIRONMENTAL + DOWNWASH

042951
DENHAM DH
RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT, JAN.-JUNE 1969
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-1233 +. 20 PAGES, 3 FIGURES, 6 TABLES, 5 REFERENCES, NOVEMBER 1969

EVALUATES GROUND WATER SURVEILLANCE DATA OF BETA, TRITIUM, AND NITRATE ION CONCENTRATIONS IN WATER AROUND AND BENEATH THE HANFORD PLANT.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

RUTHENIUM + SOIL, RADIONUCLIDE MOVEMENT THROUGH + WASTE DISPOSAL + *GROUND WATER, NUCLIDE OCCURRENCE + RADIOLOGICAL ASSISTANCE + *HANFORD SITE + MONITORING SYSTEM, RADIATION + *SURVEILLANCE PROGRAM + NITRATE + CONCENTRATION

043090
REICHERT SO
RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES
E. I. DUPONT DE NEMOURS AND COMPANY, AIKEN, S.C.

DISPOSAL OF RADIOACTIVITY TO THE GROUND HAS BEEN LIMITED TO THE BURIAL OF SOLID WASTE AND THE DISCHARGE OF VERY-LOW-LEVEL WASTE TO OPEN SEEPAGE BASINS. NO RADIONUCLIDES HAVE BEEN DETECTED IN GROUNDWATER FROM THIS SOURCE. SEEPAGE BASIN RETENTION OF RADIONUCLIDES HAS BEEN LESS SATISFACTORY. ALL OF THE RADIONUCLIDES RELEASED TO THE SEEPAGE BASINS, EXCEPT PLUTONIUM, HAVE BEEN DETECTED IN THE SURROUNDING GROUNDWATER. TRITIUM IS NOT ABSORBED AND THUS SERVES AS A USEFUL GROUNDWATER TRACER. STRONTIUM 90 IS POORLY ADSORBED ON LOCAL SOIL AND IS DETECTABLE IN SAND LAYERS, AT CONCENTRATIONS LESS THAN THE RADIOACTIVITY CONCENTRATION GUIDE, AS FAR AS 500 FEET FROM THE BASINS. THE PATH OF RADIONUCLIDE MIGRATION FROM SEEPAGE BASINS IS DETERMINED BY THE GEOLOGY AND HYDROLOGY OF EACH AREA.

ADSORPTION + GUIDE + GEOLOGY + *STRONTIUM + TRACER, RADIOACTIVE + *WASTE DISPOSAL, TERRESTRIAL + GROUND WATER, NUCLIDE OCCURRENCE + *SAVANNAH RIVER PLANT + HYDROLOGY + *SURVEILLANCE PROGRAM + MONITOR, AREA + CONCENTRATION

043099
ODEN S
THE OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA, WITH APPLICATIONS IN SOIL SCIENCE AND HYDROLOGY
INSTITUTIONEN FOER MARKLAERA, UPPSALA
21 PAGES, GRUNDFORBATTRING, VOL. 17, PP. 122-142 (1964)(IN SWEDISH)

AN ARTIFICIAL LABELING BY C-14 AND TRITIUM HAS OCCURRED IN ALL NATURAL RESERVOIRS. AT THE INTERNATIONAL METEOROLOGICAL INSTITUTE IN STOCKHOLM, EFFORTS HAVE BEEN MADE TO FOLLOW THIS LABELING IN TIME AND SPACE AND TO UTILIZE IT IN COMPUTATIONS OF RESERVOIR CHARACTERISTICS SUCH AS TURNOVER TIME, EXCHANGE PROPERTIES, AND DAMPING AND MASS CHARACTERISTICS. IN ADDITION TO A GLOBAL NETWORK FOR ATMOSPHERIC TRITIUM ASSAYS, A FAIRLY DENSE NETWORK HAS BEEN SET UP OVER SCANDINAVIA, INCLUDING THE MONITORING OF BOTH ATMOSPHERIC TRITIUM AND SURFACE AND GROUND WATER TRITIUM FROM DIFFERENT RESERVOIRS. THESE DATA ARE DISCUSSED AND CORRELATED WITH THE LONG-TERM TRITIUM VARIATIONS AS SHOWN BY OTHER STATIONS IN NORTHERN EUROPE.

*CARBON + ECOLOGY + ATMOSPHERIC DIFFUSION, GLOBAL + GROUND WATER + *ATMOSPHERIC POLLUTION + *SURFACE WATER, NUCLIDE OCCURRENCE + *MONITOR, ENVIRONMENTAL + HYDROLOGY + ION EXCHANGE + SOIL + *SURVEILLANCE PROGRAM + TURNOVER RATE

043102
KIGOSHI K
NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS
GAKUSHUIN UNIVERSITY, TOKYO
A/AC.82/G/L.693 +. 4 PAGES, AUGUST 1961

KR (10 TO 50 ML) WAS COLLECTED AT TOKYO FROM LIQUID OXYGEN OBTAINED FROM A SMALL-SCALE NITROGEN LIQUEFIER. A REMARKABLE INCREASE IN THE CONCENTRATION OF ATMOSPHERIC KR-85 AFTER THE MIDDLE OF 1960 IS SHOWN. ATMOSPHERIC CO2 WAS COLLECTED AT TOKYO BY ABSORPTION IN NAOH SOLUTION, AND THE RADIOACTIVITY WAS MEASURED. TREE RINGS WERE ANALYZED FOR C-14 AND TRITIUM CONCENTRATIONS. THE CONCENTRATION OF C-14 AND OF TRITIUM IN THE TREE RING ARE REGARDED AS AN ANNUAL MEAN VALUE OF THE C-14 CONCENTRATION IN THE ATMOSPHERE AND OF THE TRITIUM CONCENTRATION IN RAIN WATER. THE CONCENTRATION OF ATMOSPHERIC C-14 HAD A MAXIMUM VALUE AT THE BEGINNING OF 1960, AND THE CONCENTRATION OF TRITIUM DECREASED AFTER 1959 WITH A HALF LIFE OF ABOUT ONE YEAR. THE DATA ARE TABULATED.

AVAILABILITY - USAEC DEPOSITORY LIBRARIES IN THE U.S. AND OVERSEAS

CRUSTACEAN + *CARBON + *KRYPTON + MEASUREMENT + *ATMOSPHERIC POLLUTION + SAMPLING + PRECIPITATION + BIOLOGICAL HALF-LIFE + *CONCENTRATION + PLANT, SPERMATOPHYTE

043805
CAMBRAY RS + FISHER EM + BROOKS WL + PIERSON DH
RADIOACTIVE FALLOUT IN AIR AND RAIN - RESULTS TO THE MIDDLE OF 1969
ATOMIC ENERGY RESEARCH ESTABLISHMENT, HARWELL (ENGLAND)
AERE-R-6212 +. 52 PAGES, NOVEMBER 1969

REPORTS SAMPLING OF DUST AND RAINWATER FROM THE UNITED KINGDOM AND ELSEWHERE. RESULTS ARE PRESENTED OF ANALYSES OF THESE SAMPLES FOR VARIOUS FISSION PRODUCTS AND CERTAIN OTHER RADIONUCLIDES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

CESIUM + DEPOSITION + *FALLOUT + MEASUREMENT + STRONTIUM + *UNITED KINGDOM + *PRECIPITATION + *SURVEILLANCE PROGRAM + *CONCENTRATION

044009
WATSON GM
THE ENVIRONMENTAL MONITORING PROGRAMME AT THE A.A.E.C. RESEARCH ESTABLISHMENT, LUCAS HEIGHTS
AUSTRALIAN ATOMIC ENERGY COMMISSION, SYDNEY, AUSTRALIA
A/CONF/49/P/800 +. 20 PAGES, 2 FIGURES, 1 TABLE, 5 REFERENCES, FROM THE FOURTH UNITED NATIONS INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, GENEVA, SEPTEMBER 6-16, 1971

DESCRIBES THE EVOLUTION OF EFFLUENT DISCHARGE FORMULAE, AND THE ASSOCIATED ENVIRONMENTAL MONITORING, AT THE AUSTRALIAN ATOMIC ENERGY COMMISSION'S RESEARCH ESTABLISHMENT NEAR SYDNEY, OVER THE PAST TEN YEARS. ITS MAJOR RESEARCH FACILITY IS A 10 MW (TH) HEAVY WATER MODERATED AND COOLED MATERIALS TESTING REACTOR, WHICH IS ALSO USED FOR EXTENSIVE RADIOISOTOPE PRODUCTION. *** POSSIBLE SOURCES OF ENVIRONMENTAL CONTAMINATION ARE ATMOSPHERIC, FROM ISOTOPE PRODUCTION FACILITIES AND REACTOR TRITIUM, ESTUARINE FROM THE DISCHARGE OF LOW-LEVEL LIQUID EFFLUENT TO A TIDAL STREAM, AND LEACHING FROM A BURIAL GROUND FOR LOW-LEVEL SOLID WASTES. DISCHARGE AUTHORISATIONS DERIVE FROM CRITICAL GROUP STUDIES, WITH OYSTER CONSUMPTION THE MOST SIGNIFICANT PATHWAY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CODES AND STANDARDS + EFFLUENT + REACTOR, MWR + REGULATION + RIVER + *WASTE DISPOSAL, TERRESTRIAL + *AUSTRALIA + *MONITOR, ENVIRONMENTAL + *CRITICAL NUCLIDE PATHWAY + CONTAMINATION + *RADIATION SAFETY AND CONTROL + *FOOD CHAIN + *AQUATIC ORGANISM + *LEACHING

044669
MOGHISSI AA + PORTER CR
TRITIUM CONCENTRATION IN PRECIPITATION, 1967-1968
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY
4 PAGES, 3 FIGURES, 2 TABLES, 8 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 11(3), PG 137-130 (MARCH 1970)

DISCUSSES A SURVEILLANCE PROGRAM TO DETERMINE THE AMOUNT OF TRITIUM IN RAIN.

*SAMPLING + MONITOR, BACKGROUND + *PRECIPITATION + SURVEILLANCE PROGRAM + DATA COLLECTION + *CONCENTRATION

044832
ESSINGTON EH + FENSKE PR + NORK WE
RADIOACTIVITY IN WATER - PROJECT MILROW
ISOTOPES, INC., PALO ALTO, CALIFORNIA
NVO-1229-135 +. 45 PAGES, MARCH 1970

DISCUSSES POST-MILROW EVENT CONDITIONS AT AMCHITKA RELATIVE TO EXPLOSION-PRODUCED RADIOACTIVITY IN WATER. EXPLOSION EFFECTS WHICH ARE RELATED TO MODIFICATION OF THE HYDROLOGIC SYSTEM ARE - (1)

044832 *CONTINUED*
FORMATION OF A RUBBLE CHIMNEY AND COLLAPSE SINK, (2) FORMATION OF WATER SPOUTS ON THE ISLAND AND IN THE OCEAN DURING THE SEISMIC PHASE, (3) CREATION OF LINEATIONS IN THE OCEAN POSSIBLY RELATED TO FAULT AND FRACTURE SYSTEMS DURING THE SEISMIC PHASE, (4) FORMATION OF A LONG OPEN FRACTURE ABOUT 300 METERS FROM GROUND ZERO THAT ACTED AS A DRAIN FOR SURFACE WATER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DILUTION + OCEAN AND SEA + *PLOWSHARE + SEISMOLOGY + SOIL, RADIONUCLIDE MOVEMENT THROUGH + SURFACE WATER + MONITOR, BACKGROUND + *HYDROLOGY + *TRANSPORT THEORY + *MODEL TESTING + *SURVEILLANCE PROGRAM

045385
MOGHISSI AA + LYON RJ
TRITIUM CONCENTRATIONS IN FOOD, 1967-1968
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY + SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY
4 PAGES, 2 FIGURES, 4 TABLES, 9 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 11(5), PG 233-236 (MAY 1970)

TRITIUM CONCENTRATIONS WERE DETERMINED IN FOOD SAMPLES OBTAINED FROM SEVERAL CHILDRENS HOMES IN THE UNITED STATES. THE AVERAGE CONCENTRATIONS OF TRITIUM IN FOOD INDICATE A DECREASING TREND FROM 1967 TO 1968. THE AVERAGE DOSE EQUIVALENT FROM TRITIUM IN FOOD WAS CALCULATED TO BE 0.08 MREM FOR 1967 AND 0.03 MREM FOR 1968.

DOSE + *DIETARY HABIT + UNITED STATES + CONCENTRATION + *FOOD CHAIN + MAN + FOOD

048324
RADIOLOGICAL HEALTH DATA
34 PAGES, RAIOLOGICAL HEALTH DATA AND REPORTS, 11(7), PG 333-366 (JULY 1970)

REPORTS SURVEILLANCE DATA ON MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA CONCERNED WITH ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT ATOMIC ENERGY COMMISSION INSTALLATIONS.

*DEPOSITION + ELEMENTS AND ISOTOPES + PARTICLE + STRONTIUM + *WATER + SURFACE WATER, NUCLIDE OCCURRENCE + *AIR + *MILK + DIETARY HABIT + WATER, DRINKING + *CONCENTRATION, AREA + FISSION PRODUCT, AIRBORNE + PRECIPITATION + *SURVEILLANCE PROGRAM + *CONCENTRATION + AGENCY, AEC + FOOD

051272
IAEA
TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1
WP/17/1 + WP/17/2 + WP/17/3 + WP/17/4 + WP/17/5 + WP/17/1-5 + WP/17/6 +.

OCEAN AND SEA + RIVER + WATER + SAMPLING + PRECIPITATION + CONCENTRATION

051297
ASHLEY C
EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JULY THROUGH DECEMBER 1963.
DPSPU-64-30-1 + DPSPU-64-30-2 + DPSPU-65-30-1 + DPST-65-30-2 + DPST-66-30-1 + DPST-66-30-2 +.

CERIUM + CESIUM + COBALT + RIVER + RUTHENIUM + STRONTIUM + ZIRCONIUM + CHROMIUM + MANGANESE + NEPTUNIUM + SAVANNAH RIVER PLANT + RADIOISOTOPE + ENVIRONMENT + EFFECT + TRANSPORT + PLANT + FOOD INTAKE

051305
REICHERT SO
RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES.
JOURNAL OF GEOPHYSICAL RESEARCH 67 PAGES 4363-4374 1962

GROUND WATER + RIVER + WASTE DISPOSAL + SAVANNAH RIVER PLANT + RADIOISOTOPE + TRANSPORT + PLANT

051441
TAYLOR CB
TRITIUM MEASUREMENTS IN NATURE. A REVIEW OF THE WORK OF THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, NEW ZEALAND.
INS-R-24 +.

CARBON + MEASUREMENT + OCEAN AND SEA + WATER + PRECIPITATION + NEW ZEALAND + REVIEW

052994
STEBBINS AK
HASP. SECOND SPECIAL REPORT ON HIGH ALTITUDE SAMPLING PROGRAM.
DASA-539-B +.

BARIUM + BERYLLIUM + CARBON + CERIUM + CESIUM + ATMOSPHERIC DIFFUSION, CLIMATOLOGY + STRONTIUM + ATMOSPHERIC CIRCULATION + LEAD + SAMPLING + TUNGSTEN + RHODIUM + HIGH + RADIONUCLIDE TRANSFER + TRANSPORT

053221
HAZLETON-NUCLEAR S
VELA UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.
VUF-1014 +.

GROUND WATER + TRANSPORT

053240
TAKAHASHI T
MEASUREMENT OF TRITIUM IN RAIN, CITY WATER, GROUND WATER AND HOT SPRINGS.
JOURNAL OF THE SCIENTIFIC RESEARCH INSTITUTE/TOKYO 59 PAGES 49-51 1965

MEASUREMENT + WATER + PRECIPITATION

053772
KORANDA JJ
RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.
UCRL-50360 +.

PLOWSHARE + SOIL + CANAL

054494
BROWN RM
TRITIUM IN PRECIPITATION AT CANADIAN SITES (1953-1963).
STI/DOC/10/73 +.

CANADA + SITING + PRECIPITATION

054496
TAYLOR CB
TRITIUM IN SOUTHERN HEMISPHERE PRECIPITATION (1953-1964).
STI/DOC/10/73 +.

PRECIPITATION

055973
MULLINS JW + STEIN JL
EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968-DEC. 1969
WESTERN ENVIRONMENTAL RESEARCH LABORATORY, LAS VEGAS, NEVADA + SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY
9 PAGES, 3 FIGURES, 1 TABLE, 9 REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORTS, 13(2), PP. 59-67 (FEBRUARY 1972)

TO ESTABLISH A BASELINE FOR ENVIRONMENTAL TRITIUM A STUDY WAS CONDUCTED TO MEASURE CURRENT LEVELS OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES. DATA ARE REPORTED FOR TRITIUM CONCENTRATIONS IN SURFACE AND GROUND WATERS DURING APRIL 1968-DECEMBER 1969. THE CONCENTRATION OF TRITIUM WAS NONDETECTABLE IN MOST GROUND-WATER SAMPLES, WHILE OTHER SAMPLES CONTAINED AS MUCH AS 2.6 NCI/LITER. SURFACE WATER SAMPLES RANGED FROM NONDETECTABLE TO 3.8 NCI/LITER. POSSIBLE REASONS FOR THE RANGE OF RESULTS, SUCH AS ALTITUDE AND LATITUDE EFFECTS, ARE DISCUSSED.

SAMPLING, HIGH ALTITUDE + *ANALYTICAL TECHNIQUE + *MONITOR, ENVIRONMENTAL + *GROUND WATER, NUCLIDE OCCURRENCE + *MONITOR, GROUND SURFACE + UNITED STATES + *SURVEILLANCE PROGRAM + *CONCENTRATION

056139
ENVIRONMENTAL SURVEILLANCE FOR PROJECT GASBUGGY PRODUCTION TEST PHASE
BUREAU OF RADIOLOGICAL HEALTH, ROCKVILLE, MARYLAND
SWRHL-100R +. JUNE 1970

ENVIRONMENTAL SAMPLES COLLECTED WITHIN 10 MILES OF GASBUGGY CONTAINED H-3 RELEASED DURING PRODUCTION TESTING. SEVERAL SAMPLES HAD C-14 CONCNS. TO 3 TIMES BACKGROUND. EXCEPT FOR KR-85 IN 2 AERIAL SAMPLES, NO CONTAMINATION BY OTHER ISOTOPES WAS DETECTED. THE HIGHEST CONCON. OF H-3 IN AN AIR SAMPLE WAS 0.9 PERCENT OF THE MPC. SOIL AND VEGETATION CONCN. OF H-3 WAS HIGHEST IN NOV. 1968, AND WAS AT BACKGROUND BY OCT. 1969.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CARBON + KRYPTON + *PLOWSHARE + SURVEY, ENVIRONMENT + SOIL + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + PLANT

056180
MOGHISSIDAA + LYON RJ
TRITIUM CONCENTRATIONS IN FOOD, 1967-1968

056180 *CONTINUED*
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY + SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY
4 PAGES, RADIOLOGICAL HEALTH DATA AND REPORTS, VOL. 11, PG. 233-236 (1970)(T7210)

THE US PUBLIC HEALTH SERVICE MONITORS TRITIUM IN RAIN, SURFACE WATERS, FOOD AND URINE. TOTAL 24-HR FOOD INTAKES OF CHILDREN FROM SEVERAL CHILDRENS HOMES, INCLUDING SOFT DRINKS BUT EXCLUDING TAP WATER WERE ANALYZED FOR TRITIUM, AND NCI/LITER OF WATER OF COMBUSTION TABULATED FOR TAMPA, NEW ORLEANS, LITTLE ROCK, LOUISVILLE, ALBUQUERQUE, CHARLESTON, COLUMBIA AND AUSTIN. AVERAGE TRITIUM CONCNS IN FOOD RANGED FROM 0.34 NCI/LITER AT LITTLE ROCK (DOSE EQUIV OF 0.06 MREM) TO 0.71 AT LOUSIVILLE (0.12 MREM) IN 1967, THE CORRESPONDING FIGURES FOR 1968 BEING 0.13 AND 0.02 AT LITTLE ROCK, AND 0.26 AND 0.04 AT LOUISVILLE, ASSUMING A STANDARD MAN OF 70 KG WITH A HYDROGEN WHOLE BODY CONTENT OF 7 KG, DRINKING-WATER NOT INCLUDED, WITH A QUALITY FACTOR OF 1.7 FOR TRITIUM, AND THAT TIRITIUM CONCN OF THE BODY IS IN EQUILIBRIUM WITH THAT IN THE FOOD. FOR CHILDREN DOSE CALCULATION, SEE MOGHISSI AND LIEBERMAN, RADIOL HEALTH DATA REPTS 11, 227 (1970)

INGESTION + DIETARY HABIT + *DOSE CALCULATION, INTERNAL + UNITED STATES + RADIONUCLIDE UPTAKE + PHYSIOLOGY/METABOLISM + IMMATURE + MAN + *FOOD INTAKE + BODY BURDEN

056543
SUESS HE
MEASUREMENTS OF BOMB PRODUCED RADIOCARBONS IN THE SURFACE AND SUBSURFACE WATER OF THE PACIFIC OCEAN.
SCRIPPS INSTITUTION OF OCEANOGRAPHY, LA JOLLA, CALIFORNIA
UCSD-34-P-163-X-1 +. 17 PAGE, MARCH 1, 1970

REPORTS PROGRESS DURING THE YEAR 1970 OF THE LA JOLLA PROGRAM FOR MONITORING THE CARBON-14 CONTENT OF SURFACE SEAWATER IN THE PACIFIC OCEAN. ADDITIONAL PLANS OF SAMPLING AND THE MOVING OF THE LABORATORY ARE ALSO REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*CARBON + COUNTER + *SAMPLING + *SURVEILLANCE PROGRAM + CONCENTRATION + *OCEAN, PACIFIC

056741
HULL AP + GILMARTIN JT
1966 ENVIRONMENTAL MONITORING RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN NATIONAL LABORATORY
. BNL-50196 +. 32 PAGES, 20 FIGURES, 32 TABLES, 29 REFERENCES, SEPTEMBER 1969

MEASUREMENTS OF NATURAL BACKGROUND RADIATION LEVELS AND OF INCREMENTS ATTRIBUTABLE TO LABORATORY OPERATIONS OBTAINED ON SITE AND IN THE VICINITY OF BROOKHAVEN NATIONAL LABORATORY DURING 1966 ARE SUMMARIZED IN THIS REPORT. THESE INCREMENTS INLCUDE CONTRIBUTIONS FROM THE GASEOUS AND PARTICULATE EFFLUENTS FROM THE STACK SERVING THE BROOKHAVEN GRAPHITE RESEARCH REACTOR AND THE HIGH FLUX BEAM RESEARCH REACTOR, FROM MULTICURIE FIELD GAMMA SOURCES, AND FROM THE DISCHARGE OF LOW-LEVEL LIQUID WASTES FROM THE LABORATORYS SANITARY WASTE TREATMENT PLANT INTO THE HEADWATERS OF THE PECONIC RIVER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + COBALT + *EFFLUENT + IODINE + PARTICLE + STRONTIUM + WASTE TREATMENT + STACK + MILK + *BNL + *MONITOR, ENVIRONMENTAL + GROSS BETA + GROSS GAMMA + *MONITOR, BACKGROUND + REACTOR + *GAS + OFF SITE + CONCENTRATION

057383
WYERMAN TA + FARNSWORTH RK + STEWAET GL
TRITIUM IN STREAMS IN THE UNITED STATES, 1961-1968
WATER RESOURCES DIVISION, U.S. GEOLOGICAL SURVEY + ENVIRONEMTNAL SCIENCES SERVICES ADMINISTRATION, MARYLAND + UNIVERSITY OF MASSACHUSETTS
19 PAGES, 20 TABLES, RADIOLOGICAL HEALTH DATA AND REPORTS, 11(9), PG 421-439 (SEPTEMBER 1970)

AS PART OF ITS PROGRAM OF WATER RESOURCES INVESTIGATIONS, THE U.S. GEOLOGICAL SURVEY HAS BEEN ANALYZING THE TRITIUM CONTENT OF STREAM WATER SINCE THE EARLY 1960S. THE RESULTS FOR 20 STREAMS IN THE COTERMINOUS UNITED STATES AND ALASKA ARE TABULATED ALONG WITH RELEVANT STREAM DISCHARGE DATA. THE DATA SHOW THE EFFECT ON STREAM TRITIUM CONCENTRATION CAUSED PRINCIPALLY BY THERMONUCLEAR DETONATIONS, AND ALSO SEASONAL, LATITUDINAL, AND CONTINENTAL EFFECTS.

*SURFACE WATER, NUCLIDE OCCURRENCE + HYDROLOGY + UNITED STATES + ALASKA + *SURVEY

058859
PROJECT GASBUGGY OFF-SITE RADIOLOGICAL SAFETY REPORT GB-2R PHASE I PROGRAM
SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY
SWRHL-105-R +. 20 PAGES, JULY 1970

THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY PROVIDED OFF-SITE RADIOLOGICAL SURVEILLANCE FOR THE GASBUGGY-2 REDRILL (BG-2R) - PHASE I PROGRAM. THIS SURVEILLANCE WAS THE CONTINUATION OF THE PREVIOUS OFF-SITE SURVEILLANCE PROGRAM FOR GASBUGGY, AND CONSISTED OF - OPERATING A DAILY AIR SAMPLING NETWORK, PLACING THERMOLUMINESCENT DOSIMETERS IN A NETWORK AROUND THE SITE, MONITORING FOR RADIOACTIVITY, TAKING SPECIAL AIR SAMPLES DURING FLARING OPERATIONS, COLLECTING WATER, VEGETATION, AND SOIL SAMPLES AFTER COMPLETION OF TESTING OPERATIONS. THE ONLY RADIOACTIVITY ABOVE BACKGROUND LEVELS DETECTED OFF-SITE WAS IN SPECIAL AIR SAMPLES. THESE SAMPLES CONTAINED

058859 *CONTINUED*
TRITIUM CONCENTRATIONS ABOVE BACKGROUND; THE CONCENTRATIONS FOUND PRESENTED NO HAZARD TO ANY PEOPLE OR LIVESTOCK LIVING IN THE OFF-SITE AREA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*PLOWSHARE + *WATER + *SAMPLING + AIR + *MONITOR, ENVIRONMENTAL + SOIL + *SURVEILLANCE PROGRAM + *GAS + OFF SITE + VEGETATION + CONCENTRATION

060609
AN ECOLOGICAL APPROACH
UNIVERSITY OF FLORIDA, GAINESVILLE
23 PAGES, 4 FIGURES, 2 TABLES, QUARTERLY PROGRESS REPORT, AUGUST 1 - OCTOBER 31, 1970

PREOPERATIONAL INVESTIGATION OF THE LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE CRYSTAL RIVER NUCLEAR POWER PLANT. PROGRESS IS REPORTED IN MARINE AND MARSHLAND SAMPLING, TERRESTRIAL SAMPLING, CS-137 IN THE FLORIDA BIOSPHERE, THERMOLUMINESCENT DOSIMETRY, AIRBORNE PARTICULATE ACTIVITY, TOTAL DEPOSITION SAMPLER, TRITIUM NETWORK, AND EVALUATION OF SPANISH MOSS AS A BIOLOGICAL SAMPLER FOR AIRBORNE ACTIVITY.

AVAILABILITY - ENVIRONMENTAL ENGINEERING, UNIVERSITY OF FLORIDA, GAINESVILLE, FLORIDA 32601

CESIUM + NIOBIUM + ZIRCONIUM + SURFACE WATER, NUCLIDE OCCURRENCE + *FISSION PRODUCT, AIRBORNE + *ECOSYSTEM, GRASSLAND + RADIONUCLIDE UPTAKE + ANIMAL, INVERTEBRATE + BIOACCUMULATION/TURNOVER + FOOD CHAIN + PLANT, SPERMATOPHYTE + MARINE ORGANISM + MAMMAL + PLANT, ALGAE/FUNGI + *ECOSYSTEM, MARINE + ANIMAL, AMPHIBIAN + ANIMAL, REPTILE + ANIMAL, BIRD + PLANT, MOSS/FERN

061130
BASSON JK + VANAS D + VLEGGAAR CM + VANDERWESTHUSIZEN
RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE
11 PAGES, SOUTH AFRICAN JOURNAL OF SCIENCE, 66(7), PP. 214-225

MEASUREMENTS SINCE 1963 WITH SPECIAL ATTENTION TO 1966-67 SHOWED THE FRENCH NUCLEAR TESTS DID NOT PRODUCE A HAZARDOUS INCREASE. ANALYSES OF AIRBORNE FALLOUT, SR-90 IN MILK, CS-137 IN BONE. TRANSIT TIME AND AGE ANALYSIS, THE RATIO OF CE-144/CS-137 INDICATED FALLOUT AGE, AND SHOWED FALLOUT TOWARDS THE END OF 1966. INCREASES IN CUMULATIVE SR-90 DEPOSITION AND H-3 IN RAIN WERE ATTRIBUTABLE TO INTERHEMISPHERIC MIXING. THE AVERAGE DOSE RATE FOR THE POPULATION WAS CALCD. TO BE 0.9 MRAD/YEAR TO GONADS AND 3.3 TO THE BONE MARROW. (CA 74-10119 N)

CERIUM + CESIUM + *FALLOUT + STRONTIUM + DOSE CALCULATION, INTERNAL + *POPULATION EXPOSURE + *SOUTH AFRICA + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + BONE, MARROW + TESTIS

061408
ENVIRONMENTAL MONITORING REPORT - JANUARY-JUNE 1970
MOUND LABORATORY, MIAMISBURG, OHIO
MLM-1784 +. 36 PAGES, JANUARY 25, 1971

THE AVERAGE CONCENTRATIONS OF POLONIUM-210, PLUTONIUM-238 AND TRITIUM DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO, ARE PRESENTED FOR THE FIRST HALF OF 1970. THE AVERAGE CONCENTRATIONS OF THESE RADIOISOTOPES IN THE GREAT MIAMI RIVER AND AT THE AIR SAMPLING STATIONS WERE WELL WITHIN THE STRINGENT STANDARDS ADOPTED BY THE ATOMIC ENERGY COMMISSION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*PLUTONIUM + RIVER + *POLONIUM + AIR + *MONITOR, ENVIRONMENTAL + *MOUND LABORATORY + REGULATION, AEC + *CONCENTRATION

061936
VINOGRADOV AP + DEVIRTS AL + DOBKINA EI
THE CURRENT TRITIUM CONTENTS OF NATURAL WATERS
INSTITUTE OF GEOCHEMISTRY AND ANALYTICAL CHEMISTRY, MOSCOW
15 PAGES, GEOCHEMSITRY INTERNATIONAL, VOL. 5, 952-966 (1968)

TRITIUM ANALYSES WERE MADE ON A NUMBER OF WATER AND PLANT SAMPLES COLLECTED PRIMARILY DURING 1966 TO 1968 IN THE WESTERN USSR. THE ANALYSES WERE MADE BY GAS-PROPORTIONAL COUNTER. THE COUNTERS WERE STEEL OR COPPER IN CONVENTIONAL STEEL SHIELDS WITH A RING OF GEIGER GUARD COUNTERS IN ANTICOINCIDENCE WITH THE MAIN COUNTER. RESULTS ARE GIVEN.

*WATER + ANALYTICAL TECHNIQUE + USSR + *MONITORING PROGRAM, ENVIRONMENTAL + *CONCENTRATION

062255
ESSIG TH
RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JANUARY-JUNE 1970
BATTELLE-NORTHWEST LABORATORY, RICHLAND, WASHINGTON
BNWL-1539 +. 23 PAGES, DECEMBER 1970

REPORTS EVALUATION OF THE STATUS OF GROUNDWATER CONTAMINATION RESULTING FROM DISPOSAL OF HANFORD

062255 *CONTINUED*
PLANT EFFLUENTS. THE DATA WERE COLLECTED DURING THE FIRST SIX MONTHS OF 1970.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + EFFLUENT + *GROUND WATER + RUTHENIUM + STRONTIUM + WASTE DISPOSAL + CHROMIUM + WATER, DRINKING + GROSS BETA + *HANFORD SITE + *MONITOR, AREA + NITRATE + *CONCENTRATION

064210
ENVIRONMENTAL MONITORING REPORT - JULY-DECEMBER 1970 AND 1970 SUMMARY
MOUND LABORATORY, MIAMISBURG, OHIO
MLM-1795 +. 51 PAGES, 9 TABLES, 14 FIGURES, APRIL 15, 1971

THE AVERAGE CONCENTRATIONS OF PO-210, PU-238, AND TRITIUM DETECTED IN THE ENVIRONMENT SURROUNDING MOUND LABORATORY, MIAMISBURG, OHIO, ARE PRESENTED FOR THE SECOND HALF OF 1970 AND FOR THE ENTIRE YEAR. THE AVERAGE CONCENTRATIONS OF THESE RADIOISOTOPES IN THE GREAT MIAMI RIVER AND THE AIR SAMPLING STATIONS WERE WELL WITHIN THE STRINGENT STANDARDS ADOPTED BY THE USAEC.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CODES AND STANDARDS + PLUTONIUM + RIVER + ATMOSPHERIC POLLUTION + POLONIUM + SAMPLING + *MONITOR, ENVIRONMENTAL + *MOUND LABORATORY + REGULATION, AEC + WATER POLLUTION + *CONCENTRATION

064274
SURVEILLANCE DATA FOR MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA
BUREAU OF RADIOLOGICAL HEALTH, MARYLAND
50 PAGES, FIGURES, TABLES, REFERENCES, RADIOLOGICAL HEALTH DATA AND REPORT, 12(5), PP. 253-303, MAY 1971

REPORTS SURVEILLANCE DATA FROM THE U.S., CANADA, PAN AMERICA, AND OTHER LOCATIONS. ALSO INCLUDES ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT ARGONNE NATIONAL LABORATORY AND THE LAWRENCE RADIATION LABORATORY.

CARBON + *DEPOSITION + ELEMENTS AND ISOTOPES + FALLOUT + FRC + *WATER + SURFACE WATER, NUCLIDE OCCURRENCE + *AIR + ANL + *MILK + DIETARY HABIT + GROUND WATER, NUCLIDE OCCURRENCE + LRL + PRECIPITATION + RADIOLOGICAL ASSISTANCE + *SURVEILLANCE PROGRAM + DATA COLLECTION + *CONCENTRATION + AGENCY, AEC + *FOOD

064768
REINING WC + ALBENESIUS EL
CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT
E.I. DU PONT DE NEMOURS & COMPANY, + SAVANNAH RIVER PLANT, AIKEN, SOUTH CAROLINA
7 PAGES, 13 REFERENCES, 3 TABLES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 24, PAGE 276-283, 1963, (T1782)

CF NSIC NO. 64766. TRITIUM IS PRODUCED AS AN UNWANTED BYPRODUCT FROM NEUTRON IRRAD OF D20 IN THE REACTORS, AND FROM LI IRRADIATION. NOMOGRAM OF MINUTES TO ASSIMILATE 1 MCI OF HTO VS AIR ACTIVITY IN UCI OF HTO/CC GIVEN FOR DIFFERENT TYPES OF MASK AND SUIT PROTECTION. STACK MONITORS GIVE CONTINUOUS RECORD OF H3 CONCNS. TRITIUM EXPOSURE RECORD AT SAVANNAH AS FOLLOWS - YEAR, NO. OF ASSAYS, H3 UPTAKE BETWEEN 0.37 AND 1.0 MCI, H3 UPTAKE GREATER THAN 1.0 MCI - 1954, 2190, -, 0 - 1955, 2310, -, 2 - 1956, 2230, -, 13 - 1957, 4000, -, 49 - 1958, 3600, 307, 33 - 1959, 2590, 156, 22 - 1960, 2720, 452, 79 - 1961, 2690, 401, 73. AT URINARY H3 CONCNS GREATER THAN 20 UCI/L IN 75 CASES THE BIOL HALF-LIFE AVERAGED 10 DAYS. MAX AVERAGE WEEKLY CONCN OF H3 IN MILK FROM 3 LOCAL DAIRIES AND 2 FARMS WAS 7 X 10 (EXP -6) UCI/CC. MAX AVERAGE WEEKLY CONCN IN DRINKING WATER WAS 13% OF LIMIT SUGGESTED BY ICRP FOR LARGE POPULATIONS. AVERAGE AIR CONCN WAS 0.5 UCI/CC X 10 (EXP -9), WITH WEEKLY MAX OF 6.8, AND RAINWATER AVERAGED 16 X 10 (EXP -6) WITH WEEKLY MAX OF 180. CF NSIC NOS. 49702, 49713, 56158 FOR ADDNL SAVANNAH RIVER DATA ON TRITIUM.

MPBB + OXIDE + WATER + AIR + MILK + MONITOR, ENVIRONMENTAL + SAVANNAH RIVER PLANT + POPULATION EXPOSURE + *PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + *EXCRETION, URINE + MAN + MATURE + EXPOSURE, BACKGROUND

064785
DROBINSKI JC + LAGATTA OP + GOLDIN AS + TERRILL JG
ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM
NORTHEASTERN RADIOLOGICAL HEALTH LABORATORY, DIVISION OF RADIOLOGICAL HEALTH, PUBLIC HEATLH SERVICE, WINCHESTER, MASSACHUSETTS
11 PAGES, 8 FIGURES, 4 TABLES, 35 REFERENCES, HEALTH PHYSICS, VOL. 11, PP. 385-395 (1965)(T1785)

1952 OFTEN USED AS BENCH-MARK FOR ASSESSING C14 LEVELS (START OF HIGH YIELD DEVICE TESTING), PRE-1952 BASELINE ESTIMATED AT 14 +-1 D/MIN/GM OF C IN BIOSPHERE, NSIC NO. 64786. MENEELY (1962) REPORTED 65% INCREASE OVER BACKGROUND (23 D/MIN/GM C) AS OF 1958. ASSUMING CESSATION OF ALL TESTING IN WORLD, SEVERAL CENTURIES WILL BE REQUIRED FOR ENVIRONMENTAL LEVELS TO RETURN TO PRE-1952 BACKGROUND, WHICH MAY OR MAY NOT BE OF GENETIC SIGNIFICANCE TO THE HUMAN RACE AND OTHER LIVING SYSTEMS. H3 LEVELS ARE MORE VARIABLE THAN C14, KAUFMAN (1953) REPORTING 3 TO 30 PCI/L AS PRE-1952 H3 LEVEL IN WATERS AND WINES. BIOSPHERE INCREASING TO 300 TO 50,000 PCI/L THEREAFTER, TRITIUM IN ATMOSPHERIC HYDROGEN GAS INCREASING FROM 430 PCI/GM OF HYDROGEN IN 1954 TO 29,000 IN 1962 (NSIC NO. 64787). FRC 3, 3(1962) CLAIMED THAT MUTATIONS EXPECTED FROM C14 OVER ALL TIME (THOUSANDS OF YRS) WILL BE GREATER THAN FOR ANY OTHER RADIONUCLIDE, BUT WITH FEWER MUTATIONS PER GENERATION. VALUES FOR BIOL HALF-LIFE OF C14 HAVE RANGED FROM 10 TO 180 DAYS, EXCLUSIVE OF THE 5% LONG-TERM COMPONENT IN BONE. BECAUSE OF SHORTER PHYSICAL HALF-LIFE, H3 NOT CONSIDERED AS

064785 *CONTINUED*
HAZARDOUS AS C14. PRESENT STUDY GIVES C14 AND H3 CONTENTS OF CANNED MEATS, AND 14 CONTENTS OF HUMAN LIVER, KIDNEY, HEART, BLOOD AND OF MILK, EGGS, POTATOES, APPLIES, ORANGES AND OF AIR IN VARIOUS CITIES FOR 1962-4. DATA TOO DETAILED FOR LIMITED SPACE HERE.

CARBON + FALLOUT + INGESTION + INHALATION + AIR + MILK + DIETARY HABIT + WATER, DRINKING + *POPULATION EXPOSURE + CORRELATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + VEGETATION + CONCENTRATION + DISTRIBUTION + BLOOD + BONE + EGG + KIDNEY + LIVER + MAN + FOOD INTAKE + *EXPOSURE, BACKGROUND + HEART

064789
KORANDA JJ
PRELIM STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC PROVING GROUND
BIO-MEDICAL DIVISION, LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
13 PAGES, 1 FIGURE, 9 TABLES, 12 REFERENCES, HEALTH PHYSICS, VOL. 11, PP. 1445-1457 (1965)(T1782)

CF NSIC NO. 64786. SURVEY TO SEE OF H3 AND C14 WERE PRESENT IN ENIWETOK ENVIRONMENT 12 YR POST-DETONATION WAS POSITIVE, ENIWETOK ATOLL, MARSHALL ISLANDS, HAVING BEEN PROVING GROUND FOR NUCLEAR TESTING BETWEEN 1948-1958. CRABS, CLAMS, FISH, NUTS, VEGETATION, SOIL, SEAWTAER, RAINWATER SHOWED RESIDUAL H3 AND C14. AUG 1964 RAINWATER CONTAINED 86 +-3 TRITIUM UNITS (TU) WHERE 1 TU IS 1 ATOM OF H3/10 (EXP +18) ATOMS OF HYDROGEN. LAGOON SEAWATER INCREASED FROM 60 OR LESS AT 10 FEET BELOW SURFACE TO 840 AT 1 METER FROM THE BOTTOM OF MIKE CRATER. PACIFIC OCEAN SEAWATER WAS 8. BOUND WATER IS COCONUT CRAB WAS 95 OR LESS, LOOSE WATER 81 +-30, WHILE IN HERMIT CRAB RESPECTIVE VALUES WERE 270 +-30 AND 60 OR LESS. SURGEONFISH AT RUNIT ISLAND REEF GAVE 400 +-80 AND 39 OR LESS, WHILE SURGEONFISH AT SANILDEFONSO ISLAND, MIKE CRATER, GAVE 90 +-33 AND 60 OR LESS. INNER GROWTH RINGS OF MESSERSCHMIDIA ARGENTEA GAVE 59 +-4, OUTERGROWTH RINGS 78 +-5, THE LEAVES 125 +-6, THE LITTER 204 +-7 AND THE SOIL 2920 +-65. THE SOIL OF ENIWETOK IS COMPOSED ALMOST ENTIRELY OF CORAL FRAGMENTS AND DEBRIS (CACO3 +CA(OH)2). LOOSE WATER OF THE MESSERSCHMIDIA WOOD CONTAINED 3230 TU AT CACTUS CRATER, THE SOIL BENEATH CONTAINING 509 TU, WHILE THE LEAVES CONTAINED 442 TU IN LOOSE WATER, WOIL WATER H3 BEING 509 TU. TISSUE ENRICHMENT OF BOUND C14 WAS HIGHEST IN FISH.

CARBON + FALLOUT + SURVEY, ENVIRONMENT + TESTING + *POPULATION EXPOSURE + MONITOR, NUCLEAR DETONATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + ANIMAL, FISH + BIOMASS + PHYSIOLOGY/METABOLISM + *CONCENTRATION + RADIATION EFFECT, ECOSYSTEM + COMMUNITY, PLANT + DURATION, GENERATION + OCEAN, PACIFIC + FOOD INTAKE + EXPOSURE, BACKGROUND + YEAR

064889
A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS
CONF-701106 +. 18 PAGES, PROCEEDINGS OF THE 5TH ANNUAL HEALTH PHYSICS SOCIETY MIDYEAR SYMPOSIUM, VOLUME II, PG. 266-277, (NOVEMBER 1970)

LABORATORY OPERATIONS AT BROOKHAVEN SINCE ITS ESTABLISHMENT IN 1949 HAVE INCLUDED THE ROUTINE RELEASE TO THE ENVIRONMENT OF GASEOUS, HALOGEN, AIR PARTICULATE, AND H-3 RADIOACTIVITY IN REACTOR AIR EFFLUENTS AND OF BETA-GAMMA EMITTERS AND H-3 IN LOW-LEVEL LIQUID WASTES IN AMOUNTS COMPARABLE TO CURRENT RELEASES FROM POWER REACTORS. PAST AND CURRENT SURVEILLANCE DATA AT BNL HAVE BEEN EVALUATED FOR SHORT- AND LONG-TERM CHANGES IN RADIATION LEVELS ATTRIBUTABLE TO THESE OPERATIONS. *** ON THE BASIS OF THESE DATA, IT IS CONCLUDED THAT FEW CHANGES IN BACKGROUND SHOULD BE APPARENT, EVEN AFTER LONG-TERM OPERATION OF NUCLEAR POWER REACTORS.

EFFLUENT + PARTICLE + BETA EMITTER + *REACTOR, POWER + AIR + *BNL + *RADIOACTIVITY RELEASE + GAMMA EMITTER + GAS + LIQUID + *OPERATING EXPERIENCE + *DATA COLLECTION + *COMPARISON + EXPOSURE, BACKGROUND

065087
VAUGHAN BE
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES
BATTELLE-NORTHWEST, RICHLAND, WASHINGTON
BNWL-1550 VOL. 2, PT. 2 +. 108 PAGES, MARCH 1971

62 RESEARCH TOPICS ARE REPORTED. A SMALL BUT IMPORTANT PART OF THE TOTAL EFFORT IS IN PROGRAMS CONCERNED WITH THE ARID LANDS ECOLOGY RESERVE (FOR WHICH THE LONG RANGE OBJECTIVE IS TO STUDY THE EFFECT OF ENVIRONMENTAL MODIFICATIONS BY WILDFIRE, IRRIGATION, GRAZING, HERBICIDAL APPLICATIONS, ETC.). EFFORTS ARE DESCRIBED TO PERMIT CONSERVATION-ORIENTED GROUPS TO GAIN A BETTER UNDERSTANDING OF AECS LONG INTEREST AND SUPPORT IN ECOLOGY. SEVERAL ELEMENTS OF THE SIMULATION OF THE LICHEN-CARIBOU-ESKIMO FOOD CHAIN ARE BEING REFINED. EFFORTS ARE CONTINUING IN REACTOR SITING PROBLEMS INCLUDING INJURY TO FISH BOTH FROM THERMAL EFFECTS AND FROM POTENTIAL HAZARDS ASSOCIATED WITH CHRONIC RADIOACTIVITY DISCHARGE. LONG-TERM STUDIES OF CANADA GOOSE POPULATIONS ON THE COLUMBIA RIVER ARE REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + FIRE + WASTE DISPOSAL + ZINC + RIVER, COLUMBIA + *BATTELLE NORTHWEST + ECOSYSTEM, GRASSLAND + DESTRUCTIVE WIND + SOIL PROPERTY, IN SITU + THERMAL POLLUTION + *RADIONUCLIDE UPTAKE + ECOSYSTEM, AQUATIC + FOOD CHAIN + ECOSYSTEM + RADIATION EFFECT + ECOSYSTEM, ARCTIC + ECOSYSTEM, DESERT + *RESEARCH, GOVERNMENT + PLANT, SEEDLING

065092
BOLCH WE
ENVIRONMENTAL SURVEILLANCE OF THE CRYSTAL RIVER NUCLEAR POWER PLANT
UNIVERSITY OF FLORIDA, ENVIRONMENTAL ENGINEERING, GAINESVILLE, FLORIDA
QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING JANUARY 31, 1971

THIS 2ND REPORT LISTS THE OBJECTIVES OF THE PREOPERATIONAL ASSESSMENT - (1) INFORMATION ABOUT PRESENT ENVIRONMENTAL RADIOACTIVITY, (2) PATHWAYS OF CRITICAL NUCLIDES TO THE FOOD CHAIN, (3) RADIOLOGICAL SURVEY METHODS, (4) COMPARISON OF PRESENT AND POSTOPERATIONAL RADIOACTIVITIES, AND (5) PRINCIPAL ECOSYSTEM (MARINE, MARSHLAND, AND TERRESTRIAL) NEAR THE PLANT SITE. TOPICS REPORTED - (1) AN EXTENSIVE SAMPLING PROGRAM INCLUDING MARINE, FRESHWATER, AND TERRESTRIAL ORGANISMS, (2) METHODS OF HANDLING RADIONUCLIDE EFFLUENTS, (3) THERMOLUMINESCENT DOSIMETRY, (4) AIRBORNE PARTICULATE ACTIVITY, (5) TOTAL DEPOSITION SAMPLER, (6) SURVEYING FOR ENVIRONMENTAL TRITIATED WATER, (7) EVALUATION OF SPANISH MOSS AS A BIOLOGICAL SAMPLER FOR AIRBORNE ACTIVITY, (8) GAMMA RAY SPECTROMETRY OF MARINE SEDIMENTS AND ORGANISMS.

AVAILABILITY - W. E. BLOCH, UNIVERSITY OF FLORIDA, GAINESVILLE, FLORIDA

*SITING, REACTOR + WASTE DISPOSAL + SURFACE WATER, NUCLIDE OCCURRENCE + DOSIMETRY, THERMOLUMINESCENCE + CRITICAL NUCLIDE PATHWAY + FISSION PRODUCT, AIRBORNE + SPECTROMETRY, GAMMA + ECOSYSTEM, GRASSLAND + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + FOOD CHAIN + SEDIMENT + MARINE ORGANISM + *ECOSYSTEM, MARINE

065109
BOLCH WE
AN ECOLOGICAL APPROACH TO ENVIRONMENTAL SURVEILLANCE
FLORIDA UNIVERSITY, GAINSVILLE
CONF-701106 +. 13 PAGES, PG. 252-265, 8 FIGURES, 7 REFERENCES, PROCEEDINGS OF THE FIFTH ANNUAL HEALTH PHYSICS SOCIETY MIDYEAR TOPICAL SYMPOSIUM, HEALTH PHYSICS ASPECTS OF NUCLEAR FACILITY SITING, VOL. 2, NOVEMBER 3-6, 1970

MARINE, MARSHLAND, AND TERRESTRIAL ECOSYSTEMS NEAR THE CRYSTAL RIVER NUCLEAR PLANT WILL BE WELL-STUDIED BY THE TIME THE PLANT GOES OPERATIONAL. A FINAL OBJECTIVE IS TO PROVIDE RECOMMENDATIONS TO MINIMIZE ENVIRONMENTAL DEGRADATION IN THE DESIGN AND OPERATION OF POWER PLANTS. SAMPLING IN THE MARINE ENVIRONMENT (WATER, SEDIMENT, PLANKTON, ALGAE, GRASSES, OYSTERS, SHRIMP, CRABS, PINFISH) INCLUDED THREE AREAS DESIGNATED BY THEIR NEARNESS TO THE DISCHARGE CANAL AND BE REASON OF THE DIRECTION OF FLOW OF THE GULF. THE GAMMA SCANS, FOOD WEBS, AND OTHER ENVIRONMENTAL STRESSES (OXYGEN CONTENT, SALINITY, HEALTH OF ORGANISMS) WERE STUDIED.

AVAILABILITY - BURTON R. BALDWIN, PUBLICATIONS CHAIRMAN, P. O. BOX 2431, IDAHO FALLS, IDAHO 83401

CESIUM + FALLOUT + OXYGEN + STRONTIUM + SURVEY, ENVIRONMENT + WASTE DISPOSAL, OCEAN + SAMPLING + MONITOR, ENVIRONMENTAL + SURFACE WATER, SEDIMENT + SPECTROMETRY, GAMMA + *CRYSTAL RIVER 3 (PWR) + SURVEILLANCE PROGRAM + ENVIRONMENTAL CONTROL MEASURE + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + PHYTOPLANKTON + BIOACCUMULATION/TURNOVER + FOOD CHAIN + PLANT, SPERMATOPHYTE + ECOSYSTEM + PLANT, ALGAE/FUNGI + *ECOSYSTEM, MARINE + MOLLUSC + ECOSYSTEM, ESTUARINE + SALINITY

065252
MARTER WL + PATTERSON CM
MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT
2 PAGES, AMERICAN NUCLEAR SOCIETY TRANSACTIONS, 14(1), PAGE 162-163, (JUNE 1971)

DETAILS THE VARIOUS METHODS OF MONITORING FOR TRITIUM IN ITS VARIOUS FORMS. POINTS OUT THE DIFFICULTIES OF CONTINUOUS MONITORING FOR LOW TRITIUM OXIDE CONCENTRATIONS. THE SAVANNAH RIVER PLANT IS A PRODUCER OF TRITIUM, AND CONSEQUENTLY THE MONITORING OF TRITIUM IN GASES, LIQUIDS, AND OTHER ENVIRONMENTAL MEDIA HAS BEEN OF PRIME IMPORTANCE SINCE STARTUP IN THE 1950S.

*MONITOR, LIQUID + MONITOR, STACK + *MONITOR, AIR + *MONITOR, GAS + *MONITOR, ENVIRONMENTAL + SAVANNAH RIVER PLANT + RADIATION MONITORS

066047
GUDIKSEN PH
SEMIANNUAL REPORT OF ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE LABORATORY - JANUARY THROUGH JUNE 1971
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
UCRL-51093 +. 24 PAGES, 3 REFERENCES, 17 TABLES, 8 FIGURES, AUGUST 12, 1971

AN ENVIRONMENTAL SURVEILLANCE PROGRAM WAS CONDUCTED WITHIN THE LIVERMORE VALLEY AND SITE 300 AREAS TO DETERMINE THE EFFECT OF LABORATORY OPERATIONS ON THE SURROUNDING ENVIRONMENT. ANALYSES FOR GROSS RADIOACTIVITY AND FOR SPECIFIC RADIONUCLIDES OF INTEREST IN A VARIETY OF ENVIRONMENTAL SAMPLES WERE PERFORMED. RESULTS ARE PROVIDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MEASUREMENT + PLUTONIUM + STRONTIUM + URANIUM + *WATER + SAMPLING + *AIR + ANALYTICAL TECHNIQUE + MILK + *RADIATION SAFETY AND CONTROL + *SOIL + *SURVEILLANCE PROGRAM + *ENVIRONMENTAL CONTROL MEASURE + VEGETATION + *CONCENTRATION

066272
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION,

066272 *CONTINUED*
PROGRESS REPORT JAN. 1 TO MAR. 31
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER, ONTARIO
AECL-3961 +. 49 PAGES, 1971

INCLUDES A 600-WORD TOPICAL SUMMARY ON GENETIC EFFECTS AT LOW DOSES. 200-300 WORD SUMMARIES ON PROJECTS IN THE SECTIONS, BIOLOGY (BIOCHEMISTRY AND MOLECULAR BIOLOGY, GENETICS AND POPULATIONS), AND POPULATION RESEARCH (HEREDITARY CHANGES IN VERTEBRATES, SOMATIC, AND GENETIC HARM IN HUMAN POPULATIONS). 50-150 WORD SUMMARIES IN THE SECTIONS, ENVIRONMENTAL RESEARCH (OFF-SITE AND EFFLUENT MONITORING, RADIOECOLOGY, PRODUCTIVITY STUDIES BY THE C-14 TECHNIQUE, RADIATION PROCESSING OF WASTE WATER, LOW LEVEL COUNTING) AND HEALTH PHYSICS (PLASTIC FILM-FISSION FRAGMENT NEUTRON DOSIMETRY, NAI DETECTOR EFFICIENCY, THERMOLUMINESCENCE DOSIMETRY, TRITIUM MONITORING, RADIATION INSTRUMENT DEVELOPMENTS).

*BIOMEDICAL + DOSIMETRY + EFFLUENT + STRONTIUM + WASTE TREATMENT + XENON + DOSIMETRY, THERMOLUMINESCENCE + POPULATION EXPOSURE + CHALK RIVER + MONITORING PROGRAM, ENVIRONMENTAL + PLASTICS + LAKE + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + BIOACCUMULATION/TURNOVER + ECOSYSTEM, AQUATIC + PHYSIOLOGY/METABOLISM + EFFECT, GENETIC + EFFECT, SOMATIC + *RADIATION EXPOSURE, CHRONIC + TRACE ELEMENT + MAN + RADIATION MONITORS

066917
HELD EF
ANCHITKA RADIOBIOLOGICAL PROGRAM PROGRESS REPORT, JULY 1970 TO APRIL 1971
UNIVERSITY OF WASHINGTON, LABORATORY OF RADIATION ECOLOGY, SEATTLE
NVO-269-11 +. JULY 1971

ORGANISMS, WATER, AND AIR SAMPLES WERE ANALYZED FOR RADIONUCLIDES TO DETERMINE WHETHER THERE HAD BEEN ANY RELEASE AFTER UNDERGROUND NUCLEAR TESTS. EXCEPTING TRITIUM (3600 T.U. IN PONDS AND TEST WELLS) AND SHORT-LIVED SC-46, WHICH COULD BE FROM A NUCLEAR-POWERED VESSEL, THE RADIONUCLIDES DETECTED WERE FROM WORLDWIDE FALLOUT. IN FISH, FE-55 WAS AS GREAT AS 152 PCI/G DRY WEIGHT (OR 254 PCI/MG FE SPECIFIC ACTIVITY), AND OTHER RADIONUCLIDES (EXCEPTING K-40) WERE LESS THAN 5 PCI/G DRY WEIGHT. IN LICHENS, CS-137 WAS 20 PCI/G DRY WEIGHT. IN FRESHWATER PLANTS, ZR/NB-95 WAS 12 PCI/G DRY WEIGHT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FALLOUT + *SURFACE WATER, NUCLIDE OCCURRENCE + FISSION PRODUCT, AIRBORNE + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + BIOACCUMULATION/TURNOVER + FOOD CHAIN + RADIONUCLIDE TRANSFER + *AQUATIC ORGANISM + PLANT, ALGAE/FUNGI + CONCENTRATION FACTOR + OCEAN, PACIFIC

067332
SURVEY OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER
RURAL COOPERATIVE POWER ASSOCIATION + MINNESOTA DEPARTMENT OF HEALTH
COO-651-86 +. 42 PAGES, JUNE 1971, DOCKET 115-1, TYPE--BWR, MFG--A.C., AE--SGT + LUNDY

THIS REPORT COVERS THE FISCAL YEAR 1971 AND INCLUDES DISCUSSION OF RESULTS AND SURVEY METHODS AND DATA FOR AIR, SURFACE WATER, PRECIPITATION, MILK, AND SPECIAL SECTION FOR TRITIUM IN SURFACE WATER. *** RADIATION IN ALL MEDIA PEAKED IN 1961 FROM NUCLEAR WEAPON TESTING AND HAVE DIMINISHED SINCE THEN AND REMAINED RELATIVELY STABLE SINCE 1965. CESIUM 137 AND STRONTIUM 90 PEAKED IN MILK IN 1964 THEN DECLINED AND STABILIZED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

REACTOR, BWR + CESIUM + ELK RIVER (BWR) + STRONTIUM + *SURVEY, ENVIRONMENT + MILK + RADIATION SAFETY AND CONTROL + *MONITORING PROGRAM, ENVIRONMENTAL

067941
MYERS DS + TINNEY JF + GUDIKSEN PH
HEALTH PHYSICS ASPECTS OF LRL TRITIUM RELEASE
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
UCRL-73310 +. 16 PAGES, JULY 16, 1971

ON AUGUST 6, 1970, 289,000 CI OF TRITIUM GAS WAS ACCIDENTALLY RELEASED THROUGH AN EXHAUST STACK AT THE LAWRENCE RADIATION LABORATORY, IN LIVERMORE, CALIFORNIA. SOON AFTER THE RELEASE, EMERGENCY-RESPONSE PERSONNEL SURVEYED THE SITE WITH PORTABLE TRITIUM AIR MONITORS AND AN EXTENSIVE ENVIRONMENTAL SAMPLING WAS STARTED. THE RESULTS FROM THE SAMPLING PROGRAM INDICATE THAT NO SIGNIFICANT EXPOSURE TO ON- OR OFF-SITE INDIVIDUALS RESULTED FROM THE RELEASE. ALL ENVIRONMENTAL SAMPLES OF WATER, MILK, AND URINE CONTAINED NORMAL BACKGROUND LEVELS OF TRITIUM.

AVAILABILITY - D.S. MYERS, LAWRENCE RADIATION LABORATORY, LIVERMORE, CALIFORNIA

EFFLUENT + *ACCIDENT, MONITOR + *SAMPLING + STACK + ACCIDENT, RADIOISOTOPE + *MONITOR, ENVIRONMENTAL + DOSE CALCULATION, EXTERNAL + *RADIOACTIVITY RELEASE + *CONCENTRATION

068583
ESSIG TH
RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1970
BATTELLE NORTHWEST LABORAOTYR, RICHLAND, WASHINGTON
BNWL-1613 +. 25 PAGES, SEPTEMBER 1971

068583
AN EVALUATION OF RU-RH-106 AND H-3 CONCENTRATIONS MEASURED IN THE UNCONFINED GROUNDWATER DURING THE SECOND HALF OF 1970 SHOWS THAT THE ZONES OF DETECTABLE CONTAMINATION EXTEND IN AN EASTERLY TO SOUTHEASTERLY DIRECTION FROM 200-E AREA, AS OBSERVED IN THE PAST. FOR THE FIRST TIME, H-3 CONCENTRATIONS WERE MEASURED OVER A GEOGRAPHICALLY EXTENSIVE AREA IN THE VICINITY OF THE 100 AREAS. THE FEW LOCATIONS FOR WHICH AVERAGE GROUNDWATER CONCENTRATIONS EXCEEDED THE CONCENTRATION GUIDE (CG) FOR RU-106 WERE ALL WITHIN EITHER 200-E OR 200-W AREAS. WATER FROM ONLY ONE 600 AREA WELL LOCATED OUTSIDE LIMITED AREA FENCES (WELL-699-35-70) INDICATED A H-3 CONCENTRATION GREATER THAN THE CONCENTRATION GUIDE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*MONITOR, LIQUID + RUTHENIUM + SOIL, RADIONUCLIDE MOVEMENT THROUGH + *GROUND WATER, NUCLIDE OCCURRENCE + RADIOLOGICAL ASSISTANCE + *HANFORD SITE + SAFETY EVALUATION + *SURVEILLANCE PROGRAM + MONITOR, AREA + *CONCENTRATION + TRANSPORT

069850
MAWSON CA
CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (P. 29-41)
ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES
AECL-4075 +. 13 PAGES, PP. 29-41, DECEMBER 1971

THE TOPICS REPORTED INCLUDE - MONITORING, RELEASE OF TRITIUM TO THE OTTAWA RIVER (1.5-14 CI/DAY), AND GAMMA SPECTRASCOPY OF NEUTRON-CAPTURE PRODUCTS IN RIVER WATER. CA/SR METABOLISM IN FISH WAS STUDIED BY DOUBLE TRACERS (SR-85/CA-47), AND EQUIPMENT WAS INSTALLED FOR SIMULATING PESTICIDE CONTAMINATION. SEDIMENT CORES WERE ANALYZED FOR TOTAL AND EXCHANGEABLE FRACTIONS OF STABLE AND RADIOSTRONTIUM. ANALYTICAL TECHNIQUE DEVELOPMENT INCLUDED CONCENTRATION OF WATER FOR TRACE-ELEMENT ANALYSIS, NEUTRON ACTIVATION ANALYSIS, LOW-BACKGROUND BETA COUNTING. TRITIUM AND DEUTERIUM TRACERS WERE USED IN STUDIES OF THE WATER BALANCE OF LAKES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVATION + CALCIUM + CERIUM + COBALT + DEUTERIUM + RIVER + STRONTIUM + *SURVEY, ENVIRONMENT + TRACER, RADIOACTIVE + MANGANESE + RIVER, OTTAWA + SURFACE WATER, NUCLIDE OCCURRENCE + ANALYTICAL TECHNIQUE + CHALK RIVER + NEUTRON + SCANDIUM + LAKE + AECL + *RADIONUCLIDE UPTAKE + ANIMAL, FISH + BIOACCUMULATION/TURNOVER + *ECOSYSTEM, AQUATIC + PHYSIOLOGY/METABOLISM + PESTICIDE

070063
SPENCER DW + BREWER PG
ANALYTICAL METHODS IN OCEANOGRAPHY - I. INORGANIC METHODS
WOODS HOLE OCEANOGRAPHIC INSTITUTION, MASS.
69 PAGES, FIGURES, TABLES, REFERENCES, CRC CRIT. REV. SOLID STATE SCI., 1: 409-78 (SEPTEMBER 1970)

THE ANALYTICAL CHEMISTRY INVOLVED IN THE DETERMINATION OF THE MAJOR IONS, TRACE ELEMENTS, NUTRIENTS, DISSOLVED GASES, AND RADIONUCLIDES PRESENT IN SEAWATER IS DISCUSSED. PARTICULAR ATTENTION IS PAID TO RECENT DEVELOPMENTS AND TO THE TECHNIQUES THAT ARE ACTIVELY IN USE IN OCEANOGRAPHIC LABORATORIES. SEAWATER SAMPLING AND STORAGE METHODS ARE REVIEWED, AND TABLES OF THE TRACE ELEMENTS AND RADIONUCLIDES THAT HAVE BEEN DETERMINED IN THE OCEAN ARE GIVEN.

CARBON + CESIUM + ELEMENTS AND ISOTOPES + MEASUREMENT + *OCEAN AND SEA + STRONTIUM + THORIUM + URANIUM + *SURFACE WATER, NUCLIDE OCCURRENCE + *ANALYTICAL TECHNIQUE + *RADIOCHEMICAL ANALYSIS + *CONCENTRATION + *INORGANIC

070252
BOGEN DC + WELFORD GA
APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL BETA AND ALPHA ASSAY
U. S. ATOMIC ENERGY COMMISSION, NEW YORK, N.Y.
STI/PUB-280 + CONF-710705 + IAEA-SM-148-3 +. 7 PAGES, 3 TABLES, 2 FIGURES, 5 REFERENCES, PP. 383-389, DECEMBER 12, 1971, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM HELD AT NEUHERBERG, GERMANY, JULY 5-9, 1971

TOTAL BETA AND ALPHA MEASUREMENTS HAVE BEEN PERFORMED, SIMULTANEOUSLY, BY LIQUID SCINTILLATION SPECTROMETRY. THE BETA MEASUREMENT CLASSIFIES THE ISOTOPES BY ENERGY DISCRIMINATION INTO TWO CATEGORIES - LOW ENERGY (H-3, ETC.) AND FISSION PRODUCTS OR ACTIVATION PRODUCTS OF MEDIUM-TO-HIGH ENERGY. THE ALPHA MEASUREMENT IS PERFORMED BY RATIO TECHNIQUES SINCE THE ALPHA SPECTRUM IS LOCATED IN THE MEDIUM TO HIGH ENERGY BETA SPECTRAL REGION. THEREFORE, ONE MEASUREMENT PROVIDES THE FOLLOWING INFORMATION FOR AN ENVIRONMENTAL SAMPLE - (1) RELATIVE CONTRIBUTION OF TRITIUM AND OTHER LOW ENERGY EMITTERS TO THE TOTAL BETA SPECTRUM; (2) CONTRIBUTION OF FISSION AND ACTIVATION PRODUCTS TO THE TOTAL BETA SPECTRUM; AND (3) TOTAL ALPHA ENERGY BETA AND 0.1 DPM/ML FOR ALPHA. A DESCRIPTION OF OUR EXPERIMENTAL RESULTS, DATA PROCESSING, APPLICATION TO ENVIRONMENTAL MONITORING AND COMPARISON OF THIS TECHNIQUE TO EXISTING METHODS IS GIVEN.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N.Y. 10016

IAEA + *MONITOR, EMERGENCY + DATA PROCESSING + *ANALYTICAL TECHNIQUE + MONITOR, ENVIRONMENTAL + *SPECTROMETRY, ALPHA + *SPECTROMETRY, BETA + ENERGY LEVEL + COMPARISON + RADIATION MONITORS

070255 *CONTINUED*
KORANDA JJ + PHELPS PL + ANSPAUGH LR + HOLLADAY G
SAMPLING AND ANALYTICAL SYSTEMS FOR MEASURING ENVIRONMENTAL RADIOACTIVITY
LAWRENCE RADIATION LABORATORY, UNIVERSITY OF CALIFORNIA, LIVERMORE, CALIFORNIA
STI/PUB-280 + CONF-710705 + IAEA-SM-148-36 +. 28 PAGES, 19 FIGURES, 2 TABLES, 16 REFERENCES, PP. 587-614, DECEMBER 12, 1971, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM HELD AT NEUHERBERG, GERMANY, JULY 5-9, 1971

RAPID METHODS OF SAMPLING AND QUANTITATING AIRBORNE TRITIATED WATER, RADIOACTIVE PARTICULATES AND A WIDE RANGE OF ENVIRONMENTAL SAMPLES HAVE BEEN DEVELOPED TO DOCUMENT THE RELEASES OF RADIOACTIVITY ASSOCIATED WITH USES OF NUCLEAR EXPLOSIVES, REACTOR OPERATION AND BASIC RADIOECOLOGICAL STUDIES. TWO TYPES OF ATMOSPHERIC WATER SAMPLERS HAVE BEEN USED IN ENVIRONMENTAL STUDIES CONDUCTED IN REMOTE FIELD OPERATIONS. A SIMPLE COLD-PIPE SAMPLER OF SEVERAL DESIGNS EMPLOYING EITHER LN OR CO2 HAS BEEN USED IN LABORATORY STUDIES AND FIELD STUDIES. A MORE COMPLEX SAMPLER WHICH MAY EVENTUALLY BE ACTUATED USING A COLUMN OF MAGNESIUM PERCHLORATE OR MOLECULAR SIEVE HAS ALSO BEEN USED. A SAMPLING AND ANALYTICAL SYSTEM FOR DETERMINING AIR CONCENTRATIONS OF RADIOACTIVE PARTICULATES HAS BEEN USED SUCCESSFULLY IN SEVERAL TYPES OF RADIOECOLOGICAL STUDIES ASSOCIATED WITH NUCLEAR CRATERING EXPERIMENTS, MONITORING OF WORLDWIDE AND CLOSE-IN FALL-OUT DEPOSITION, AND REACTOR STUDIES. DETAILS ARE GIVEN FOR THE SAMPLING PROGRAM AND THE ANALYTICAL PROCEDURES.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, INC., 317 EAST 34TH STREET, NEW YORK, N. Y. 10016

DEPOSITION + FALLOUT + IAEA + MEASUREMENT + *MONITOR, EMERGENCY + *ATMOSPHERIC POLLUTION + *SAMPLING + *ANALYTICAL TECHNIQUE + MONITOR, ENVIRONMENTAL + NUCLEAR DETONATION + PARTICLE, RADIOACTIVE + *SPECTROMETRY, GAMMA + CONCENTRATION

070416
CLAASSEN HC
RADIOCHEMICAL ANALYSIS OF WATER FROM SELECTED STREAMS AND PRECIPITATION COLLECTED IMMEDIATELY BEFORE AND AFTER THE SECOND PRODUCTION-TEST FLARING, PROJECT RULISON
GEOLOGICAL SURVEY, DENVER, COLORADO
USGS-474-122 +. PNE-R-56 +. 10 PAGES, 1971

THE U.S. GEOLOGICAL SURVEY ESTABLISHED A WATER-SAMPLING NETWORK IN CENTRAL AND WESTERN COLORADO TO SAMPLE THE HYDROLOGIC ENVIRONMENT BEFORE, DURING, AND AFTER THE VARIOUS PHASES OF PROJECT RULISON. PROJECT RULISON IS AN EXPERIMENT DESIGNED TO STIMULATE PRODUCTION OF NATURAL GAS BY EXPLOSION OF A NUCLEAR DEVICE IN THE GAS-RESERVOIR ROCK. THE PROJECT IS SPONSORED BY THE AUSTRAL OIL COMPANY, USAEC, AND THE U.S. DEPT. OF THE INTERIOR. THIS IS ONE OF A SERIES OF REPORTS THAT PRESENT THE DATA OBTAINED BY ANALYSIS OF SAMPLES COLLECTED FROM THE NETWORK STATIONS. ALL THE PRECIPITATION SAMPLES ARE ROUTINELY ANALYZED FOR TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAMPLING + NUCLEAR DETONATION + *RADIOCHEMICAL ANALYSIS + *RADIOACTIVITY RELEASE + *GAS + *STIMULATION

070616
RADIATION DATA
48 PAGES, FIGURES, TABLES, REFERENCES, RADIATION DATA AND REPORTS, 13(4), PP. 195-242 (APRIL 1972)

REPORTS DATA PROVIDED BY FEDERAL, STATE, AND FOREIGN GOVERNMENTAL AGENCIES AND OTHER COOPERATING ORGANIZATIONS. DATA REPORTED IS ACCUMULATED FROM SURVEILLANCE PROGRAMS CONCERNING RADIONUCLIDE CONCENTRATIONS OF MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA AS STRONTIUM IN HUMAN BONE AND ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT U.S. ATOMIC ENERGY COMMISSION INSTALLATIONS.

PLUTONIUM + REGULATION + STRONTIUM + *SAMPLING + ANALYTICAL TECHNIQUE + *MONITOR, ENVIRONMENTAL + NEVADA TEST SITE + PADUCAH PLANT + *RADIATION SAFETY AND CONTROL + *SURVEILLANCE PROGRAM + *DATA COLLECTION + CONCENTRATION

072141
CARFAGNO DG + WESTENDORF WH
ENVIRONMENTAL MONITORING REPORT - JULY-DECEMBER 1971 AND 1971 SUMMARY
MOUND LABORATORY, MONSANTO RESEARCH CORPORATION, MIAMISBURG, OHIO
MLM-1922-+. 42 PAGES, 2 FIGURES, 16 TABLES, 6 REFERENCES, MAY 1972

THE ENVIRONMENT SURROUNDING MOUND LABORATORY WAS MONITORED AND REPORTED ON FOR THE SECOND HALF OF 1971 AND FOR THE ENTIRE YEAR. SAMPLES ANALYZED AND REPORTED ON INCLUDE AIR, WATER, FOODSTUFFS, SOIL, AND SILT. FOR RADIOACTIVE SPECIES THE AVERAGE CONCENTRATIONS OF POLONIUM-210, PLUTONIUM-238, AND TRITIUM DETECTED WERE WELL WITHIN THE STRINGENT STANDARDS ADOPTED BY THE AEC AND THE ENVIRONMENTAL PROTECTION AGENCY. DATA CONCERNING NONRADIOACTIVE SPECIES IN AIR AND WATER ARE PRESENTED FOR THE FIRST TIME. DATA FOR THESE INDICATE THAT LABORATORY OPERATIONS HAVE NEGLIGIBLE EFFECT ON THE ENVIRONMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CODES AND STANDARDS + PLUTONIUM + *WATER + MONITOR, SAMPLING + POLONIUM + *AIR + *MONITOR, ENVIRONMENTAL + *MOUND LABORATORY + MONITOR, GROUND SURFACE + RADIATION SAFETY AND CONTROL + *SOIL + MONITOR, TELEMETRY + MONITOR, AREA + *CONCENTRATION + *FOOD

072249
RADIATION DATA
67 PAGES, RADIATION DATA AND REPORTS, 13(5), PP. 255-321 (MAY 1972)

REPORTS DATA PROVIDED BY FEDERAL, STATE, AND FOREIGN GOVERNMENTAL AGENCIES AND OTHER COOPERATING ORGANIZATIONS. DATA REPORTED IS ACCUMULATED FROM SURVEILLANCE PROGRAMS CONCERNING RADIONUCLIDE CONCENTRATIONS OF MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA AS STRONTIUM IN HUMAN BONE AND ENVIRONMENTAL LEVELS OF RADIOACTIVE AT USAEC INSTALLATIONS.

DEPOSITION + FALLOUT + IODINE + SAMPLING + *SURFACE WATER, NUCLIDE OCCURRENCE + *AIR + ANALYTICAL TECHNIQUE + ANL + *MILK + BNL + DIETARY HABIT + WATER, DRINKING + GROSS BETA + NEVADA TEST SITE + NUCLEAR DETONATION + *SURVEILLANCE PROGRAM + OFF SITE + *DATA COLLECTION + VEGETATION + *CONCENTRATION + AGENCY, AEC + *FOOD + ENVIRONMENTAL PROTECTION AGENCY (EPA)

072581
CASTAGNOLA DC
TRITIUM ANOMALIES ON AMCHITKA ISLAND, ALASKA. PART II
TELEDYNE ISOTOPES, LAS VEGAS, NEVADA
NVO-1229-113(PT.2) +. 23 PAGES, 4 FIGURES, 3 TABLES, SEPTEMBER 1969

FOLLOWING THE LONG SHOT EVENT ON AMCHITKA ISLAND, ALASKA, SENSITIVE RADIOLOGICAL SURVEILLANCE EFFORTS DETECTED ANOMALOUS CONCENTRATIONS OF TRITIUM, RADIOIODINE, AND RADIOKRYPTON IN SURFACE WATER AND SOIL-GAS SAMPLES COLLECTED IN THE VICINITY OF GROUND ZERO. ANOMALOUS TRITIUM LEVELS RANGED FROM SEVERAL HUNDRED TO SEVERAL THOUSAND TRITIUM UNITS ABOVE NATURAL BACKGROUND. ANOMALOUS RADIOKRYPTON LEVELS RANGED FROM SEVERAL HUNDRED TO SEVERAL THOUSAND TIMES NATURAL BACKGROUND. THE ONLY REASONABLE SOURCE OF ANOMALIES WAS THE NUCLEAR EXPLOSION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CONTAINMENT, UNDERGROUND + *IODINE + *KRYPTON + *PLOWSHARE + *TESTING + *SURFACE WATER, NUCLIDE OCCURRENCE + NUCLEAR DETONATION + SOIL, NUCLIDE OCCURRENCE + SURVEILLANCE PROGRAM + *CONCENTRATION

073004
OESTLUND HG
STUDY OF TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT
MIAMI UNIVERSITY, ROSENSTIEL SCHOOL OF MARINE AND ATMOSPHERIC SCIENCES, FLORIDA
UM-RSMAS-72031 +. 14 PAGES, APRIL 15, 1972

IN ADDITION TO THE EXISTING GROUND-LEVEL STATIONS FOR ATMOSPHERIC HT AND HTO IN MIAMI AND FAIRBANKS, A THIRD STATION WAS ESTABLISHED AT THE MAUNA LOA OBSERVATORY, ISLAND OF HAWAII. ROUTINE SAMPLING AND ANALYSIS OF THE SAMPLES FROM ALL THREE GROUND STATIONS ON A TWICE-WEEKLY BASIS HAVE BEEN CONTINUED. DATA UP TO THE END OF 1971 ARE AVAILABLE. A LONGITUDINAL PROFILE FROM THE U.S. TO 65 DEG S OF HT AND HTO WAS COLLECTED. A SECOND BIG GREEN BOX, AIRCRAFT SAMPLER, WAS BUILT AND SIX VERTICAL PROFILES ON THE NCAR SABRELINER WERE SAMPLED. A SAMPLING SYSTEM FOR THE RB-57F AIRCRAFT IS PRESENTLY UNDER CONSTRUCTION.

*MONITOR, AIR + SAMPLING + AIRCRAFT + ANALYTICAL TECHNIQUE + *MONITOR, ENVIRONMENTAL + MONITOR, GROUND SURFACE + MONITORING SYSTEM, RADIATION + RADIATION PROFILE

073660
GUDIKSEN PH + LINDEKEN CL + GATROUSIS C + ANSPAUGH LR
ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE LABORATORY, JANUARY THROUGH DECEMBER, 1971
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
UCRL-51242 +. 47 PAGES, JUNE 14, 1972

AN ENVIRONMENTAL SURVEILLANCE PROGRAM IS CONTINUING IN THE LIVERMORE VALLEY AND SITE 300 AREAS TO DETERMINE TO WHAT EXTENT, IF ANY, THE LAWRENCE LIVERMORE LABORATORY HAS CONTRIBUTED TO THE LEVELS OF RADIOACTIVITY IN THE SURROUNDING ENVIRONMENT. THE RESULTS OF ANALYSES FOR GROSS RADIOACTIVITY AND FOR SPECIFIC RADIONUCLIDES OF INTEREST IN A VARIETY OF ENVIRONMENTAL SAMPLES ARE PRESENTED IN THE REPORT. ENVIRONMENTAL LEVELS OF RADIOACTIVITY WERE BELOW THE CONCENTRATION GUIDE LEVELS IN AEC MANUAL CHAPTER 0524.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSE + INHALATION + PLUTONIUM + URANIUM + *WATER + *AIR + MILK + *MONITOR, ENVIRONMENTAL + *SOIL + *CONCENTRATION + FILTERS

073928
CASTAGNOLA DC
TRITIUM ANOMALIES ON AMCHITKA ISLAND, ALASKA. PART I
TELEDYNE ISOTOPES, PALO ALTO, CALIFORNIA
NVO-1229-113(PT. 1) +. 41 PAGES, JULY 1969

THE LONG SHOT EVENT OCCURRED AT AMCHITKA ISLAND, ALASKA, ON OCTOBER 29, 1965. THE EVENT INVOLVED THE DETONATION OF AN 80-KT NUCLEAR DEVICE 2300 FEET UNDERGROUND. TRITIUM RESULTING FROM THE LONG SHOT EXPLOSION WAS DETECTED IN SEVERAL SOURCES OF WATER IN THE VICINITY OF LONG SHOT SURFACE GROUND ZERO SEVERAL MONTHS TO YEARS AFTER THE DETONATION. THE H-3 CONTENT IN THESE SOURCES

073928 *CONTINUED*
REACHED LEVELS SEVERAL THOUSAND TRITIUM UNITS ABOVE THE H-3 CONTENT IN WATER SAMPLED FAR FROM THE TEST SITE. HOWEVER, THE LEVELS OF H-3 CONTAMINATION IN SURFACE WATER WERE WELL BELOW THE CONCENTRATION GUIDE OF 0.001 MICROCURIE PER MILLILITER OF WATER SET BY THE USAEC AS A STANDARD FOR RADIATION PROTECTION FOR CONTINUOUS EXPOSURE IN AN UNCONTROLLED AREA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GUIDE + TESTING + *WATER + SAMPLING + *NUCLEAR DETONATION + *REGULATION, AEC + RADIATION SAFETY AND CONTROL + *CONCENTRATION + AGENCY, AEC

074003
ESSINGTON EH + CASTAGNOLA EJ
INTERIM SUMMARY OF TRITIUM DATA FOR STS 'A,' AMCHITKA ISLAND, ALASKA JULY 1, 1969 THRU JUNE 30, 1970
TELEDYNE ISOTOPES, PALO ALTO, CALIFORNIA
NVO-1229-157 +. 99 PAGES, JUNE 30, 1970

SEVERAL SITES ON AMCHITKA ISLAND, ALASKA, WERE USED BY THE USAEC FOR UNDERGROUND NUCLEAR TESTING OR ARE UNDER CONSIDERATION FOR SUCH USE. THE RESULTS ARE PRESENTED OF TRITIUM DETERMINATIONS AND OTHER HYDROLOGIC INFORMATION OBTAINED FROM ANALYSES MADE DURING THE PERIOD JULY 1, 1969, TO JUNE 30, 1970, ON ENVIRONMENTAL WATER SAMPLES COLLECTED IN THE VICINITY OF THESE SITES. SINCE INITIAL SAMPLING IN 1966, GENERAL SAMPLING PROGRAMS HAVE BEEN EXPANDED TO INCLUDE THE IMMEDIATE VICINITIES OF LONG SHOT AND MILROW SITES WHERE UNDERGROUND NUCLEAR TESTS OCCURRED ON OCTOBER 29, 1965, AND OCTOBER 2, 1969, RESPECTIVELY. AN EXTENSIVE SAMPLING AND ANALYTIC PROGRAM WAS BEGUN SHORTLY AFTER THE MILROW EVENT TO PROVIDE INFORMATION FOR EVALUATING ITS RADIOLOGICAL EFFECTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLOWSHARE + *TESTING + *SAMPLING + ANALYTICAL TECHNIQUE + *NUCLEAR DETONATION + *HYDROLOGY + *MONITOR, NUCLEAR DETONATION + ALASKA + CONCENTRATION + RADIATION EFFECT

074298
MOGHISSI AA + CARTER MW + LIEBERMAN R
RADIOBIOASSAY PROGRAM OF THE INSTITUTIONAL TOTAL DIET SAMPLING NETWORK: I ANALYTICAL DATA RELATED TO SAMPLES COLLECTED DURING 1966-1968
ENVIRONMENTAL PROTECTION AGENCY + GEORGIA INSTITUTE OF TECHNOLOGY + EASTERN ENVIRONMENTAL RESEARCH FACILITY, ALABAMA
16 PAGE, 10 TABLES, 1 FIGURE, 9 REFERENCES, RADIATION DATA AND REPORTS, 14(3), PP. 129-144 (MARCH 1973)

IN JANUARY 1966, A RADIOBIOASSAY PROGRAM WAS ADDED TO THE INSTITUTIONAL TOTAL DIET SAMPLING NETWORK PROGRAM. THE SAMPLING AND ANALYSIS PROCEDURES ARE DESCRIBED AND THE DATA FOR 1966 THROUGH 1968 ARE PRESENTED.

CESIUM + STRONTIUM + DATA PROCESSING + SAMPLING + ANALYTICAL TECHNIQUE + CRITICAL NUCLIDE + *DIETARY HABIT + *SURVEY, RADIATION + CRITICAL NUCLIDE PATHWAY + DATA COLLECTION + *CONCENTRATION + EFFECT, AGE + EXCRETION, URINE + *BODY BURDEN + EFFECT, SEX + *FOOD

074335
GUDIKSEN PH + MEADOWS JW + HAMBY KO
ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE LABORATORY - 1972 ANNUAL REPORT
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
UCRL-51333 +. 45 PAGES, 26 TABLES, 11 FIGURES, 8 REFERENCES, MARCH 7, 1973

THE LAWRENCE LIVERMORE LABORATORY CONTINOUSLY MONITORS THE LEVELS OF RADIOACTIVITY WITHIN THE LIVERMORE VALLEY AND SITE 300. RESULTS OF ANALYSES PERFORMED DURING 1972 FOR GROSS RADIOACTIVITY AND FOR SPECIFIC RADIOISOTOPES OF INTEREST IN A VARIETY OF ENVIRONMENTAL SAMPLES ARE PRESENTED IN THIS REPORT. IN ALL CASES, THE LEVELS OF RADIOACTIVITY WERE BELOW THE CONCENTRATION-GUIDE VALUES IN AEC MANUAL CHAPTER 0524.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT + GUIDE + FALLOUT + MEASUREMENT + PLUTONIUM + REGULATION + ATMOSPHERIC POLLUTION + URANIUM + *WATER + *SAMPLING + ANALYTICAL TECHNIQUE + *MILK + DOSIMETRY, THERMOLUMINESCENCE + *MONITOR, ENVIRONMENTAL + CONTAMINATION + *FISSION PRODUCT, AIRBORNE + *SOIL + SPECTROMETRY, GAMMA + *VEGETATION + CONCENTRATION

074531
CARFAGNO DG + WESTENDORF WH
ANNUAL ENVIRONMENTAL MONITORING REPORT: CALENDAR YEAR 1972
MOUND LABORATORY, MIAMISBURG, OHIO
MLM-2028+. 32 PAGES, 18 TABLES, 3 FIGURES, 5 REFERENCES, MARCH 15, 1973

THE ENVIRONMENT SURROUNDING MOUND LABORATORY WAS MONITORED AND REPORTED ON FOR CALENDAR YEAR 1972. SAMPLES ANALYZED AND REPORTED ON INCLUDED AIR, WATER, FOODSTUFFS, SOIL AND SILT. FOR RADIOACTIVE SPECIES, THE AVERAGE CONCENTRATIONS OF POLONIUM-210, PLUTONIUM-238 AND TRITIUM DETECTED WERE WELL WITHIN THE STRINGENT STANDARDS ADOPTED BY THE ATOMIC ENERGY COMMISSION AND THE ENVIRONMENTAL PROTECTION AGENCY. DATA CONCERNING NONRADIOACTIVE SPECIES IN AIR AND WATER ARE ALSO PRESENTED. DATA FOR THESE INDICATE THAT MOUND LABORATORY OPERATIONS HAVE NEGLIGIBLE EFFECT ON THE ENVIRONMENT.

074531 *CONTINUED*
MEASUREMENT + MONITOR, GENERAL PRACTICE + PLUTONIUM + *WATER + *AIR + *MONITOR, ENVIRONMENTAL + *MOUND LABORATORY + REGULATION, AEC + *SOIL + CONCENTRATION + *FOOD

074589
KIPP KL
RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DEC., 1971
BATTELLE PACIFIC NORTHWEST LABORATORIES
BNWL-1680 +. 32 PAGES, FIGURES, JANUARY 1973

GROUNDWATER CONCENTRATION DATA FOR THREE SOURCE ZONES ARE PRESENTED. ALL GROUNDWATER SAMPLES REPORTED WERE TAKEN BY THE RADIATION MONITORING SECTION AND WERE ANALYZED BY THE TECHNICAL ANALYSIS SECTION OF BATTELLE-NORTHWEST AS PART OF THE HANDFORD ENVIRONMENTAL SURVEILLANCE PROGRAM CONDUCTED BY THE ENVIRONMENTAL EVALUATIONS SECTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

RUTHENIUM + *GROUND WATER, NUCLIDE OCCURRENCE + RHODIUM + *HANFORD SITE + *MONITOR, AREA + CONCENTRATION

074859
SCHRODER LJ + BALLANCE WC
RADIOCHEMICAL MONITORING OF WATER AFTER THE CANNIKEN EVENT, AMCHITKA ISLAND, ALASKA, JULY 1972
GEOLOGICAL SURVEY, COLORADO
USGS-474-166 +. 19 PAGES, MARCH 1973

THE U.S. GEOLOGICAL SURVEY COLLECTED WATER SAMPLES FROM AMCHITKA ISLAND, ALASKA, DURING JULY 1972. TRITIUM DETERMINATIONS WERE MADE ON ALL SAMPLES COLLECTED AND GROSS ALPHA AND GROSS BETA/GAMMA DETERMINATIONS WERE MADE ON 41 SAMPLES. THE GROSS ALPHA AND GROSS BETA DETERMINATIONS WHEN COMPARED WITH PREVIOUSLY DETERMINED RANGES FOR FRESH WATERS ON AMCHITKA ISLAND SHOW NO TRENDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLOWSHARE + TESTING + *WATER + *SAMPLING + GROSS ALPHA + GROSS BETA + GROSS GAMMA + NUCLEAR DETONATION + *RADIOCHEMICAL ANALYSIS + RADIOACTIVITY RELEASE + ALASKA

074865
HERCOG JE
ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY
LOS ALAMOS SCIENTIFIC LABORATORY
LA-5184 +. 54 PAGES, 31 PAGES, 22 FIGURES, 25 REFERENCES, MARCH 1973

THE ENVIRONMENTAL MONITORING PROGRAM IN EFFECT FOR CALENDAR YEAR 1972 IS DESCRIBED. RESULTS ARE GIVEN OF ROUTINE MONITORING OF RADIATION LEVELS AND LEVELS OF RADIOACTIVE AND NONRADIOACTIVE CONTAMINANTS IN THE LABORATORY ENVIRONS, INCLUDING THE ATMOSPHERE, THE LOS ALAMOS WATER SUPPLY, LOCAL SURFACE AND GROUND WATER, SEDIMENTS, AND SOILS. CONCENTRATIONS AND LEVELS ARE COMPARED WITH APPLICABLE GUIDE VALUES AND WITH RESULTS OBTAINED AT OTHER LOCATIONS AND LOCALLY DURING OTHER REPORTING PERIODS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DOSIMETRY + *EFFLUENT + KRYPTON + MEASUREMENT + PLUTONIUM + STRONTIUM + WASTE DISPOSAL + SITE CLIMATOLOGY + *MONITOR, ENVIRONMENTAL + GROSS ALPHA + GROSS BETA + *LASL + SOIL + METEOROLOGY + *MONITOR, AREA + *GAS + *LIQUID + *SOLID + SEDIMENT

074869
RADIATION DATA
35 PAGES, FIGURES, TABLES, RADIATION DATA AND REPORTS, 14(4), PP. 237-272 (APRIL 1973)

REPORTS DATA PROVIDED BY FEDERAL, STATE, FOREIGN GOVERNMENTAL AGENCIES, AND OTHER COOPERATING ORGANIZATIONS. DATA REPORTED IS ACCUMULATED FROM SURVEILLANCE PROGRAMS CONCERNING RADIONUCLIDE CONCENTRATIONS OF MILK, FOOD, WATER, AND AIR AND DEPOSITION. ALSO GIVEN ARE ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT SOME ATOMIC ENERGY COMMISSION INSTALLATIONS. SOME OF THE MORE IMPORTANT RADIOISOTOPES OF CONCERN ARE STRONTIUM, CESIUM, IODINE, BARIUM, COBALT, XENON, KRYPTON, AND PLUTONIUM.

BARIUM + CARBON + CESIUM + DEPOSITION + FALLOUT + IODINE + STRONTIUM + WATER + *SAMPLING + AIR + ANALYTICAL TECHNIQUE + MILK + ROCKY FLATS + *SURVEILLANCE PROGRAM + *DATA COLLECTION + CONCENTRATION + *RADIATION EXPOSURE + FOOD + ENVIRONMENTAL PROTECTION AGENCY (EPA)

075312
KOENIG LA + WINTER M
TRITIUM CONTAMINATION OF THE ENVIRONMENT
GESELLSCHAFT FUER KERNFORSCHUNG MBH, KARLSRUHE, ABTEILUNG STRAHLENSCHUTZ UND SICHERHEIT
14 PAGES, 4 TABLES, 16 REFERENCES, PRESENTED AT THE COMMISSION OF THE EUROPEAN COMMUNITIES INTERNATIONAL SYMPOSIUM ON RADIOECOLOGY APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT, ROME, SEPTEMBER 1971

MEASUREMENT WITHOUT PRIOR CONCENTRATION IS RECOMMENDED AND DESCRIBED (THE INSTA-GEL COCKTAIL,

075312 *CONTINUED*
INTERNAL SCINTILLANT). SINCE TRITIUM IN AIR IS LARGELY IN THE FORM OF TRITIATED WATER, IN THIS CASE SAMPLING BY COLLECTION ON A COLD FINGER IS RECOMMENDED. THE AUTHORS' RESULTS FOR SURFACE-, GROUND-, AND RAINWATER ARE COMPARED WITH THOSE OF OTHERS. CONCENTRATIONS RANGED FROM 0.4-1.4 PCI/ML, AND THE AVERAGE DOSE TO MAN WAS ABOUT 0.1 MREM/YEAR. ALTHOUGH THE AIR MOISTURE IN CERTAIN KARLSRUHE LABORATORIES REACHED GREATER THAN 3 PCI/ML, THE MAXIMUM DOSE FROM THIS SOURCE WAS ABOUT 0.01 MREM/YEAR. (MOST OF THE DOSE IS FROM WORLD WIDE CONTAMINATION FROM NUCLEAR TESTING.)

AVAILABILITY - OFFICE FOR OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES, P.O.B. 1003, LUXEMBOURG 1

CONTAINMENT INSTRUMENTATION + MONITOR, LIQUID + *HUMIDITY, RELATIVE + MONITOR, SAMPLING + SAMPLING + SURFACE WATER, NUCLIDE OCCURRENCE + ANALYTICAL TECHNIQUE + DOSE CALCULATION, INTERNAL + GROUND WATER, NUCLIDE OCCURRENCE + NUCLEAR DETONATION + SURVEY, RADIATION + CRITICAL NUCLIDE PATHWAY + *ENVIRONMENT + KARLSRUHE + CONTAINMENT LEAK MONITOR + *RADIONUCLIDE UPTAKE + RADIONUCLIDE TRANSFER + EXPOSURE, BACKGROUND

075362
KIRCHMANN R + CANTILLON G
BEHAVIOR IN RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR POWER PLANTS
MOL, DEPARTMENT OF RADIOBIOLOGY + INSTITUTE OF HEALTH, BRUSSELS
17 PAGES, 8 TABLES, 2 REFERENCES, PRESENTED AT THE COMMISSION OF THE COMMUNITIES INTERNATIONAL SYMPOSIUM ON RADIOECOLOGY, APPLIED TO THE PROTECTION OF MAN AND HIS ENVIRONMENT, ROME, SEPTEMBER 1971

DURING PERIODS OF EFFLUENT RELEASE FROM THE ARDENNES NUCLEAR POWERPLANT, DOWNSTREAM EFFECTS WERE STUDIED. TRITIATED-WATER CONCENTRATION IN RIVER WATER REACHED ABOUT 1500 PICOCURIES/LITER; CO AND MN RADIONUCLIDES, ABOUT 10 PICOCURIES/LITER. FIELD AND LABORATORY STUDIES GAVE FIXATION OF MN AND CO BY SEDIMENTS OF FROM 0.7 TO 2%. CO AND MN CONCENTRATION FACTORS FOR SEDIMENT (IN SUSPENSION) WERE AS HIGH AS ABOUT 30,000; FOR A SPECIES OF AQUATIC MOSS, ABOUT 600.

AVAILABILITY - OFFICE FOR OFFICIAL PUBLICATIONS OF THE EUROPEAN COMMUNITIES, P.O.B. 1003, LUXEMBOURG 1

COBALT + MANGANESE + *WASTE DISPOSAL, RIVER + ANALYTICAL TECHNIQUE + CRITICAL NUCLIDE PATHWAY + *RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + RADIONUCLIDE TRANSFER + AQUATIC ORGANISM + *SEDIMENT + LABORATORY EXPERIMENT + FIELD EXPERIMENT + CONCENTRATION FACTOR + PLANT, MOSS/FERN

075733
NORK WE + FORSLOW EJ + ESSINGTON EH
RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA
TELEDYNE ISOTOPES, INC.
NVO-1229-175 +. 84 PAGES, 8 TABLES, 3 FIGURES, 1 REFERENCE, SEPTEMBER 1971

A 1969-1970 SURVEILLANCE PROGRAM OF TRANSPORT OF RADIOACTIVITY THROUGH GROUND WATER FROM THE SITES OF UNDERGROUND NUCLEAR DETONATIONS IS DESCRIBED, AND IT IS RECOMMENDED THAT ONCE-A-YEAR SAMPLING CONTINUE. IN A RELATED STUDY, DISTRIBUTION COEFFICIENTS (GRAMS RADIONUCLIDE IN ONE GRAM OF MINERAL CORE/GRAMS RADIONUCLIDE IN ONE ML OF ASSOCIATED GROUND WATER) WERE DETERMINED BY ADDING RADIONUCLIDES TO ENVIRONMENTAL SAMPLES. DISTRIBUTION COEFFICIENTS RANGED FROM 30 TO 2800 FOR CA-45; 25 TO 2500 FOR SR-85; AND 70 TO 5000 FOR CS-137.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SOIL, RADIONUCLIDE MOVEMENT THROUGH + *GROUND WATER, NUCLIDE OCCURRENCE + GROUND WATER, PROPERTY + GROUND WATER, TRACER + *NEVADA TEST SITE + MONITOR, BACKGROUND + CRITICAL NUCLIDE PATHWAY + ION EXCHANGE + RADIOCHEMICAL ANALYSIS + SORPTION + HYDROLOGY, RATE OF MOVEMENT + SOIL PROPERTY, IN SITU + SURVEILLANCE PROGRAM + RADIONUCLIDE UPTAKE + *RADIONUCLIDE TRANSFER + SEDIMENT + DISTRIBUTION

075960
HERCEG JE
ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY, JULY THROUGH DECEMBER 1971
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-4970 +. 48 PAGES, TABLES, FIGURES, REFERENCES, JULY 1972

THE ENVIRONMENTAL MONITORING PROGRAM IN EFFECT AT THE LOS ALAMOS SCIENTIFIC LABORATORY OF THE UNIVERSITY OF CALIFORNIA FOR THE LAST HALF OF CALENDAR YEAR 1971 IS DESCRIBED. RESULTS OF PROGRAMS DESIGNED TO MONITOR RADIATION LEVELS IN THE LABORATORY ENVIRONS, INCLUDING THE ATMOSPHERE, LOCAL SURFACE AND GROUND WATERS, SEDIMENTS AND SOILS ARE PRESENTED. THESE MEASUREMENTS ARE USED TO MAKE ESTIMATES OF THE DOSE COMMITMENTS DUE TO PLUTONIUM AND TRITIUM CONCENTRATIONS IN AIR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*PLUTONIUM + *ATMOSPHERIC POLLUTION + AIR + *MONITOR, ENVIRONMENTAL + GROUND WATER, NUCLIDE OCCURRENCE + *SURVEY, RADIATION + *DOSE MEASUREMENT, EXTERNAL + *LASL + MONITOR, GROUND SURFACE + SOIL + SURVEILLANCE PROGRAM + *MONITOR, AREA + CONCENTRATION + SEDIMENT

076433
ANDERSON KD
ENVIRONMENTAL RADIOACTIVITY MEASUREMENT EXPERIENCE NEAR A FUELS REPROCESSING PLANT
N.Y. STATE DEPT. OF ENVIRONMENTAL CONSERVATION
2 PAGES, 4 REFERENCES, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 15(1), PP. 544-545, FROM THE 1972 ANNUAL

076433 *CONTINUED*
MEETING, LAS VEGAS, NEVADA, JUNE 18-22, 1972

EXTENSIVE MEASUREMENTS OF RADIOACTIVE MATERIALS HAVE BEEN MADE IN THE ENVIRONS OF THE NUCLEAR FUELS SERVICES REPROCESSING PLANT AS PART OF NEW YORK STATE'S ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM. BACKGROUND MEASUREMENTS OF GAMMA DOSE RATES AND RADIOACTIVITY CONCENTRATIONS IN AIR, MILK, WATER, AND FISH WERE STARTED TWO YEARS PRIOR TO PLANT STARTUP. RADIOACTIVITY CONCENTRATIONS AND GAMMA DOSE RATES WERE TYPICAL OF RADIOACTIVITY CONCENTRATIONS FOUND IN OTHER PARTS OF THE STATE. FUTURE, AND PRESENTLY UNKNOWN DOSES DUE TO I129, KR85, AND H3 MAY BE SIGNIFICANT. BECAUSE OF THE RECENT STARTUP OF A LOW-LEVEL LIQUID WASTE TREATMENT PLANT, DOSES DUE TO SR90 AND CS137 IN VECTORS ASSOCIATED WITH THE STREAM SYSTEM SHOULD DECREASE AS THE CONCENTRATION OF THESE ISOTOPES IS REDUCED.

AVAILABILITY - KURT D. ANDERSON, NEW YORK STATE, DEPT. OF ENVIRONMENTAL CONSERVATION, 50 WOLF ROAD, ALBANY, N.Y. 12201

CESIUM + IODINE + KRYPTON + *MEASUREMENT + STRONTIUM + *WATER + *AIR + *MILK + *MONITOR, BACKGROUND + GAMMA EMITTER + *NFS + *FUEL REPROCESSING + SURVEILLANCE PROGRAM + *MONITOR, AREA + ANIMAL, FISH + *CONCENTRATION

077398
SHMUKLARSKY MJ
ENVIRONMENTAL RADIOACTIVITY IN ILLINOIS, 1970
ENVIRONMENTAL PROTECTION AGENCY
30 PAGES, 30 TABLES, 3 FIGURES, 46 REFERENCES, RADIATION DATA AND REPORTS, 13(11), PP. 589-618 (NOVEMBER 1972)

THE CONTRIBUTION OF RADIOACTIVITY TO THE ILLINOIS ENVIRONMENT DURING 1970 RESULTING FROM THE OPERATION OF NUCLEAR POWER PLANTS AND FROM OTHER MAJOR NATURAL AND MANMADE SOURCES IS PRESENTED. THE ENVIRONMENTAL SURVEILLANCE PROGRAMS OF THE DRESDEN, QUAD-CITIES, AND ZION NUCLEAR STATIONS ARE DESCRIBED. DRESDEN UNIT 1 RADIOACTIVE GASEOUS AND LIQUID RELEASES FOR THE PAST 11 YEARS, AND DRESDEN UNIT 2 DISCHARGES FOR 1970 ARE SUMMARIZED. ON THE BASIS OF DATA GATHERED DURING 1970, IT IS CONCLUDED THAT THE EFFECT OF NUCLEAR POWER PLANT OPERATIONS ON THE RADIOACTIVITY LEVEL OF MOST ENVIRONMENTAL MEDIA WAS HARDLY DISTINGUISHABLE FROM THE NATURAL AND FALLOUT RADIOACTIVITY.

CESIUM + *DRESDEN 1 (BWR) + EFFLUENT + KRYPTON + NOBLE GAS + STRONTIUM + *SURVEY, ENVIRONMENT + XENON + *REACTOR, POWER + MONITOR, ENVIRONMENTAL + *SURVEY, RADIATION + MONITOR, BACKGROUND + DRESDEN 2 (BWR) + *QUAD CITIES 1 (BWR) + *SURVEILLANCE PROGRAM + *ZION 1 (PWR) + ZION 2 (PWR) + QUAD CITIES 2 (BWR)

077945
MAWSON CA + COWPER G
ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972
ATOMIC ENERGY OF CANADA, LTD., CHALK RIVER
AECL-4272 +, 32 PAGES, 3 FIGURES, SEPTEMBER 1972

EFFLUENTS AND NEARBY NATURAL WATERS WERE MONITORED FOR RADIONUCLIDES. A METHOD FOR DETERMINATION OF LOW LEVELS OF STABLE COBALT WAS DEVELOPED. STUDIES WERE INITIATED ON RADIOACTIVE AND STABLE SR IN LAKE SEDIMENT, ON THE TRITIUM INPUT TO A LAKE VIA GROUND WATER, AND OF THE ROLE OF TRITIUM RETENTION BY SOIL ON THE EVAPORATION OF TRITATED WATER FROM ECOSYSTEMS. UPTAKE OF PHOSPHATE AND FERRIC IONS BY AQUATIC PLANTS OCCURRED THROUGH THE ROOTS, EVEN IN FLOATING SPECIES WITH SUBMERGED ABSORBENT LEAVES. MONITORING METHODS WERE DEVELOPED FOR T AND I IN AIR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CESIUM + COBALT + IODINE + MONITOR, LIQUID + STRONTIUM + TRACER, RADIOACTIVE + SURFACE WATER, NUCLIDE OCCURRENCE + GROUND WATER, NUCLIDE OCCURRENCE + IRON + PHOSPHATE + SOIL, NUCLIDE OCCURRENCE + CRITICAL NUCLIDE PATHWAY + *CHALK RIVER + METEOROLOGY + WATER POLLUTION + MONITORING PROGRAM, ENVIRONMENTAL + LAKE + *RADIONUCLIDE UPTAKE + *ECOSYSTEM, AQUATIC + RADIONUCLIDE TRANSFER + SEDIMENT + INSECT + RADIATION MONITORS + INSTRUMENTS, MISC.

078012
HARDY EP
FALLOUT PROGRAM QUARTERLY SUMMARY REPORT
U.S. ATOMIC ENERGY COMMISSION, HEALTH AND SAFETY LABORATORY
HASL-268 +, 175 PAGES, FIGURES, JANUARY 1, 1973

THIS REPORT PRESENTS CURRENT DATA FROM THE HASL FALLOUT PROGRAM, THE NATIONAL RADIATION LABORATORY IN NEW ZEALAND, AND THE EURATOM JOINT NUCLEAR RESEARCH CENTRE AT ISPRA, ITALY. THE INITIAL SECTION CONSISTS OF INTERPRETIVE REPORTS ON STRONTIUM-90 FALLOUT OVER THE ATLANTIC, FALLOUT TRITIUM AND DOSE COMMITMENT, AND QUALITY CONTROL ANALYSES OF SURFACE AIR, FALLOUT, DIET, AND BONE ANALYSES DURING 1971. SUBSEQUENT SECTIONS INCLUDE TABULATIONS OF RADIONUCLIDE LEVELS IN FALLOUT, SURFACE AIR, STRATOSPHERIC AIR, MILK, AND TAP WATER. A BIBLIOGRAPHY OF RECENT PUBLICATIONS RELATED TO RADIONUCLIDE STUDIES, IS ALSO PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ELEMENTS AND ISOTOPES + *FALLOUT + *MEASUREMENT + *STRONTIUM + *WATER + ANALYTICAL TECHNIQUE + MILK + DIETARY HABIT + ITALY + RADIOCHEMICAL ANALYSIS + NEW ZEALAND + UNITED STATES + *SURVEILLANCE PROGRAM + *DATA COLLECTION + *CONCENTRATION + OCEAN, ATLANTIC + BONE + MAN

078449
ENVIRONMENTAL MONITORING REPORT: PERIOD COVERING MAY 1, 1972 - JULY 31, 1972
EBERLINE INSTRUMENT CORPORATION, SANTE FE, NEW MEXICO
PNE-WW-23 +. 22 PAGES, 1972

THE RADIOLOGICAL MONITORING PROGRAM FOR PROJECT WAGON WHEEL WAS INITIATED IN MAY 1971. THE PROGRAM WILL CONTINUE INDEFINITELY UNTIL SUCH TIME AS THERE IS NO FURTHER NEED FOR RADIOLOGICAL MONITORING. THE MEASUREMENT OF BACKGROUND RADIATION AND ENVIRONMENTAL RADIOACTIVITY LEVELS IS INTENDED TO SERVE THE FOLLOWING PURPOSES - (A) TO YIELD AVERAGE VALUES FOR RADIATION LEVELS AND CONCENTRATIONS OF RADIOACTIVE MATERIAL IN VARIOUS MEDIA IN THE ENVIRONMENT; (B) TO IDENTIFY OPTIMUM SAMPLE LOCATIONS; (C) TO DOCUMENT SEASONAL VARIATIONS; (D) TO INDICATE THE RANGE OF VALUES THAT SHOULD BE CONSIDERED "BACKGROUND"; (E) TO PROOF-TEST THE ENVIRONMENTAL MONITORING EQUIPMENT AND PROCEDURES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

STRONTIUM + *SAMPLING + *SURFACE WATER, NUCLIDE OCCURRENCE + *MILK + *WATER, DRINKING + MONITOR, ENVIRONMENTAL + *GROSS BETA + MONITOR, BACKGROUND + *CONCENTRATION + RADIATION MONITORS

079183
RADIATION DATA
40 PAGES, FIGURES, TABLES, RADIATION DATA AND REPORTS, 14(1), PP. 17-57 (JANUARY 1973)

REPORTS DATA PROVIDED BY FEDERAL, STATE, AND FOREIGN GOVERNMENTAL AGENCIES AND OTHER COOPERATING ORGANIZATIONS. DATA REPORTED IS ACCUMULATED FROM SURVEILLANCE PROGRAMS CONCERNING RADIONUCLIDE CONCENTRATIONS OF MILK, FOOD, WATER, AIR AND DEPOSITION. ALSO, GIVEN ARE ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT SOME ATOMIC ENERGY COMMISSION INSTALLATIONS. SOME OF THE MORE IMPORTANT RADIOISOTOPES OF CONCERN ARE STRONTIUM, CESIUM, IODINE, BARIUM, COBALT, TRITIUM, XENON, AND KRYPTON. CONCENTRATIONS OF THESE ARE GIVEN FOR VARIOUS MEDIA.

BARIUM + CESIUM + DEPOSITION + EFFLUENT + ELEMENTS AND ISOTOPES + IODINE + PLUTONIUM + STRONTIUM + ATMOSPHERIC POLLUTION + SAMPLING + MILK + WATER, DRINKING + POPULATION EXPOSURE + WATER POLLUTION + SURVEILLANCE PROGRAM + DATA COLLECTION + CONCENTRATION + FOOD CHAIN + BONE + MAN + AGENCY, AEC + FOOD + ENVIRONMENTAL PROTECTION AGENCY (EPA)

079362
PAYNE DW + GROSSMAN RF
OFF-SITE RADIOLOGICAL SAFETY PROGRAM FOR PROJECT RULISON RE-ENTRY PORTION OF PHASE III
NATIONAL ENVIRONMENTAL RESEARCH CENTER, LAS VEGAS
NERC-LV-539-14 +. 263 PAGES, FIGURES, TABLES, REFERENCES, NOVEMBER 1972

PRESENTS THE OPERATIONAL PROCEDURES AND RESULTS OF THE OFF-SITE RADIOLOGICAL SURVEILLANCE ACTIVITIES CONDUCTED BY THE NATIONAL ENVIRONMENTAL RESEARCH CENTER-LAS VEGAS FROM APRIL 1970 TO OCT. 3, 1970, DURING THE RE-ENTRY PHASE OF THE PORJECT RULISON PRODUCTION TESTING PROGRAM. NO RELEASE OF RADIOACTIVITY OCCURRED DURING RE-ENTRY OPERATIONS; HOWEVER, GAS FLARING DURING AUGUST RELEASED NATURAL GAS CONTAINING SOME RADIOACTIVITY TO THE ATMOSPHERE. THE ONLY ACTIVITY DETECTED IN THE OFF-SITE AREA WAS TRITIUM IN ATMOSPHERIC MOISTURE SAMPLES COLLECTED AT TWO REMOTE, UNPOPULATED LOCATIONS NEAR THE TEST WELL DURING A FLARING OPERATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLOWSHARE + *SURVEY, ENVIRONMENT + TESTING + ATMOSPHERIC POLLUTION + *SURVEY, RADIATION + *INCINERATION + *RADIOACTIVITY RELEASE + SURVEILLANCE PROGRAM + *GAS + *OFF SITE

079363
ESSINGTON EH
AN INTERIM SUMMARY OF TRITIUM DATA FOR STS "A", AMCHITKA ISLAND, ALASKA, JULY 1, 1970 THROUGH JUNE 30, 1971
TELEDYNE ISOTOPES, LAS VEGAS
NVO-1229-172 +. 75 PAGES, SEPTEMBER 1971

RESULTS OF TRITIUM ANALYSES FOR THE PERIOD OF JULY 1, 1970 THROUGH JUNE 30, 1971, ARE TABULATED. THESE DATA ALONG WITH SUMMARIES OF DATA REPORTED IN PRIOR YEARS ARE USED TO DETERMINE IF EXPLOSION-PRODUCED RADIOACTIVITY HAS BEEN DEPOSITED IN ENVIRONMENTAL WATERS BY THE MILROW EVENT EXECUTED OCT. 2, 1969.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*DEPOSITION + OCEAN AND SEA + *NUCLEAR DETONATION + *SOIL, NUCLIDE OCCURRENCE + *WATER POLLUTION + ALASKA + COMPARISON

079392
HELD EE
AMCHITKA RADIOBIOLOGICAL PROGRAM PROGRESS REPORT, MAY 1971 TO FEBRUARY 1972
UNIVERSITY OF WASHINGTON, SEATTLE
NVO-269-17 +. 52 PAGES, 19 TABLES, 5 FIGURES, 4 REFERENCES, OCTOBER 1972

NO RELEASE OF RADIOACTIVITY AS A RESULT OF THE CANNIKIN TEST WAS FOUND, ALTHOUGH RADIOACTIVITY FROM WORLDWIDE FALLOUT WAS DETECTED BY GAMMA SPECTROMETRY OF INDICATOR ORGANISMS (SEAWEEDS IN THE INTERTIDAL ZONE, MOSS AND HIGHER PLANTS IN THE STREAMS, AND LICHEN). THE MOST ABUNDANT

079392 *CONTINUED*
RADIONUCLIDE DETECTED BY MILLIPORE-FILTER SAMPLING OF PARTICULATES AT INTERTIDAL AND FRESHWATER STATIONS WAS ZR95-NB95. THE SENSITIVITY WAS ABOUT 0.001 PICOCURIE/LITER (A THOUSAND-FOLD BETTER THAN BY A DIRECT GAMMA PROBE WITH A ONE-HOUR COUNT). FE55 IN CANNED SALMON FROM THE 1971 BRISTOL-BAY PACK FALLS WITHIN THE RANGE FOR FISH MUSCLE SAMPLED IN 1969-1970. TRITIUM LEVELS IN SALMON AND MARINE INVERTEBRATES (KING CRAB, STONE CRAB, SCALLOPS, SHRIMP) WERE COMPARABLE FOR THE AMCHITKA REGION TO OTHER ALASKAN AREAS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

CRUSTACEAN + NIOBIUM + OCEAN AND SEA + ZIRCONIUM + FILTER, MILLIPORE + SAMPLING + SURFACE WATER, SUSPENDED MATERIAL + ANALYTICAL TECHNIQUE + CRITICAL NUCLIDE PATHWAY + SPECTROMETRY, GAMMA + *ALASKA + *RADIONUCLIDE UPTAKE + ANIMAL, INVERTEBRATE + *ANIMAL, FISH + ECOSYSTEM, AQUATIC + FOOD CHAIN + AQUATIC ORGANISM + PLANT, SPERMATOPHYTE + MARINE ORGANISM + PLANT, ALGAE/FUNGI + ECOSYSTEM, MARINE + PLANT, MOSS/FERN + ECOSYSTEM, ESTUARINE

079785
OCHIAI T + KAWASAKI H
TRITIUM IN THE GROUNDWATER IN JAPAN
AGRICULTURAL ENGINEERING RESEARCH STATION, HIRATSUKA, JAPAN
7 PAGES, YOSUI TO HAISUI, 14(3), PP. 255-261 (MARCH 1972)

THE FOLLOWING METHODS FOR MEASURING TRITIUM ARE DESCRIBED - MEASUREMENTS BY LIQUID SCINTILLATION OF WATER SAMPLES; MEASUREMENT OF GAS SAMPLES BY A GAS PROPORTIONAL COUNTER; AND MEASUREMENT OF GAS SAMPLES BY AN IONIZATION CHAMBER. THE MERITS AND DEMERITS OF THE METHODS ARE DISCUSSED.

*GROUND WATER + *MEASUREMENT + *WATER + SAMPLING + *GROUND WATER, NUCLIDE OCCURRENCE + GAS + *CONCENTRATION

080212
COCHRAN JA + GRIFFIN WR + TROIANELLO EJ
OBSERVATION OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING PLANT
U.S. ENVIRONMENTAL PROTECTION AGENCY
EPA/ORP 73-1 +. 28 PAGES, 11 TABLES, 2 FIGURES, 15 REFERENCES, FEBRUARY 1973

A STUDY WAS CONDUCTED AT NUCLEAR FUEL SERVICES, INC. (NFS) TO (A) CHARACTERIZE THE STACK TRITIUM EFFLUENT IN THE GASEOUS AND WATER VAPOR FORMS, DURING NORMAL PLANT OPERATIONS, (B) DETERMINE THE WEEKLY AVERAGE TRITIUM AIR CONCENTRATIONS AT FIVE SELECTED SITES AROUND THE PLANT OVER A 4-MONTH PERIOD, (C) EVALUATE METHODS USED FOR SAMPLING AT THE STACK AND IN THE ENVIRONMENT, AND (D) ESTIMATE THE DOSE TO THE POPULATION IN THE IMMEDIATE VICINITY OF THE PLANT FROM TRITIUM STACK EFFLUENTS. DATA FOR THE FIVE AIR SAMPLING STATIONS AROUND THE SITE INDICATE THAT THE PLANT CONTRIBUTION TO THE ATMOSPHERE IS SMALL.

AVAILABILITY - U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, FIELD OPERATIONS DIVISION, WASHINGTON, D.C. 20460

DOSE + EFFLUENT + *ATMOSPHERIC POLLUTION + MONITOR, AIR + MONITOR, GAS + MONITOR, SAMPLING + *STACK + POPULATION EXPOSURE + *RADIOACTIVITY RELEASE + *WATER VAPOR + *FUEL REPROCESSING + *GAS + CONCENTRATION

080827
BARTON CJ + MOORE RE + HANNA SR
RADIATION DOSES FROM HYPOTHETICAL EXPOSURES TO RULISON GAS
CONF-720614-9 +. 48 PAGES, PAPER PRESENTED AT THE 17TH ANNUAL MEETING OF THE HEALTH PHYSICS SOCIETY, HELD IN LAS VEGAS, NEVADA, ON JUNE 12, 1972

PRODUCTION TESTING OF THE RULISON WELL, THE SECOND NATURAL GAS WELL DEVELOPED BY USE OF NUCLEAR EXPLOSIVES, WAS COMPLETED IN APRIL 1971. THIS STUDY EXAMINED THE HYPOTHETICAL SITUATION THAT WOULD HAVE RESULTED IF THE DRY, CARBON DIOXIDE-FREE GAS ORIGINALLY PRESENT IN THE WELL HAD BEEN WITHDRAWN AT A RATE OF 1 MILLION FT3/DAY AND DISTRIBUTED BY TWO GAS COMPANIES TO SMALL COMMUNITIES IN THE AREA NEAR THE WELL. TRITIUM AND KR-85 ARE THE PRINCIPAL RADIONUCLIDES PRESENT IN THE GAS FROM THE RULISON WELL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

INHALATION + KRYPTON + *PLOWSHARE + *NUCLEAR DETONATION + POPULATION EXPOSURE + *DOSE CALCULATION, EXTERNAL + CONTAMINATION + *GAS + CONSUMER PRODUCT + ABSORPTION + *STIMULATION + RESOURCE, NATURAL

081022
ECKERT JA + EVANS RB
TRITIUM BURDENS IN TWO ARCTIC VILLAGES
U.S. ENVIRONMENTAL PROTECTION AGENCY, LAS VEGAS, NEVADA
3 PAGES, 2 TABLES, 3 FIGURES, 6 REFERENCES, RADIATION DATA AND REPORTS, 14(5), PP. 273-275 (MAY 1973)

DURING A ROUTINE VISIT TO MEASURE CESIUM-137 BURDENS IN RESIDENTS OF TWO ALASKAN VILLAGES, DRINKING WATER AND URINE SAMPLES WERE COLLECTED AND SUBSEQUENTLY ANALYZED FOR TRITIUM BY THE NATIONAL ENVIRONMENTAL RESEARCH CENTER-LAS VEGAS. THE MEAN CONCENTRATIONS AT NOATAK, ALASKA, WERE 1200 PCI/LITER AND 1500 PCI/LITER FOR TRITIUM IN DRINKING WATER AND URINE, RESPECTIVELY. AT KIANA, THE MEAN TRITIUM CONCENTRATION IN DRINKING WATER WAS <400 PCI/LITER, AND THE MEAN TRITIUM CONCENTRATION IN URINE WAS 1000 PCI/LITER.

081022 *CONTINUED*
*CESIUM + *MEASUREMENT + *WATER, DRINKING + ALASKA + EXCRETION, URINE + BODY BURDEN

081023
RADIATION DATA, MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA
54 PAGES, FIGURES, RADIATION DATA AND REPORTS, 14(5), PP. 277-331 (MAY 1973)

REPORTS DATA PROVIDED BY FEDERAL, STATE, FOREIGN GOVERNMENTAL AGENCIES, AND OTHER COOPERATING ORGANIZATIONS. DATA REPORTED WERE ACCUMULATED FROM SURVEILLANCE PROGRAMS CONCERNING RADIONUCLIDE CONCENTRATIONS IN MILK, FOOD, WATER, AND AIR AND DEPOSITION. ALSO GIVEN ARE ENVIRONMENTAL LEVELS OF RADIOACTIVITY AT SOME ATOMIC ENERGY COMMISSION INSTALLATIONS. SOME OF THE MORE IMPORTANT RADIOISOTOPES OF CONCERN ARE STRONTIUM, CESIUM, IODINE, BARIUM, COBALT, XENON, KRYPTON, AND PLUTONIUM.

BARIUM + CESIUM + COBALT + DEPOSITION + IODINE + KRYPTON + PLUTONIUM + STRONTIUM + WATER + XENON + AIR + MILK + MONITOR, ENVIRONMENTAL + *SURVEY, RADIATION + *POPULATION EXPOSURE + SOIL + *SURVEILLANCE PROGRAM + *DATA COLLECTION + CONCENTRATION + RADIATION EXPOSURE + FOOD

081445
REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-5234-MS +. 9 PAGES, 7 TABLES, 5 FIGURES, 3 REFERENCES, APRIL 1973

SURFACE AND GROUND WATER SAMPLES WERE ANALYZED FOR TRITIUM FROM 113 SAMPLING STATIONS DURING THE PERIOD AUGUST 1966 THROUGH MAY 1969. TRITIUM WAS DETECTED ONLY IN SURFACE AND GROUND WATER IN THE STREAM-CONNECTED AQUIFERS IN THE ALLUVIUM OF DP, LOS ALAMOS, AND MORTANDAD CANYONS WHICH ARE CONTROLLED AREAS. THESE CANYONS RECEIVE TREATED LOW-LEVEL RADIOACTIVE EFFLUENTS. THE TRITIUM IN DP AND LOS ALAMOS CANYON IS FROM OLD SEEPAGE PITS THAT CONTAINED TRITIUM. THE TRITIUM CONCENTRATIONS DECREASE DOWNGRADIENT IN THE CANYONS DUE TO DILUTION WITH OTHER WASTE WATER, SEWAGE EFFLUENT, AND STORM RUNOFF.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DECONTAMINATION + DILUTION + GROUND WATER + SURFACE WATER + *SURVEY, RADIATION + *LASL + MONITOR, AREA + *CONCENTRATION

082225
MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY
U.S. ATOMIC ENERGY COMMISSION, TECHNICAL INFORMATION CENTER
TID-3337 +. 100 PAGES, MAY 1973

A SELECTED BIBLIOGRAPHY OF 351 REFERENCES ON TRITIUM. THE REFERENCES WERE RETRIEVED FROM NSA DATA BASE BY COMPUTER SEARCH AND INDEXING. REFERENCES ARE ARRANGED IN A SOMEWHAT CHRONOLOGICAL ORDER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*BIBLIOGRAPHY + *WASTE DISPOSAL + MONITOR + RADIATION SAFETY AND CONTROL

082302
OSBORNE RV
ENVIRONMENTAL MONITORING TECHNIQUES
CHALK RIVER NUCLEAR LABORATORIES, ONTARIO, CANADA
60 PAGES, PP. 496-556 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

DISCUSSES SUCH TOPICS AS MONITORING REACTOR EFFLUENTS, ANALYTICAL TECHNIQUES, MONITORING IN AQUATIC ENVIRONMENT AND SUBSEQUENT ANALYSIS OF TRITIUM IN WATER, A METHOD FOR AIR AND GAS SAMPLING, STACK MONITOR, AND A MONITOR FOR NATURAL GAS FROM NUCLEAR STIMULATION.

MONITOR, STACK + PLOWSHARE + *WATER + MONITOR, GAS + *SAMPLING + AIR + *ANALYTICAL TECHNIQUE + *MONITOR, ENVIRONMENTAL + MONITOR, AREA + GAS + STIMULATION + HPIS

082303
KRIEGER HL + GOLD S + KAHN B
ENVIRONMENTAL MONITORING DATA
NATIONAL ENVIRONMENTAL RESEARCH CENTER, CINCINNATI
89 PAGES, PP. 557-646 OF 'TRITIUM', PUBLISHED BY MESSENGER GRAPHICS, PHOENIX, ARIZONA, MAY 1973 (BOOK)

DEALS WITH MONITORING AND DATA COLLECTION OF RELEASES FROM THE VARIOUS SOURCES. INCLUDED IN THESE SOURCES ARE NUCLEAR POWER REACTORS, CONTAMINATION BY NUCLEAR POWER PROGRAMS, PROJECT RULISON, PROCESSING OPERATIONS OF GASBUGGY GAS, ACCIDENTAL TRITIUM RELEASE, AND TRITIUM INTAKE IN NEW YORK CITY.

INGESTION + INHALATION + *SOURCE, RADIATION + *ACCIDENT, MONITOR + REACTOR, POWER + *MONITOR, ENVIRONMENTAL + NUCLEAR DETONATION + *POPULATION EXPOSURE + CONTAMINATION + EMERGENCY PROCEDURE + FISSION PRODUCT, AIRBORNE + MONITOR + RADIOACTIVITY RELEASE + EXCAVATION, NUCLEAR + LACROSSE (BWR) + GAS + OFF SITE + *DATA COLLECTION + PLANT + RESOURCE, NATURAL + HPIS

082823
KIPP KL
RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT - JANUARY-JUNE 1972
BATTELLE PACIFIC NORTHWEST LABORATORIES, RICHLAND, WASHINGTON
BNWL-1737 +. 31 PAGES, 9 TABLES, 3 FIGURES, JUNE 1972

THIS REPORT IS PREPARED SEMI-ANNUALLY TO PROVIDE AN EVALUATION OF THE STATUS OF GROUNDWATER CONTAMINATION RESULTING FROM DISPOSAL OF HANFORD PLANT EFFLUENTS. THE DATA PRESENTED IN THIS REPORT WERE COLLECTED DURING THE FIRST SIX MONTHS OF 1972

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COBALT + EFFLUENT + ELEMENTS AND ISOTOPES + *GROUND WATER + RUTHENIUM + WASTE DISPOSAL + *GROUND WATER, NUCLIDE OCCURRENCE + CONTAMINATION + *HANFORD SITE + *SAFETY EVALUATION + CONCENTRATION

083413
HELD EE + NELSON VA + SCHELL WR + IKWD
AMCHITKA RADIOBIOLOGICAL PROGRAM PROGRESS REPORT FOR MARCH 1972 TO DECEMBER 1972
WASHINGTON UNIVERSITY, SEATTLE
NVO-269-19 +. 90 PAGES, 27 TABLES, 9 FIGURES, 18 REFERENCES, JUNE 1973

AN EXTENSIVE SEARCH WITH SENSITIVE INSTRUMENTS FOR RADIONUCLIDES IN BIOLOGICAL AND ENVIRONMENTAL SAMPLES (MARINE, TERRESTRIAL, FRESHWATER) COLLECTED DURING THE FIRST 14 MONTHS AFTER THE CANNIKIN DETONATION INDICATES NO CONTAMINATION OF THE SURFACE ENVIRONMENT. RECENT DATA INDICATES (1) NO NEW RADIONUCLIDES, EXCEPT THAT BE7 WAS INCLUDED IN THE RADIONUCLIDES THAT WERE DETERMINED, AND (2) AN IMPROVEMENT IN THE SENSITIVITY OF ANALYSIS FOR TRITIUM TO ABOUT 15 TRITIUM UNITS. THE PAST AND PRESENT ANALYSES ARE SUMMARIZED, INCLUDING GAMMA-EMITTING RADIONUCLIDES IN AIR FILTERS, SEAWATER, FRESHWATER, MARINE ALGAE, MARINE INVERTEBRATES, MARINE FISH, SEA OTTER, AND FRESHWATER ORGANISMS (MOSS, PLANTS, AND FISH); SR90 IN RATS AND BIRDS; AND TRITIUM IN SEAWATER, FRESHWATER AND FISH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

BERYLLIUM + FALLOUT + STRONTIUM + *POTASSIUM + NUCLEAR DETONATION + CRITICAL NUCLIDE PATHWAY + ALASKA + *RADIONUCLIDE UPTAKE + FOOD CHAIN + AQUATIC ORGANISM + SEDIMENT + MARINE ORGANISM + CONCENTRATION FACTOR + *ECOSYSTEM, ESTUARINE

088469
ENVIRONMENTAL ISOTOPE DATA NO. 4: WORLD SURVEY OF ISOTOPE CONCENTRATION IN PRECIPITATION (1968T1969)
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
IAEA SERIES NO. 147 +. 333 PAGES, 1973

REPORTS THE CONCENTRATION OF THE ENVIRONMENTAL ISOTOPES (TRITIUM, DEUTERIUM AND OXYGEN-18) IN MONTHLY SAMPLES OF PRECIPITATION TAKEN FROM A GLOBAL NETWORK OF 177 STATIONS IN 1968-1969. SELECTED METEOROLOGICAL DATA, SUCH AS AMOUNTS OF PRECIPITATION, THE VAPOUR PRESSURES AND TEMPERATURES ARE ALSO PRESENTED, TOGETHER WITH REPORTS OF PRE-1968 DATA.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, NEW YORK, 10016

DEUTERIUM + *ELEMENTS AND ISOTOPES + OXYGEN + *SURVEY, ENVIRONMENT + *PRECIPITATION + INTERNATIONAL + DATA COLLECTION

092023
NUCLEAR SAFETY PROJECT - THIRD PROJECT REPORT/FIRST HALF OF 1973
KERNFORSCHUNGSZENTRUM, KARLSRUHE, F. R. GERMANY
KFK-1859 +. 735 PAGES, FIGURES, REFERENCES, NOVEMBER 1973

DESCRIBES THE ACTIVITIES OF THE PROJECT FOR THE FIRST 6 MONTHS OF 1973. SUBJECTS INCLUDE DEVELOPMENT OF FILTER AND OFF-GAS SYSTEMS, MEASUREMENT OF ENVIRONMENTAL TRITIUM CONCENTRATION, KRYPTON AND XENON REMOVAL FROM THE EXHAUST AIR OF NUCLEAR PLANTS, FUEL ROD BEHAVIOR DURING LOCA, CORE MELTDOWN OF LIGHT-WATER REACTORS, AND RISK ANALYSIS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FILTER SYSTEM + KRYPTON + ACCIDENT, LOSS OF COOLANT + XENON + CORE MELTDOWN + GERMANY + OFF GAS + *SAFETY PROGRAM + R AND D PROGRAM

094616
OSTLUND HG
A SAMPLING SYSTEM FOR ATMOSPHERIC HT AND HTO
UNIVERSITY OF MIAMI, FLORIDA
3 PAGES, 3 FIGURES, IEEE TRANS. ON NUCLEAR SCIENCE, NS-21(1), PP. 510-512 (FEBRUARY 1974)

A SYSTEM IS BRIEFLY DESCRIBED, WHICH IS DESIGNED FOR THE SAMPLING OF TRITIUM GAS (HT AND T SUB 2) AND TRITIATED WATER VAPOR IN THE AIR AT LEVELS FAR BELOW MPC AND DOWN TO PRESENT-DAY ATMOSPHERIC BACKGROUND LEVELS. THE TRITIUM GAS IS EXTRACTED FROM THE AIR BY CATALYTIC COMBUSTION ON PD AT AMBIENT TEMPERATURE. THE RESULTANT WATER IS ABSORBED ON MOLECULAR SIEVE CARRYING THE PD. THE SYSTEM IS WELL SUITED FOR FIELD WORK. PRESENT-DAY WORLD-WIDE HT LEVELS ARE ABOUT 2.3 PCI/KG AIR,

094616 *CONTINUED*
AND THE HTO LEVELS ABOUT THE SAME IN THE TROPOSPHERE.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

*INSTRUMENT, AIR SAMPLING + MONITOR, SAMPLING

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

ABSORPTION
080822 P 34
ACCELERATOR
009511 P 5
ACCIDENT, LOSS OF COOLANT
092023 P 36
ACCIDENT, MONITOR
067941 P 25 082303 P 35
ACCIDENT, RADIOISOTOPE
067941 P 25
ACTIVATION
069850 P 26
ACTIVATION PRODUCT
008175 P 5 015959 P 10
ACTIVITY BUILDUP
039936 P 16
ADMINISTRATIVE CONTROL
036604 P 15
ADSORPTION
043090 P 16
AECL
069850 P 26
AEROSOL
022001 P 11 025597 P 12
AGENCY, AEC
025597 P 12 048324 P 18 064274 P 22 072249 P 28
073928 P 28 079183 P 33
AGRICULTURE
005143 P 1 005145 P 1 005148 P 2 005154 P 2
005170 P 2 005171 P 2 005183 P 3 005381 P 3
015959 P 10
AI
005171 P 2
AIR
007462 P 4 008493 P 5 009406 P 5 013345 P 6
013618 P 7 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9 015767 P 10
015959 P 10 016978 P 11 022001 P 11 032834 P 14
034486 P 15 035384 P 15 036604 P 15 039936 P 16
048324 P 18 058859 P 20 061408 P 21 064274 P 22
064768 P 22 064785 P 22 064889 P 23 066047 P 24
072141 P 27 072249 P 28 073660 P 28 074531 P 29
074869 P 30 075960 P 31 076433 P 31 081023 P 35
082302 P 35
AIR CLEANING
007430 P 4
AIRBORNE RELEASE
025581 P 12
AIRCRAFT
025597 P 12 073004 P 28
ALASKA
057383 P 20 074003 P 29 074859 P 30 079363 P 33
079392 P 33 081022 P 34 083413 P 36
ALPHA EMITTER
032538 P 14
AMERICIUM
008175 P 5
ANALYTICAL TECHNIQUE
005170 P 2 005171 P 2 007082 P 4 013347 P 6
013795 P 9 013799 P 10 013806 P 10 027977 P 13
029905 P 13 030348 P 13 034486 P 15 035384 P 15
055973 P 19 061936 P 21 066047 P 24 069850 P 26
070063 P 26 070252 P 26 070255 P 26 070616 P 27
072249 P 28 073004 P 28 074003 P 29 074298 P 29
074335 P 29 074869 P 30 075312 P 30 075362 P 31
078012 P 32 079392 P 33 082302 P 35
ANIMAL
015959 P 10 023261 P 12 035384 P 15
ANIMAL, AMPHIBIAN
060609 P 21
ANIMAL, BIRD
060609 P 21
ANIMAL, FISH
064789 P 23 065109 P 24 066272 P 24 066917 P 25
069850 P 26 076433 P 31 079392 P 33
ANIMAL, INVERTEBRATE
060609 P 21 079392 P 33
ANIMAL, REPTILE
060609 P 21
ANIMAL, VERTEBRATE
064768 P 22 064785 P 22 064789 P 23
ANL
005145 P 1 005170 P 2 008493 P 5 064274 P 22
072249 P 28
ANTIMONY
008493 P 5 009406 P 5 013775 P 7 013776 P 7
013777 P 7 013778 P 8 013779 P 8 013780 P 8
013781 P 8 013782 P 8 013783 P 9 013784 P 9
AQUATIC ORGANISM
005148 P 2 005170 P 2 005381 P 3 007047 P 3
007082 P 4 013618 P 7 032537 P 14 044009 P 17
066917 P 25 075362 P 31 079392 P 33 083413 P 36
ARSENIC
015959 P 10
ATMOSPHERIC CIRCULATION
005143 P 1 052994 P 18
ATMOSPHERIC CIRCULATION, GLOBAL
013282 P 6
ATMOSPHERIC DIFFUSION
027910 P 13 032537 P 14
ATMOSPHERIC DIFFUSION, CLIMATOLOGY
025597 P 12 052994 P 18
ATMOSPHERIC DIFFUSION, GLOBAL
025597 P 12 043099 P 16
ATMOSPHERIC POLLUTION
043099 P 16 043102 P 17 064210 P 22 070255 P 26
074335 P 29 075960 P 31 079183 P 33 079362 P 33
080212 P 34
ATMOSPHERIC STABILITY
025597 P 12
AUSTRALIA
064009 P 17
BARIUM
005143 P 1 005145 P 1 005148 P 2 005154 P 2
005170 P 2 005171 P 2 005183 P 3 005381 P 3
008493 P 5 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9 035384 P 15
052994 P 18 074869 P 30 079183 P 33 081023 P 35
BATTELLE NORTHWEST
007122 P 4 015959 P 10 036537 P 15 065087 P 23
BENEFICIAL USE
031269 P 14
BENEFIT VS RISK
031269 P 14
BERYLLIUM
007430 P 4 052994 P 18 083413 P 36
BETA EMITTER
064889 P 23
BETTIS
005183 P 3
BIBLIOGRAPHY
082225 P 35
BIOACCUMULATION/TURNOVER
056139 P 19 060609 P 21 061130 P 21 065092 P 23
065109 P 24 066272 P 24 066917 P 25 069850 P 26
075362 P 31
BIOLOGICAL HALF-LIFE
043102 P 17 064785 P 22
BIOMASS
064789 P 23
BIOMEDICAL
036537 P 15 066272 P 24
BLOOD
064785 P 22
BNL
056741 P 20 064889 P 23 072249 P 28
BODY BURDEN
056180 P 19 074298 P 29 081022 P 34
BONE
064785 P 22 078012 P 32 079183 P 33
BONE, MARROW
061130 P 21
CADMIUM
009406 P 5 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9 025597 P 12
CALCIUM
005143 P 1 005145 P 1 005148 P 2 005154 P 2
005170 P 2 005171 P 2 005183 P 3 007082 P 4
069850 P 26
CALIBRATION
005170 P 2 005171 P 2

CANADA
054494 P 19
CANAL
053772 P 19
CARBON
008306 P 5 009511 P 5 013797 P 9 025597 P 12
031269 P 14 043099 P 16 043102 P 17 051441 P 18
052994 P 18 056139 P 19 056543 P 20 064274 P 22
064785 P 22 064789 P 23 070063 P 26 074869 P 30
CERIUM
005145 P 1 005170 P 2 005381 P 3 008493 P 5
013775 P 7 013776 P 7 013777 P 7 013778 P 8
013779 P 8 013780 P 8 013781 P 8 013782 P 8
013783 P 9 013784 P 9 025597 P 12 051297 P 18
052994 P 18 061130 P 21 069850 P 26
CESIUM
004811 P 1 005143 P 1 005145 P 1 005148 P 2
005154 P 2 005170 P 2 005171 P 2 005183 P 3
005381 P 3 007082 P 4 008493 P 5 009406 P 5
013618 P 7 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9 015959 P 10
025597 P 12 032537 P 14 032834 P 14 035384 P 15
043805 P 17 051297 P 18 052994 P 18 056741 P 20
060609 P 21 061130 P 21 062255 P 21 065087 P 23
065109 P 24 067332 P 25 070063 P 26 074298 P 29
074869 P 30 076433 P 31 077398 P 32 077945 P 32
079183 P 33 081022 P 34 081023 P 35
CHALK RIVER
066272 P 24 069850 P 26 077945 P 32
CHROMIUM
005170 P 2 005381 P 3 015959 P 10 051297 P 18
062255 P 21
COBALT
005145 P 1 005170 P 2 005381 P 3 007082 P 4
008493 P 5 032538 P 14 051297 P 18 056741 P 20
069850 P 26 075362 P 31 077945 P 32 081023 P 35
082823 P 36
CODES AND STANDARDS
036604 P 15 044009 P 17 064210 P 22 072141 P 27
COMMUNITY, PLANT
064789 P 23
COMPARISON
064889 P 23 070252 P 26 079363 P 33
CONCENTRATION
005143 P 1 005148 P 2 005154 P 2 005170 P 2
005171 P 2 005381 P 3 007047 P 3 007082 P 4
008306 P 5 013618 P 7 015959 P 10 022813 P 11
023261 P 12 027977 P 13 031269 P 14 032537 P 14
034486 P 15 035384 P 15 042951 P 16 043090 P 16
043102 P 17 043805 P 17 044669 P 17 045385 P 18
048324 P 18 051272 P 18 055973 P 19 056543 P 20
056741 P 20 058859 P 20 061408 P 21 061936 P 21
062255 P 21 064210 P 22 064274 P 22 064785 P 22
064789 P 23 066047 P 24 067941 P 25 068583 P 25
070063 P 26 070255 P 26 070616 P 27 072141 P 27
072249 P 28 072581 P 28 073660 P 28 073928 P 28
074003 P 29 074298 P 29 074335 P 29 074531 P 29
074589 P 30 074869 P 30 075960 P 31 076433 P 31
078012 P 32 078449 P 32 079183 P 33 079785 P 34
080212 P 34 081023 P 35 081445 P 35 082823 P 36
CONCENTRATION FACTOR
066917 P 25 075362 P 31 083413 P 36
CONCENTRATION, AREA
048324 P 18
CONSUMER PRODUCT
080822 P 34
CONTAINMENT INSTRUMENTATION
075312 P 30
CONTAINMENT LEAK MONITOR
075312 P 30
CONTAINMENT, UNDERGROUND
072581 P 28
CONTAMINATION
025581 P 12 036421 P 15 044009 P 17 074335 P 29
080822 P 34 082303 P 35 082823 P 36
COPPER
015959 P 10
CORE MELTDOWN
092023 P 36
CORRELATION
064785 P 22
COSMIC RADIATION
025597 P 12
COUNTER
007430 P 4 013347 P 6 013795 P 9 013806 P 10
036537 P 15 056543 P 20
COUNTER, WHOLE BODY
005148 P 2 007430 P 4
CRITICAL NUCLIDE
074298 P 29
CRITICAL NUCLIDE PATHWAY
044009 P 17 065092 P 23 074298 P 29 075312 P 30
075362 P 31 075733 P 31 077945 P 32 079392 P 33
083413 P 36
CRUSTACEAN
004695 P 1 004811 P 1 043102 P 17 079392 P 33
CRYSTAL RIVER 3 (PWR)
065109 P 24
CURIUM
008175 P 5
DATA COLLECTION
044669 P 17 064274 P 22 064889 P 23 070616 P 27
072249 P 28 074298 P 29 074869 P 30 078012 P 32
079183 P 33 081023 P 35 082303 P 35 088469 P 36
DATA PROCESSING
070252 P 26 074298 P 29
DECONTAMINATION
007430 P 4 081445 P 35
DEPOSITION
009406 P 5 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9 035384 P 15
043805 P 17 048324 P 18 064274 P 22 070255 P 26
072249 P 28 074869 P 30 079183 P 33 079363 P 33
081023 P 35
DESTRUCTIVE WIND
065087 P 23
DEUTERIUM
007430 P 4 013799 P 10 032537 P 14 069850 P 26
088469 P 36
DIETARY HABIT
005143 P 1 005148 P 2 005154 P 2 005171 P 2
005183 P 3 035384 P 15 045385 P 18 048324 P 18
056180 P 19 064274 P 22 064785 P 22 072249 P 28
074298 P 29 078012 P 32
DILUTION
007047 P 3 007082 P 4 033090 P 14 044832 P 17
081445 P 35
DISPERSION
007082 P 4
DISTRIBUTION
064785 P 22 075733 P 31
DOSE
015959 P 10 034486 P 15 045385 P 18 073660 P 28
080212 P 34
DOSE CALCULATION, EXTERNAL
015959 P 10 067941 P 25 080822 P 34
DOSE CALCULATION, INTERNAL
015959 P 10 023261 P 12 056180 P 19 061130 P 21
075312 P 30
DOSE MEASUREMENT, EXTERNAL
075960 P 31
DOSIMETRY
007047 P 3 007430 P 4 009406 P 5 013775 P 7
013776 P 7 013777 P 7 013778 P 8 013779 P 8
013780 P 8 013781 P 8 013782 P 8 013783 P 9
013784 P 9 032538 P 14 066272 P 24 074869 P 30
DOSIMETRY, THERMOLUMINESCENCE
065092 P 23 066272 P 24 074335 P 29
DOWNWASH
039936 P 16
DRESDEN 1 (BWR)
077398 P 32
DRESDEN 2 (BWR)
077398 P 32
DURATION, GENERATION
064789 P 23
ECOLOGY
004811 P 1 005143 P 1 007047 P 3 043099 P 16
ECONOMICS
008175 P 5
ECOSYSTEM
065087 P 23 065109 P 24
ECOSYSTEM, AQUATIC
065087 P 23 065092 P 23 066272 P 24 069850 P 26
077945 P 32 079392 P 33
ECOSYSTEM, ARCTIC
065087 P 23
ECOSYSTEM, DESERT
065087 P 23
ECOSYSTEM, ESTUARINE
065109 P 24 079392 P 33 083413 P 36
ECOSYSTEM, GRASSLAND
060609 P 21 065087 P 23 065092 P 23
ECOSYSTEM, MARINE
060609 P 21 065092 P 23 065109 P 24 079392 P 33
EFFECT
051297 P 18
EFFECT, AGE
074298 P 29
EFFECT, GENETIC

066272 P 24
EFFECT, SEX
074298 P 29
EFFECT, SOMATIC
066272 P 24
EFFLUENT
006794 P 3 007082 P 4 032537 P 14 036421 P 15
044009 P 17 056741 P 20 062255 P 21 064889 P 23
066272 P 24 067941 P 25 074335 P 29 074865 P 30
077398 P 32 079183 P 33 080212 P 34 082823 P 36
EGG
064785 P 22
ELEMENTS AND ISOTOPES
048324 P 18 064274 P 22 070063 P 26 078012 P 32
079183 P 33 082823 P 36 088469 P 36
ELK RIVER (BWR)
016929 P 10 032834 P 14 039936 P 16 067332 P 25
EMERGENCY PROCEDURE
082303 P 35
ENERGY LEVEL
070252 P 26
ENVIRONMENT
022001 P 11 035384 P 15 039936 P 16 051297 P 18
075312 P 30
ENVIRONMENTAL CONTROL MEASURE
065109 P 24 066047 P 24
ENVIRONMENTAL PROTECTION AGENCY (EPA)
072249 P 28 074869 P 30 079183 P 33
EXCAVATION, NUCLEAR
082303 P 35
EXCRETION, URINE
027977 P 13 064768 P 22 074298 P 29 081022 P 34
EXPOSURE, BACKGROUND
064768 P 22 064785 P 22 064789 P 23 064889 P 23
075312 P 30
FALLOUT
004695 P 1 005143 P 1 005145 P 1 005148 P 2
005154 P 2 005170 P 2 005171 P 2 005183 P 3
005381 P 3 006794 P 3 007430 P 4 008493 P 5
009406 P 5 009511 P 5 013282 P 6 013618 P 7
013775 P 7 013776 P 7 013777 P 7 013778 P 8
013779 P 8 013780 P 8 013781 P 8 013782 P 8
013783 P 9 013784 P 9 015959 P 10 020442 P 11
022813 P 11 025597 P 12 033090 P 14 043805 P 17
061130 P 21 064274 P 22 064785 P 22 064789 P 23
065109 P 24 066917 P 25 070255 P 26 072249 P 28
074335 P 29 074869 P 30 078012 P 32 083413 P 36
FEED MATERIALS PRODUCTION CENTER
005143 P 1
FIELD EXPERIMENT
075362 P 31
FILTER SYSTEM
092023 P 36
FILTER, MILLIPORE
079392 P 33
FILTERS
007430 P 4 073660 P 28
FIRE
065087 P 23
FISSION PRODUCT, AIRBORNE
048324 P 18 060609 P 21 065092 P 23 066917 P 25
074335 P 29 082303 P 35
FOOD
005143 P 1 005148 P 2 005154 P 2 005170 P 2
005171 P 2 005381 P 3 008306 P 5 013618 P 7
035384 P 15 045385 P 18 048324 P 18 064274 P 22
072141 P 27 072249 P 28 074298 P 29 074531 P 29
074869 P 30 079183 P 33 081023 P 35
FOOD CHAIN
044009 P 17 045385 P 18 060609 P 21 065087 P 23
065092 P 23 065109 P 24 066917 P 25 079183 P 33
079392 P 33 083413 P 36
FOOD INTAKE
051297 P 18 056180 P 19 064785 P 22 064789 P 23
FRC
029905 P 13 030348 P 13 064274 P 22
FUEL REPROCESSING
027910 P 13 076433 P 31 080212 P 34
GAMMA
013618 P 7
GAMMA EMITTER
032538 P 14 064889 P 23 076433 P 31
GAS
031269 P 14 056741 P 20 058859 P 20 064889 P 23
070416 P 27 074865 P 30 079362 P 33 079785 P 34
080212 P 34 080822 P 34 082302 P 35 082303 P 35
GEOLOGY
007122 P 4 008175 P 5 034486 P 15 043090 P 16
GEOLOGY, GEOCHEMICAL
009511 P 5
GERMANY
013347 P 6 013795 P 9 092023 P 36
GLOVE BOX
007430 P 4
GROSS ALPHA
005143 P 1 005145 P 1 005148 P 2 005154 P 2
005170 P 2 005171 P 2 005183 P 3 005381 P 3
007898 P 5 008493 P 5 035384 P 15 074859 P 30
074865 P 30
GROSS BETA
005143 P 1 005145 P 1 005148 P 2 005154 P 2
005170 P 2 005171 P 2 005183 P 3 005381 P 3
007122 P 4 008175 P 5 008493 P 5 015959 P 10
030348 P 13 032834 P 14 035384 P 15 056741 P 20
062255 P 21 072249 P 28 074859 P 30 074865 P 30
078449 P 32
GROSS GAMMA
005148 P 2 005154 P 2 005170 P 2 005171 P 2
005183 P 3 005381 P 3 007082 P 4 008175 P 5
008493 P 5 009406 P 5 013775 P 7 013776 P 7
013777 P 7 013778 P 8 013779 P 8 013780 P 8
013781 P 8 013782 P 8 013783 P 9 013784 P 9
035384 P 15 056741 P 20 074859 P 30
GROUND WATER
007122 P 4 034486 P 15 043099 P 16 051305 P 18
053221 P 19 062255 P 21 079785 P 34 081445 P 35
082823 P 36
GROUND WATER, NUCLIDE OCCURRENCE
005171 P 2 007047 P 3 007122 P 4 008175 P 5
012287 P 6 013806 P 10 036421 P 15 042951 P 16
043090 P 16 055973 P 19 064274 P 22 068583 P 25
074589 P 30 075312 P 30 075733 P 31 075960 P 31
077945 P 32 079785 P 34 082823 P 36
GROUND WATER, PROPERTY
075733 P 31
GROUND WATER, TRACER
007122 P 4 075733 P 31
GUIDE
036604 P 15 043090 P 16 073928 P 28 074335 P 29
HANFORD SITE
036421 P 15 042951 P 16 062255 P 21 068583 P 25
074589 P 30 082823 P 36
HAZARDS ANALYSIS
007082 P 4 007430 P 4 027977 P 13
HEART
064785 P 22
HIGH
052994 P 18
HPIS
082302 P 35 082303 P 35
HUMIDITY, RELATIVE
075312 P 30
HYDRODYNAMIC ANALYSIS
007082 P 4
HYDROGEN
013799 P 10 028116 P 13
HYDROLOGY
007082 P 4 009511 P 5 012287 P 6 032537 P 14
043090 P 16 043099 P 16 044832 P 17 057383 P 20
074003 P 29
HYDROLOGY, RATE OF MOVEMENT
012287 P 6 015959 P 10 075733 P 31
IAEA
028116 P 13 070252 P 26 070255 P 26
IMMATURE
056180 P 19
INCINERATION
079362 P 33
INDIA
020442 P 11
INGESTION
015959 P 10 056180 P 19 064785 P 22 082303 P 35
INHALATION
009406 P 5 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9 027977 P 13
064785 P 22 073660 P 28 080822 P 34 082303 P 35
INORGANIC
070063 P 26
INSECT
077945 P 32
INSTRUMENT CALIBRATION
007430 P 4 009406 P 5 013775 P 7 013776 P 7
013777 P 7 013778 P 8 013779 P 8 013780 P 8
013781 P 8 013782 P 8 013783 P 9 013784 P 9
INSTRUMENT, AIR SAMPLING
094616 P 36
INSTRUMENT, COMPONENT
009406 P 5 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9
INSTRUMENTS, MISC.

007430 P 4 036537 P 15 077945 P 32
INTERNATIONAL
088469 P 36
IODINE
005143 P 1 005145 P 1 005148 P 2 005154 P 2
005170 P 2 005171 P 2 005183 P 3 005381 P 3
007430 P 4 008493 P 5 015959 P 10 032538 P 14
032834 P 14 035384 P 15 056741 P 20 072249 P 28
072581 P 28 074869 P 30 076433 P 31 077945 P 32
079183 P 33 081023 P 35
ION EXCHANGE
043099 P 16 075733 P 31
IRON
009406 P 5 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9 077945 P 32
ISOTOPIC FRACTIONATION
008175 P 5
ITALY
078012 P 32
KARLSRUHE
075312 P 30
KIDNEY
064785 P 22
KRYPTON
025597 P 12 031269 P 14 043102 P 17 056139 P 19
072581 P 28 074865 P 30 076433 P 31 077398 P 32
080822 P 34 081023 P 35 092023 P 36
LABORATORY EXPERIMENT
075362 P 31
LACROSSE (BWR)
082303 P 35
LAKE
033090 P 14 066272 P 24 069850 P 26 077945 P 32
LANTHANUM
008493 P 5
LASL
034486 P 15 074865 P 30 075960 P 31 081445 P 35
LEACHING
044009 P 17
LEAD
052994 P 18
LIQUID
064889 P 23 074865 P 30
LIVER
064785 P 22
LRL
022813 P 11 064274 P 22
MAMMAL
060609 P 21
MAN
005154 P 2 008306 P 5 022813 P 11 027977 P 13
045385 P 18 056180 P 19 064768 P 22 064785 P 22
066272 P 24 078017 P 32 079183 P 33
MANGANESE
005170 P 2 005381 P 3 009406 P 5 013775 P 7
013776 P 7 013777 P 7 013778 P 8 013779 P 8
013780 P 8 013781 P 8 013782 P 8 013783 P 9
013784 P 9 051297 P 18 069850 P 26 075362 P 31
MARINE ORGANISM
060609 P 21 065092 P 23 079392 P 33 083413 P 36
MATURE
064768 P 22
MEASUREMENT
034486 P 15 043102 P 17 043805 P 17 051441 P 18
053240 P 19 066047 P 24 070063 P 26 070255 P 26
074335 P 29 074531 P 29 074865 P 30 076433 P 31
078012 P 32 079785 P 34 081022 P 34
MERCURY
007430 P 4 031269 P 14
MESOSPHERE
025597 P 12
METEOROLOGICAL SUPPORT
007047 P 3
METEOROLOGY
078116 P 13 032537 P 14 036604 P 15 074865 P 30
077945 P 32
MILK
005143 P 1 005145 P 1 005148 P 2 005154 P 2
005170 P 2 005171 P 2 005183 P 3 005381 P 3
008493 P 5 013618 P 7 015959 P 10 032834 P 14
035384 P 15 048324 P 18 056741 P 20 064274 P 22
064768 P 22 064785 P 22 066047 P 24 067332 P 25
072249 P 28 073660 P 28 074335 P 29 074869 P 30
076433 P 31 078012 P 32 078449 P 32 079183 P 33
081023 P 35
MINERAL EXCHANGE
007082 P 4
MODEL TESTING
044832 P 17
MOLLUSC
065109 P 24
MONITOR
007430 P 4 034486 P 15 082225 P 35 082303 P 35
MONITOR, AIR
004695 P 1 005143 P 1 005145 P 1 005148 P 2
005154 P 2 005170 P 2 005171 P 2 005183 P 3
005381 P 3 007430 P 4 007898 P 5 008493 P 5
009406 P 5 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9 015767 P 10
016978 P 11 031269 P 14 065252 P 24 073004 P 28
080212 P 34
MONITOR, AREA
031269 P 14 034486 P 15 043090 P 16 062255 P 21
068583 P 25 072141 P 27 074589 P 30 074865 P 30
075960 P 31 076433 P 31 081445 P 35 082302 P 35
MONITOR, BACKGROUND
031269 P 14 044669 P 17 044832 P 17 056741 P 20
075732 P 31 076433 P 31 077398 P 32 078449 P 32
MONITOR, EMERGENCY
006924 P 3 070252 P 26 070255 P 26
MONITOR, ENVIRONMENTAL
006924 P 3 007462 P 4 025581 P 12 032537 P 14
034486 P 15 035384 P 15 036604 P 15 043099 P 16
044009 P 17 055973 P 19 056741 P 20 058859 P 20
061408 P 21 064210 P 22 064768 P 22 065109 P 24
065252 P 24 067941 P 25 070252 P 26 070255 P 26
070616 P 27 072141 P 27 073004 P 28 073660 P 28
074335 P 29 074531 P 29 074865 P 30 075960 P 31
077398 P 32 078449 P 32 081023 P 35 082302 P 35
082303 P 35
MONITOR, GAS
031269 P 14 065252 P 24 080212 P 34 082302 P 35
MONITOR, GENERAL PRACTICE
006924 P 3 074531 P 29
MONITOR, GROUND SURFACE
055973 P 19 072141 P 27 073004 P 28 075960 P 31
MONITOR, LIQUID
004695 P 1 004811 P 1 005143 P 1 005145 P 1
005148 P 2 005154 P 2 005170 P 2 005171 P 2
005183 P 3 005381 P 3 007122 P 4 031269 P 14
065252 P 24 068583 P 25 075312 P 30 077945 P 32
MONITOR, NUCLEAR DETONATION
064789 P 23 074003 P 29
MONITOR, PERSONNEL
006924 P 3
MONITOR, SAMPLING
072141 P 27 075312 P 30 080212 P 34 094616 P 36
MONITOR, SOLID
005143 P 1 005145 P 1 005148 P 2 005154 P 2
005170 P 2 005171 P 2 005183 P 3 005381 P 3
MONITOR, STACK
007430 P 4 007898 P 5 015767 P 10 065252 P 24
082302 P 35
MONITOR, TELEMETRY
072141 P 27
MONITORING PROGRAM, ENVIRONMENTAL
022001 P 11 022813 P 11 028116 P 13 039936 P 16
061936 P 21 066272 P 24 067332 P 25 077945 P 32
MONITORING SYSTEM, RADIATION
016929 P 10 027977 P 13 042951 P 16 073004 P 28
MOUND LABORATORY
005143 P 1 005183 P 3 007462 P 4 007898 P 5
013345 P 6 015767 P 10 016978 P 11 022001 P 11
022813 P 11 036604 P 15 061408 P 21 064210 P 22
072141 P 27 074531 P 29
MPBB
064768 P 22
MPC
007462 P 4 030348 P 13 036421 P 15
NEPTUNIUM
005170 P 2 015959 P 10 051297 P 18
NEUTRON
032538 P 14 069850 P 26
NEVADA TEST SITE
005170 P 2 070616 P 27 072249 P 28 075733 P 31
NEW ZEALAND
009511 P 5 051441 P 18 078012 P 32
NFS
076433 P 31
NIOBIUM
005145 P 1 008493 P 5 060609 P 21 079392 P 33
NITRATE
042951 P 16 062255 P 21
NOBLE GAS
077398 P 32
NRTS
005171 P 2 012287 P 6
NUCLEAR DETONATION
005143 P 1 005145 P 1 005154 P 2 005170 P 2
005171 P 2 005183 P 3 008175 P 5 031269 P 14

033090 P 14 070255 P 26 070416 P 27 072249 P 28
072581 P 28 073928 P 28 074003 P 29 074859 P 30
075312 P 30 079363 P 33 080822 P 34 082303 P 35
083413 P 36
OCEAN AND SEA
044832 P 17 051272 P 18 051441 P 18 070063 P 26
079363 P 33 079392 P 33
OCEAN, ATLANTIC
078012 P 32
OCEAN, PACIFIC
056543 P 20 064789 P 23 066917 P 25
OFF GAS
016929 P 10 092023 P 36
OFF SITE
036604 P 15 056741 P 20 058859 P 20 072249 P 28
079362 P 33 082303 P 35
OPERATING EXPERIENCE
064889 P 23
ORNL
007082 P 4
OXIDE
064768 P 22
OXYGEN
028116 P 13 065109 P 24 088469 P 36
PADUCAH PLANT
070616 P 27
PARTICLE
007898 P 5 015959 P 10 032834 P 14 035384 P 15
048324 P 18 056741 P 20 064889 P 23
PARTICLE SIZE
007082 P 4 009406 P 5 013775 P 7 013776 P 7
013777 P 7 013778 P 8 013779 P 8 013780 P 8
013781 P 8 013782 P 8 013783 P 9 013784 P 9
PARTICLE, RADIOACTIVE
070255 P 26
PERSONNEL EXPOSURE, RADIATION
007047 P 3 064768 P 22
PESTICIDE
069850 P 26
PHOSPHATE
077945 P 32
PHOSPHORUS
005154 P 2 015959 P 10
PHYSIOLOGY/METABOLISM
056180 P 19 064768 P 22 064785 P 22 064789 P 23
066272 P 24 069850 P 26
PHYTOPLANKTON
065109 P 24
PINELLAS PENINSULA
005171 P 2
PLANT
051297 P 18 051305 P 18 056139 P 19 082303 P 35
PLANT, ALGAE/FUNGI
060609 P 21 065109 P 24 066917 P 25 079392 P 33
PLANT, MOSS/FERN
060609 P 21 075362 P 31 079392 P 33
PLANT, SEEDLING
065087 P 23
PLANT, SPERMATOPHYTE
043102 P 17 060609 P 21 065109 P 24 079392 P 33
PLASTICS
066272 P 24
PLOWSHARE
008175 P 5 044832 P 17 053772 P 19 056139 P 19
058859 P 20 072581 P 28 074003 P 29 074859 P 30
079362 P 33 080822 P 34 082302 P 35
PLUTONIUM
004695 P 1 005145 P 1 005170 P 2 005183 P 3
007430 P 4 007462 P 4 008175 P 5 008493 P 5
009406 P 5 013345 P 6 013775 P 7 013776 P 7
013777 P 7 013778 P 8 013779 P 8 013780 P 8
013781 P 8 013782 P 8 013783 P 9 013784 P 9
015767 P 10 016978 P 11 022001 P 11 025581 P 12
034486 P 15 036604 P 15 061408 P 21 064210 P 22
066047 P 24 070616 P 27 072141 P 27 073660 P 28
074335 P 29 074531 P 29 074865 P 30 075960 P 31
079183 P 33 081023 P 35
POLONIUM
004695 P 1 005143 P 1 007462 P 4 007898 P 5
008175 P 5 013345 P 6 015767 P 10 016978 P 11
022001 P 11 025581 P 12 061408 P 21 064210 P 22
072141 P 27
POPULATION EXPOSURE
004695 P 1 007047 P 3 015959 P 10 061130 P 21
064768 P 22 064785 P 22 064789 P 23 066272 P 24
079183 P 33 080212 P 34 080822 P 34 081023 P 35
082303 P 35
PORTSMOUTH PLANT
005145 P 1
POTASSIUM
005154 P 2 005170 P 2 005171 P 2 083413 P 36
PRECIPITATION
020442 P 11 028116 P 13 032834 P 14 033090 P 14
035384 P 15 043102 P 17 043805 P 17 044669 P 17
048324 P 18 051272 P 18 051441 P 18 053740 P 19
054494 P 19 054496 P 19 064274 P 22 088469 P 36
PROMETHIUM
009406 P 5 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9
PROTACTINIUM
005145 P 1 008493 P 5
QUAD CITIES 1 (BWR)
077398 P 32
QUAD CITIES 2 (BWR)
077398 P 32
R AND D PROGRAM
092023 P 36
RADIATION DAMAGE
007047 P 3
RADIATION EFFECT
065087 P 23 074003 P 29
RADIATION EFFECT, ECOSYSTEM
064789 P 23
RADIATION EXPOSURE
074869 P 30 081023 P 35
RADIATION EXPOSURE, CHRONIC
066272 P 24
RADIATION MONITORS
004811 P 1 009406 P 5 013775 P 7 013776 P 7
013777 P 7 013778 P 8 013779 P 8 013780 P 8
013781 P 8 013782 P 8 013783 P 9 013784 P 9
032538 P 14 065252 P 24 066272 P 24 070252 P 26
077945 P 32 078449 P 32
RADIATION PROFILE
073004 P 28
RADIATION PROTECTION, ORGANIZATION
007047 P 3 029905 P 13
RADIATION SAFETY AND CONTROL
006924 P 3 007047 P 3 025581 P 12 027909 P 12
027977 P 13 032538 P 14 036537 P 15 036604 P 15
044009 P 17 066047 P 24 067332 P 25 070616 P 27
072141 P 27 073928 P 28 082225 P 35
RADIOACTIVITY RELEASE
025597 P 12 031259 P 14 064889 P 23 067941 P 25
070416 P 27 074859 P 30 079362 P 33 080212 P 34
082303 P 35
RADIOBIOLOGY
032537 P 14 036537 P 15
RADIOCHEMICAL ANALYSIS
008306 P 5 070063 P 26 070416 P 27 074859 P 30
075733 P 31 078012 P 32
RADIOISOTOPE
022001 P 11 051297 P 18 051305 P 18
RADIOLOGICAL ASSISTANCE
027909 P 12 027910 P 13 042951 P 16 064274 P 22
068583 P 25
RADIOLYTIC GAS
008175 P 5
RADIONUCLIDE TRANSFER
052994 P 18 066917 P 25 075312 P 30 075362 P 31
075733 P 31 077945 P 32
RADIONUCLIDE UPTAKE
056139 P 19 056180 P 19 060609 P 21 061130 P 21
064768 P 22 064785 P 22 064789 P 23 065087 P 23
065092 P 23 065109 P 24 066272 P 24 066917 P 25
069850 P 26 075312 P 30 075362 P 31 075733 P 31
077945 P 32 079392 P 33 083413 P 36
RADIUM
005148 P 2
RADON
009406 P 5 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9 036537 P 15
RAINOUT
005143 P 1 005145 P 1 005148 P 2 005154 P 2
005170 P 2 005171 P 2 005183 P 3 006794 P 3
009406 P 5 012287 P 6 013282 P 6 013775 P 7
013776 P 7 013777 P 7 013778 P 8 013779 P 8
013780 P 8 013781 P 8 013782 P 8 013783 P 9
013784 P 9 020442 P 11
RARE EARTH
015959 P 10
REACTOR
007430 P 4 056741 P 20
REACTOR POWER
032538 P 14
REACTOR, BWR
016929 P 10 032834 P 14 039936 P 16 067332 P 25
REACTOR, HWR
027977 P 13 044009 P 17
REACTOR, POWER

064889 P 23 077398 P 32 082303 P 35
REACTOR, PRODUCTION
005381 P 3
REACTOR, PWR
006794 P 3
REGULATION
044009 P 17 070616 P 27 074335 P 29
REGULATION, AEC
061408 P 21 064210 P 22 073928 P 28 074531 P 29
REPORT, OPERATIONS ANALYSIS
016929 P 10
RESEARCH, GOVERNMENT
065087 P 23
RESOURCE, NATURAL
080822 P 34 082303 P 35
REVIEW
051441 P 18
RHODAMINE B
007082 P 4
RHODIUM
025597 P 12 052994 P 18 074589 P 30
RIVER
004695 P 1 022001 P 11 029905 P 13 030348 P 13
032834 P 14 033090 P 14 036604 P 15 044009 P 17
051272 P 18 051297 P 18 051305 P 18 061408 P 21
064210 P 22 069850 P 26
RIVER, CLINCH
007082 P 4
RIVER, COLUMBIA
005170 P 2 015959 P 10 065087 P 23
RIVER, OTTAWA
069850 P 26
RIVER, SAVANNAH
005170 P 2 005381 P 3 013618 P 7
RIVER, TENNESSEE
007082 P 4
ROCKY FLATS
074869 P 30
ROVER PROGRAM
013345 P 6
RUTHENIUM
005145 P 1 005170 P 2 005381 P 3 007082 P 4
008493 P 5 036421 P 15 042951 P 16 051297 P 18
062255 P 21 068583 P 25 074589 P 30 082823 P 36
SAFETY EVALUATION
068583 P 25 082823 P 36
SAFETY PROGRAM
092023 P 36
SALINITY
065109 P 24
SAMPLING
007082 P 4 007430 P 4 007462 P 4 007898 P 5
008175 P 5 008306 P 5 009406 P 5 013345 P 6
013775 P 7 013776 P 7 013777 P 7 013778 P 8
013779 P 8 013780 P 8 013781 P 8 013782 P 8
013783 P 9 013784 P 9 013797 P 9 015767 P 10
015959 P 10 016978 P 11 025597 P 12 027909 P 12
027910 P 13 029905 P 13 030348 P 13 035384 P 15
036604 P 15 043102 P 17 044669 P 17 051272 P 18
052994 P 18 056543 P 20 058859 P 20 064210 P 22
065109 P 24 066047 P 24 067941 P 25 070255 P 26
070416 P 27 070616 P 27 072249 P 28 073004 P 29
073928 P 28 074003 P 29 074298 P 29 074335 P 29
074859 P 30 074869 P 30 075312 P 30 078449 P 32
079183 P 33 079392 P 33 079785 P 34 082302 P 35
SAMPLING, HIGH ALTITUDE
055973 P 19
SAVANNAH RIVER PLANT
005148 P 2 005170 P 2 005381 P 3 013618 P 7
023261 P 12 043090 P 16 051297 P 18 051305 P 18
064768 P 22 065252 P 24
SCANDIUM
069850 P 26
SEDIMENT
034486 P 15 065092 P 23 074865 P 30 075362 P 31
075733 P 31 075960 P 31 077945 P 32 083413 P 36
SEISMOLOGY
044832 P 17
SHIELDING
007430 P 4
SHIPPINGPORT (PWR)
005145 P 1 005154 P 2 006794 P 3
SILICON
032537 P 14
SITE CLIMATOLOGY
034486 P 15 074865 P 30
SITING
054494 P 19
SITING, REACTOR
065092 P 23
SODIUM
015959 P 10 025597 P 12
SOIL
034486 P 15 043099 P 16 053772 P 19 056139 P 19
058859 P 20 066047 P 24 072141 P 27 073660 P 28
074335 P 29 074531 P 29 074865 P 30 075960 P 31
081023 P 35
SOIL PROPERTY, IN SITU
065087 P 23 075733 P 31
SOIL, NUCLIDE OCCURRENCE
005171 P 2 005183 P 3 072581 P 28 077945 P 32
079363 P 33
SOIL, RADIONUCLIDE MOVEMENT THROUGH
042951 P 16 044832 P 17 068583 P 25 075733 P 31
SOLID
074865 P 30
SOLID STATE DEVICE
036537 P 15
SORPTION
027977 P 13 075733 P 31
SOURCE, RADIATION
082303 P 35
SOUTH AFRICA
013806 P 10 061130 P 21
SPECTROMETRY, ALPHA
070252 P 26
SPECTROMETRY, BETA
070252 P 26
SPECTROMETRY, GAMMA
007430 P 4 065092 P 23 065109 P 24 070255 P 26
074335 P 29 079392 P 33
STACK
016978 P 11 032537 P 14 056741 P 20 067941 P 25
080212 P 34
STATE PROGRAM
005171 P 2
STIMULATION
031269 P 14 070416 P 27 080822 P 34 082302 P 35
STRATOSPHERE
013282 P 6 025597 P 12 028116 P 13
STRONTIUM
004811 P 1 005143 P 1 005145 P 1 005148 P 2
005154 P 2 005170 P 2 005171 P 2 005183 P 3
005381 P 3 007082 P 4 008493 P 5 009406 P 5
013282 P 6 013618 P 7 013775 P 7 013776 P 7
013777 P 7 013778 P 8 013779 P 8 013780 P 8
013781 P 8 013782 P 8 013783 P 9 013784 P 9
015959 P 10 020442 P 11 022813 P 11 025597 P 12
030348 P 13 032834 P 14 035384 P 15 043090 P 16
043805 P 17 048324 P 18 051297 P 18 052994 P 18
056741 P 20 061130 P 21 062255 P 21 065109 P 24
066047 P 24 066272 P 24 067332 P 25 069850 P 26
070063 P 26 070616 P 27 074298 P 29 074865 P 30
074869 P 30 076433 P 31 077398 P 32 077945 P 32
078012 P 32 078449 P 32 079183 P 33 081023 P 35
083413 P 36
SURFACE WATER
034486 P 15 044832 P 17 081445 P 35
SURFACE WATER, DISPOSAL MEDIA
005143 P 1 005145 P 1 005148 P 2 005154 P 2
005170 P 2 005171 P 2 005183 P 3 005381 P 3
006794 P 3
SURFACE WATER, NUCLIDE OCCURRENCE
004695 P 1 004811 P 1 005143 P 1 005145 P 1
005148 P 2 005154 P 2 005170 P 2 005171 P 2
005183 P 3 005381 P 3 006794 P 3 007082 P 4
007462 P 4 007898 P 5 008493 P 5 012287 P 6
013345 P 6 013347 P 6 013618 P 7 013795 P 9
015767 P 10 015959 P 10 016978 P 11 027909 P 12
029905 P 13 030348 P 13 032834 P 14 033090 P 14
036604 P 15 039936 P 16 043099 P 16 048324 P 18
057383 P 20 060609 P 21 064274 P 22 065092 P 23
066917 P 25 069850 P 26 070063 P 26 072249 P 28
072581 P 28 075312 P 30 077945 P 32 078449 P 32
SURFACE WATER, SEDIMENT
005170 P 2 007082 P 4 065109 P 24
SURFACE WATER, SUSPENDED MATERIAL
004811 P 1 079392 P 33
SURVEILLANCE PROGRAM
016929 P 10 022813 P 11 027910 P 13 029905 P 13
030348 P 13 031269 P 14 032834 P 14 033090 P 14
035384 P 15 042951 P 16 043090 P 16 043099 P 16
043805 P 17 044669 P 17 044832 P 17 048324 P 18
055973 P 19 056543 P 20 058859 P 20 064274 P 22
065109 P 24 066047 P 24 068583 P 25 070616 P 27
072249 P 28 072581 P 28 074869 P 30 075733 P 31
075960 P 31 076433 P 31 077398 P 32 078012 P 32
079183 P 33 079362 P 33 081023 P 35
SURVEY
057383 P 20
SURVEY, ENVIRONMENT
004695 P 1 004811 P 1 005143 P 1 005145 P 1

005148 P 2 005154 P 2 005170 P 2 005171 P 2
005183 P 3 005381 P 3 006794 P 3 007047 P 3
007082 P 4 007462 P 4 007898 P 5 008306 P 5
008493 P 5 009406 P 5 013345 P 6 013618 P 7
013775 P 7 013776 P 7 013777 P 7 013778 P 8
013779 P 8 013780 P 8 013781 P 8 013782 P 8
013783 P 9 013784 P 9 015767 P 10 015959 P 10
016978 P 11 056139 P 19 064789 P 23 065109 P 24
067332 P 25 069850 P 26 077398 P 32 079362 P 33
088469 P 36

SURVEY, RADIATION
005171 P 2 032537 P 14 074298 P 29 075312 P 30
075960 P 31 077398 P 32 079362 P 33 081023 P 35
081445 P 35

SURVEY, USPHS
005143 P 1 005145 P 1 005148 P 2 005154 P 2
005170 P 2 005171 P 2 005183 P 3 032834 P 14
035384 P 15

TESTING
033090 P 14 064789 P 23 072581 P 28 073928 P 28
074003 P 29 074859 P 30 079362 P 33

TESTIS
061130 P 21

THALLIUM
008175 P 5

THERMAL CONSIDERATION
007082 P 4

THERMAL POLLUTION
065087 P 23

THORIUM
005145 P 1 005170 P 2 008175 P 5 008493 P 5
070063 P 26

TRACE ELEMENT
066272 P 24

TRACER, FLUORESCENT
007082 P 4

TRACER, RADIOACTIVE
043090 P 16 069850 P 26 077945 P 32

TRANSPORT
051297 P 18 051305 P 18 052994 P 18 053221 P 19
068583 P 25

TRANSPORT THEORY
044832 P 17

TROPOSPHERE
013797 P 9 025597 P 12

TUNGSTEN
025597 P 12 052994 P 18

TURNOVER RATE
043099 P 16

UNITED KINGDOM
006924 P 3 043805 P 17

UNITED STATES
027909 P 12 045385 P 18 055973 P 19 056180 P 19
057383 P 20 078012 P 32

URANIUM
005145 P 1 005170 P 2 007430 P 4 008175 P 5
008493 P 5 009406 P 5 013775 P 7 013776 P 7
013777 P 7 013778 P 8 013779 P 8 013780 P 8
013781 P 8 013782 P 8 013783 P 9 013784 P 9
032538 P 14 066047 P 24 070063 P 26 073660 P 28
074335 P 29

USSR
061936 P 21

VEGETATION
005148 P 2 005171 P 2 005381 P 3 007047 P 3
013618 P 7 058859 P 20 064785 P 22 066047 P 24
072249 P 28 074335 P 29

WASHOUT
033090 P 14

WASTE DISPOSAL
007122 P 4 007430 P 4 042951 P 16 051305 P 18
062255 P 21 065087 P 23 065092 P 23 074865 P 30
082225 P 35 082823 P 36

WASTE DISPOSAL, ATMOSPHERIC
004695 P 1 005143 P 1 005145 P 1 005148 P 2
005154 P 2 005170 P 2 005171 P 2 005183 P 3
005381 P 3 006794 P 3

WASTE DISPOSAL, LIQUID
012287 P 6 015959 P 10 032537 P 14 036421 P 15

WASTE DISPOSAL, OCEAN
065109 P 24

WASTE DISPOSAL, RIVER
004695 P 1 005143 P 1 005145 P 1 005148 P 2
005154 P 2 005170 P 2 005171 P 2 005183 P 3
005381 P 3 006794 P 3 075362 P 31

WASTE DISPOSAL, TERRESTRIAL
012287 P 6 015959 P 10 043090 P 16 044009 P 17

WASTE MANAGEMENT
007047 P 3 035384 P 15

WASTE TREATMENT
056741 P 20 066272 P 24

WATER
022001 P 11 022813 P 11 028116 P 13 035384 P 15
048324 P 18 051272 P 18 051441 P 18 053240 P 19
058859 P 20 061936 P 21 064274 P 22 064768 P 22
066047 P 24 072141 P 27 073660 P 28 073928 P 28
074335 P 29 074531 P 29 074859 P 30 074869 P 30
076433 P 31 078012 P 32 079785 P 34 081023 P 35
082302 P 35

WATER POLLUTION
029905 P 13 030348 P 13 064210 P 22 077945 P 32
079183 P 33 079363 P 33

WATER VAPOR
080212 P 34

WATER, DRINKING
005148 P 2 005171 P 2 005183 P 3 006794 P 3
015959 P 10 029905 P 13 030348 P 13 032834 P 14
048324 P 18 062255 P 21 064785 P 22 072249 P 28
078449 P 32 079183 P 33 081022 P 34

X-RAY
007430 P 4 032538 P 14

XENON
005145 P 1 005154 P 2 066272 P 24 077398 P 32
081023 P 35 092023 P 36

YEAR
064789 P 23

YTTRIUM
009406 P 5 013775 P 7 013776 P 7 013777 P 7
013778 P 8 013779 P 8 013780 P 8 013781 P 8
013782 P 8 013783 P 9 013784 P 9

ZINC
015959 P 10 065087 P 23

ZION 1 (PWR)
077398 P 32

ZION 2 (PWR)
077398 P 32

ZIRCONIUM
005143 P 1 005145 P 1 005148 P 2 005170 P 2
005183 P 3 005381 P 3 008493 P 5 009406 P 5
013775 P 7 013776 P 7 013777 P 7 013778 P 8
013779 P 8 013780 P 8 013781 P 8 013782 P 8
013783 P 9 013784 P 9 051297 P 18 060609 P 21
079392 P 33

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

ADAMS PC
004695 P 1 007462 P 4 007898 P 5 013345 P
ALBENESIUS EL
064768 P 22
ANDERSON HF
013345 P 6 015767 P 10 016978 P 11 022001 P
025581 P 12 036604 P 15
ANDERSON K
033090 P 14
ANDERSON KO
076433 P 31
ANSPAUGH LR
070255 P 26 073660 P 28
ASHLEY C
051297 P 18
ATHAVALE RN
020442 P 11
BALLANCE WC
074859 P 30
BARTON CJ
080822 P 34
BASSON JK
061130 P 21
BLOCK S
007430 P 4
BOGEN DC
070252 P 26
BOLCH WE
065092 P 23 065109 P 24
BREWER PG
070063 P 26
BROOKS WL
043805 P 17
BROWN DJ
007122 P 4
BROWN RM
054494 P 19
BUTTLAR HV
013347 P 6 013795 P 9
CAMBRAY PS
043805 P 17
CAMERON JF
013282 P 6 028116 P 13
CANTILLON G
075362 P 31
CARFAGNO DG
072141 P 27 074531 P 29
CARTER MW
074298 P 29
CASTAGNOLA DC
072581 P 28 073928 P 28
CASTAGNOLA EJ
074003 P 29
CLAASSEN HC
070416 P 27
COCHRAN JA
080212 P 34
COOLEY RC
027977 P 13
COWPER G
077945 P 32
DALY JC
027910 P 13
DENHAM DH
036421 P 15 042951 P 16
DEVIRTS AL
061936 P 21
DOBKINA EI
061936 P 21
DROBINSKI JC
008306 P 5 064785 P 22
ECKERT JA
081022 P 34
EMMERSON B
006924 P 3
ESSIG TH
015959 P 10 062255 P 21 068583 P 25
ESSINGTON FH
044832 P 17 074003 P 29 075733 P 31 079363 P
EVANS AG
023261 P 12
EVANS RB
081022 P 34
FARNSWORTH RK
057383 P 20
FARZINE K
013795 P 9
FENSKE PR
044832 P 17
FERGUSSON GJ
013797 P 9
FISHER EM
043805 P 17
FLORKOWSKI T
028116 P 13
FORSLOW EJ
075733 P 31
FRIEDMAN I
013799 P 10
GABAY JJ
027910 P 13
GATROUSIS C
073660 P 28
GILMARTIN JT
056741 P 20
GOLD S
082303 P 35
GOLDIN AS
008306 P 5 064785 P 22
GONSIOR B
013799 P 10
GOTCHY RL
031269 P 14
GRIFFIN WR
080212 P 34
GROSSMAN RF
079362 P 33
GUDIKSEN PH
066047 P 24 067941 P 25 073660 P 28 074335 P 2
HAMBY KO
074335 P 29
HANNA SR
080822 P 34
HARDY EP
078012 P 32
HAWKINS DB
012287 P 6
HAZLETON-NUCLEAR S
053221 P 19
HELD EF
066917 P 25 079392 P 33 083413 P 36
HERCEG JE
034486 P 15 075960 P 31
HERCOG JE
074865 P 30
HOLLADAY G
070255 P 26
HOLLAND JZ
075597 P 12
HULL AP
056741 P 20
IAEA
051272 P 18
KAHN B
082303 P 35
KATHREN RL
007430 P 4
KAWASAKI H
079785 P 34
KIGOSHI K
043102 P 17
KINDEKEN CL
007430 P 4
KIPP KL
074589 P 30 082823 P 36
KIRCHMANN R
075362 P 31
KOENIG LA
075312 P 30
KORANDA JJ
053772 P 19 064789 P 23 070255 P 26
KRIEGER HL
082303 P 35
KUSIAN R
007430 P 4
LAGATTA DP
008306 P 5 064785 P 22
LAL D
020442 P 11
LIEBERMAN R

074298 P 29
LINDEKEN CL
073660 P 28
LINDENMAYR G
013799 P 10
LYON RJ
045385 P 18 056180 P 19
MANCHESTER AV
027910 P 13
MARTER WL
065252 P 24
MAWSON CA
069850 P 26 077945 P 32
MEADOWS JW
074335 P 29
MEYER HE
004695 P 1
MOGHISSI AA
027909 P 12 044669 P 17 045385 P 18 074298 P
MOGHISSIOAA
056180 P 19
MOORE RE
080822 P 34
MORTON RJ
007082 P 4
MULLINS JW
055973 P 19
MYERS DS
067941 P 25
NATHANS MW
008175 P 5
NELSON VA
083413 P 36
NORK WF
044832 P 17 075733 P 31
OCHIAI T
079785 P 34
ODEN S
043099 P 16
OESTLUND HG
073004 P 28
OSBORNE RV
082302 P 35
OSTLUND HG
094616 P 36
PATTERSON CM
065252 P 24
PAYNE BR
013282 P 6 028116 P 13
PAYNE DW
079362 P 33
PHELPS PL
070255 P 26
PIERSON DH
043805 P 17
PORTER CR
027909 P 12 044669 P 17
PORTER NS
036537 P 15
RAFTER TA
009511 P 5
RAHA
020442 P 11
REICHERT SO
043090 P 16 051305 P 18
REINING WC
064768 P 22
SAX NI
027910 P 13
SCHELL WR
083413 P 36
SCHIMMELFENNIG V
007430 P 4
SCHMALZ BL
012287 P 6
SCHRODER LJ
074859 P 30
SELLSCHOP JP
013806 P 10
SHEEHAN WE
015767 P 10 016978 P 11 022001 P 11 025581 P 1
036604 P 15
SHMUKLARSKY MJ
077398 P 32
SOLDAT JK
015959 P 10
SPEAR WG
036537 P 15
SPENCER DW
070063 P 26
STEBBINS AK
052994 P 18
STEIN JL
055973 P 19
STEWART GL
057383 P 20
SUESS HE
056543 P 20
TAKAHASHI T
053240 P 19
TAYLOR CB
051441 P 18 054496 P 19
TERRILL JG
008306 P 5 064785 P 22
THATCHER LL
013282 P 6 028116 P 13
TINNEY JF
067941 P 25
TROIANELLO EJ
080212 P 34
VANAS D
061130 P 21
VANDERWESTHUSIZEN
061130 P 21
VAUGHAN BE
065087 P 23
VERHAGEN BT
013806 P 10
VINOGRADOV AP
061936 P 21
VLEGGAAR CM
061130 P 21
WATSON GM
044009 P 17
WELFORD GA
070252 P 26
WESTENDORF WH
072141 P 27 074531 P 29
WINTER M
075312 P 30
WOHLFAHRT D
013795 P 9
WYERMAN TA
057383 P 20
IKWO
083413 P 36

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN THE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE. * INDICATES END OF TITLE.)

1970* #INTERIM SUMMARY OF TRITIUM DATA FOR STS	'A,' AMCHITKA ISLAND, ALASKA JULY 1, 1969 THRU JUNE 30,	074003 P 29
30, 1971* #AN INTERIM SUMMARY OF TRITIUM DATA FOR STS	'A', AMCHITKA ISLAND, ALASKA, JULY 1, 1970 THROUGH JUNE	079363 P 33
#THE ENVIRONMENTAL MONITORING PROGRAMME AT THE	A.A.E.C. RESEARCH ESTABLISHMENT, LUCAS HEIGHTS*	044009 P 17
* #INTERIM SUMMARY OF TRITIUM DATA FOR STS '	A.' AMCHITKA ISLAND, ALASKA JULY 1, 1969 THRU JUNE 30, 1970	074003 P 29
1971* #AN INTERIM SUMMARY OF TRITIUM DATA FOR STS '	A', AMCHITKA ISLAND, ALASKA, JULY 1, 1970 THROUGH JUNE 30,	079363 P 33
PHYSICS AND MEDICINE*	# ACTIVITIES OF AECL IN THE FIELDS OF BIOLOGY, HEALTH	007047 P 3
GLOBAL FALLOUT OF H-3 AND SR-90* #MEASUREMENT OF TRITIUM	ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF	020442 P 11
#ACTIVITIES OF	AECL IN THE FIELDS OF BIOLOGY, HEALTH PHYSICS AND MEDICINE*	007047 P 3
#RADIOACTIVE FALLOUT OVER SOUTH	AFRICA AND ITS BIOLOGICAL UPTAKE*	061130 P 21
#TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH	AFRICAN SITES*	013806 P 10
1972* #RADIOCHEMICAL MONITORING OF WATER	AFTER THE CANNIKEN EVENT, AMCHITKA ISLAND, ALASKA, JULY	074859 P 30
STREAMS AND PRECIPITATION COLLECTED IMMEDIATELY BEFORE AND	AFTER THE SECOND PRODUCTION-TEST FLARING, PROJECT RULISON*	070416 P 27
#RADIATION DATA, MILK AND FOOD, WATER,	AIR AND DEPOSITION, AND OTHER DATA*	081023 P 35
#SURVEILLANCE DATA FOR MILK AND FOOD, WATER,	AIR AND DEPOSITION, AND OTHER DATA*	064274 P 22
#RADIOACTIVE FALLOUT IN	AIR AND RAIN - RESULTS TO THE MIDDLE OF 1969*	043805 P 17
REPROCESSING PLANT* #OBSERVATION OF	AIRBORNE TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL	080212 P 34
SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS	ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969*	081445 P 35
#ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS	ALAMOS SCIENTIFIC LABORATORY*	074865 P 30
#ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS	ALAMOS SCIENTIFIC LABORATORY, JANUARY THROUGH JUNE 1971*	034486 P 15
#ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS	ALAMOS SCIENTIFIC LABORATORY, JULY THROUGH DECEMBER 1971*	075960 P 31
SUMMARY OF TRITIUM DATA FOR STS 'A,' AMCHITKA ISLAND,	ALASKA JULY 1, 1969 THRU JUNE 30, 1970* #INTERIM	074003 P 29
#TRITIUM ANOMALIES ON AMCHITKA ISLAND,	ALASKA. PART I*	073928 P 28
#TRITIUM ANOMALIES ON AMCHITKA ISLAND,	ALASKA. PART II*	072581 P 28
SUMMARY OF TRITIUM DATA FOR STS 'A', AMCHITKA ISLAND,	ALASKA, JULY 1, 1970 THROUGH JUNE 30, 1971* #AN INTERIM	079363 P 33
OF WATER AFTER THE CANNIKEN EVENT, AMCHITKA ISLAND,	ALASKA, JULY 1972* #RADIOCHEMICAL MONITORING	074859 P 30
OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL BETA AND	ALPHA ASSAY* #APPLICATION	070252 P 26
#HASP. SECOND SPECIAL REPORT ON HIGH	ALTITUDE SAMPLING PROGRAM.*	052994 P 18
#INTERIM SUMMARY OF TRITIUM DATA FOR STS 'A,'	AMCHITKA ISLAND, ALASKA JULY 1, 1969 THRU JUNE 30, 1970*	074003 P 29
#TRITIUM ANOMALIES ON	AMCHITKA ISLAND, ALASKA. PART I*	073928 P 28
#TRITIUM ANOMALIES ON	AMCHITKA ISLAND, ALASKA. PART II*	072581 P 28
* #AN INTERIM SUMMARY OF TRITIUM DATA FOR STS 'A',	AMCHITKA ISLAND, ALASKA, JULY 1, 1970 THROUGH JUNE 30, 1971	079363 P 33
RADIOCHEMICAL MONITORING OF WATER AFTER THE CANNIKEN EVENT,	AMCHITKA ISLAND, ALASKA, JULY 1972* #	074859 P 30
1972 TO DECEMBER 1972* #	AMCHITKA RADIOBIOLOGICAL PROGRAM PROGRESS REPORT FOR MARCH	083413 P 36
1970 TO APRIL 1971* #	AMCHITKA RADIOBIOLOGICAL PROGRAM PROGRESS REPORT, JULY	066917 P 25
TO FEBRUARY 1972* #	AMCHITKA RADIOBIOLOGICAL PROGRAM PROGRESS REPORT, MAY 1971	079392 P 33
* #	ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM	066785 P 22
* #	ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM	008306 P 5
COLLECTED IMMEDIATELY BEFORE AND AFTER THE #RADIOCHEMICAL	ANALYSIS OF WATER FROM SELECTED STREAMS AND PRECIPITATION	070416 P 27
PROGRAM OF THE INSTITUTIONAL TOTAL DIET SAMPLING NETWORK: I	ANALYTICAL DATA RELATED TO SAMPLES COLLECTED DURING 1966-	076298 P 29
#	ANALYTICAL METHODS IN OCEANOGRAPHY - I. INORGANIC METHODS*	070063 P 26
RADIOACTIVITY* #SAMPLING AND	ANALYTICAL SYSTEMS FOR MEASURING ENVIRONMENTAL	070255 P 27
#TRITIUM	ANOMALIES ON AMCHITKA ISLAND, ALASKA. PART I*	073928 P 28
#TRITIUM	ANOMALIES ON AMCHITKA ISLAND, ALASKA. PART II*	072581 P 28
BETA AND ALPHA ASSAY* #	APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL	070252 P 26
OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND ITS	APPLICATION TO METEOROLOGY AND HYDROLOGY. FINAL REPORT*	028116 P 13
OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA, WITH	APPLICATIONS IN SOIL SCIENCE AND HYDROLOGY* #THE	043099 P 16
#AN ECOLOGICAL	APPROACH TO ENVIRONMENTAL SURVEILLANCE*	065109 P 24
#AN ECOLOGICAL	APPROACH*	060609 P 21
#TRITIUM BURDENS IN TWO	ARCTIC VILLAGES*	081022 P 34
#RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST	AREA*	075733 P 31
OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS	AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969* SURVEY	081445 P 35
#ENVIRONMENTAL RADIOACTIVITY AT	ARGONNE NATIONAL LABORATORY*	008493 P 5
UPPER ATMOSPHERE* #PROBLEMS	ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE	025397 P 12
#CONTROLLING TRITIUM HAZARDS	AROUND HEAVY WATER MODERATED REACTORS*	027977 P 13
#HEALTH PHYSICS	ASPECTS OF LRL TRITIUM RELEASE*	067941 P 25
LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL BETA AND ALPHA	ASSAY* #APPLICATION OF	070252 P 26
NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE	ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS*AT BROOKHAVEN	064889 P 23
#TRITIATED MOISTURE IN THE	ATMOSPHERE SURROUNDING A NUCLEAR FUEL REPROCESSING PLANT*	027910 P 13
IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER	ATMOSPHERE* #PROBLEMS ARISING	025397 P 12
#A SAMPLING SYSTEM FOR	ATMOSPHERIC HT AND HTO*	094616 P 36
#NEW TRITIUM AND DEUTERIUM MEASUREMENTS IN	ATMOSPHERIC HYDROGEN*	013799 P 10
PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972*#	ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH	077945 P 32
LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, #	ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR	066272 P 24
CALENDAR #ENVIRONMENTAL RADIOACTIVITY AT THE SHIPPINGPORT	ATOMIC POWER STATION FOR THE SECOND HALF OF 1963 AND FOR	006794 P 3
RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN	BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL	064889 P 23
SELECTED STREAMS AND PRECIPITATION COLLECTED IMMEDIATELY	BEFORE AND AFTER THE SECOND PRODUCTION-TEST FLARING,	070416 P 27
EFFLUENTS FROM PWR NUCLEAR POWER PLANTS* #	BEHAVIOR IN RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN	075362 P 31
#RADIOLOGICAL STATUS OF THE GROUNDWATER	BENEATH THE HANFORD PROJECT - JANUARY-JUNE 1972*	082823 P 36
#RADIOLOGICAL STATUS OF THE GROUND WATER	BENEATH THE HANFORD PROJECT, JAN.-JUNE 1969*	062951 P 16
#RADIOLOGICAL STATUS OF THE GROUNDWATER	BENEATH THE HANFORD PROJECT, JANUARY-JUNE 1970*	062255 P 21
#RADIOLOGICAL STATUS OF THE GROUNDWATER	BENEATH THE HANFORD PROJECT, JULY-DEC., 1971*	074589 P 30
#RADIOLOGICAL STATUS OF THE GROUND WATER	BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1968*	036421 P 15
#RADIOLOGICAL STATUS OF THE GROUNDWATER	BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1970*	068583 P 25
#APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL	BETA AND ALPHA ASSAY*	070252 P 26
#MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED	BIBLIOGRAPHY*	082225 P 35

#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 21
LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL 069850 P 26
1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 077945 P 32
ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 066272 P 24
LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. 036537 P 15
#ACTIVITIES OF AECL IN THE FIELDS OF BIOLOGY, HEALTH PHYSICS AND MEDICINE* 007047 P 3
WATER OF THE PACIFIC OCEAN.* #MEASUREMENTS OF BOMB PRODUCED RADIOCARBONS IN THE SURFACE AND SUBSURFACE 056543 P 20
AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (P. 29-41)* JULY 1 TO SEPT. 30, 1971 - BIOLOGY 069850 P 26
#ENVIRONMENTAL RESEARCH BRANCH PROGRESS REPORT, JULY 1 TO SEPTEMBER 30, 1968* 032537 P 14
#HEALTH PHYSICS BRANCH PROGRESS REPORT, JULY 1 TO SEPTEMBER 30, 1968* 032538 P 14
AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH 064889 P 23
#1966 ENVIRONMENTAL MONITORING RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY* 056741 P 20
#TRITIUM BURDENS IN TWO ARCTIC VILLAGES* 081022 P 34

IN SOIL SCIENCE AND HYDROLOGY* #THE OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA, WITH APPLICATIONS 043099 P 16
#PRELIM STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC PROVING GROUND* 064789 P 23
ATOMIC POWER STATION FOR THE SECOND HALF OF 1963 AND FOR CALENDAR YEAR 1963* RADIOACTIVITY AT THE SHIPPINGPORT 006794 P 3
#ANNUAL ENVIRONMENTAL MONITORING REPORT: CALENDAR YEAR 1972* 074531 P 29
PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972*#ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION 077945 P 32
AND HEALTH PHYSICS DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY 066272 P 24
#TRITIUM IN PRECIPITATION AT CANADIAN SITES (1953-1963).* 054494 P 19
#RADIOCHEMICAL MONITORING OF WATER AFTER THE CANNIKEN EVENT, AMCHITKA ISLAND, ALASKA, JULY 1972* 074859 P 30
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 064785 P 22
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 008306 P 5
#NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* 043102 P 17
#RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA* 075733 P 31
TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - # CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 069850 P 26
PHYSICS DIVISION. #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH 066272 P 24
NATIONAL #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN 064889 P 23
MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* # 020442 P 11
INVESTIGATIONS JANUARY-DECEMBER, 1964* # CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL 007122 P 4
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 023261 P 12
#MEASUREMENT OF TRITIUM IN RAIN, CITY WATER, GROUND WATER AND HOT SPRINGS.* 053240 P 19
#STATUS REPORT NO. 5 ON CLINCH RIVER STUDY* 007082 P 4
DIET SAMPLING NETWORK: I ANALYTICAL DATA RELATED TO SAMPLES COLLECTED DURING 1966-1968* OF THE INSTITUTIONAL TOTAL 074298 P 29
ANALYSIS OF WATER FROM SELECTED STREAMS AND PRECIPITATION COLLECTED IMMEDIATELY BEFORE AND AFTER THE SECOND 070416 P 27
RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER 064889 P 23
#STUDY OF TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT* 073004 P 28
#ENVIRONMENTAL ISOTOPE DATA NO. 4: WORLD SURVEY OF ISOTOPE CONCENTRATION IN PRECIPITATION (1968T1969)* 088469 P 36
#TRITIUM CONCENTRATION IN PRECIPITATION, 1967-1968* 044669 P 17
LIST NO. 1* #TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. 051272 P 18
PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE 013795 P 9
PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE 013347 P 6
RECENT YEARS* #NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN 043102 P 17
#TRITIUM CONCENTRATIONS IN FOOD, 1967-1968* 045385 P 18
#TRITIUM CONCENTRATIONS IN FOOD, 1967-1968* 056180 P 19
#EVALUATION OF RADIOLOGICAL CONDITIONS IN THE VICINITY OF HANFORD FOR 1965* 015959 P 10
#FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2* 004811 P 1
#TRITIUM CONTAMINATION OF THE ENVIRONMENT* 075312 P 30
#PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE* 025597 P 12
#THE CURRENT TRITIUM CONTENTS OF NATURAL WATERS* 061936 P 21
PLANT* # CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER 064768 P 22
#INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 19* 007430 P 4
#MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY* 082225 P 35
REACTORS* # CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED 027977 P 13
OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL- COUNTING TECHNIQUE* #TRITIUM CONCENTRATION 013795 P 9
OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL- COUNTING TECHNIQUE* #TRITIUM CONCENTRATION 013347 P 6
#ENVIRONMENTAL MONITORING REPORT: PERIOD COVERING MAY 1, 1972 - JULY 31, 1972* 078449 P 32
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 19
#ENVIRONMENTAL SURVEILLANCE OF THE CRYSTAL RIVER NUCLEAR POWER PLANT* 065092 P 23
#THE CURRENT TRITIUM CONTENTS OF NATURAL WATERS* 061936 P 21

DATA - SECTION IV. OTHER DATA* 022813 P 11
OTHER DATA* #SURVEILLANCE DATA FOR MILK AND FOOD, WATER, AIR AND DEPOSITION, AND 064274 P 27
THRU JUNE 30, 1970* #INTERIM SUMMARY OF TRITIUM DATA FOR STS 'A,' AMCHITKA ISLAND, ALASKA JULY 1, 1969 074003 P 29
THROUGH JUNE 30, 1971* #AN INTERIM SUMMARY OF TRITIUM DATA FOR STS 'A', AMCHITKA ISLAND, ALASKA, JULY 1, 1970 079363 P 33
PRECIPITATION (1968T1969)* #ENVIRONMENTAL ISOTOPE DATA NO. 4: WORLD SURVEY OF ISOTOPE CONCENTRATION IN 088469 P 36
THE INSTITUTIONAL TOTAL DIET SAMPLING NETWORK: I ANALYTICAL DATA RELATED TO SAMPLES COLLECTED DURING 1966-1968* OF 074298 P 29
#SECTION II - WATER - RADIOLOGICAL HEALTH DATA REPORTS* 029905 P 13
#DATA - SECTION IV. OTHER DATA* 022813 P 11
#RADIOLOGICAL HEALTH DATA* 035384 P 15
#ELK RIVER REACTOR SYSTEM MONITORING DATA* 016929 P 10
#RADIOLOGICAL HEALTH DATA* 048324 P 18
#ENVIRONMENTAL MONITORING DATA* 082303 P 35
#RADIATION DATA* 074869 P 30
#RADIATION DATA* 079183 P 33
#RADIATION DATA* 072249 P 28
#RADIATION DATA* 070616 P 27
DATA, MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA* #RADIATION 081023 P 35
FOR MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA* #SURVEILLANCE DATA 064274 P 22
DATA* #RADIATION DATA, MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER 081023 P 35
#RADIOLOGICAL HEALTH DATA, VOLUME IV, NUMBER 3* 005143 P 1

#RADIOLOGICAL HEALTH DATA, VOLUME IV, NUMBER 5* 005145 P 1
#RADIOLOGICAL HEALTH DATA, VOLUME IV, NUMBER 8* 005148 P 2
#RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 3* 005154 P 2
#RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 4* 005183 P 3
#RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 8* 005170 P 2
#RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 9* 005171 P 2
AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968- DEC. 1969* #EVALUATION OF TRITIUM IN GROUND 055973 P 19
STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY- DEC., 1971* #RADIOLOGICAL 074589 P 30
#ENVIRONMENTAL MONITORING REPORT- JULY - DECEMBER, 1964 AND 1964 SUMMARY* 007462 P 4
EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY- DECEMBER, 1964* #CHEMICAL 007122 P 4
OF THE LAWRENCE LIVERMORE LABORATORY, JANUARY THROUGH DECEMBER, 1971* LEVELS OF RADIOACTIVITY IN THE VICINITY 073660 P 28
#SURVEILLANCE DATA FOR MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA* 064274 P 22
#RADIATION DATA, MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA* 081023 P 35
#NEW TRITIUM AND DEUTERIUM MEASUREMENTS IN ATMOSPHERIC HYDROGEN* 013799 P 10
SAMPLES #RADIOBIOASSAY PROGRAM OF THE INSTITUTIONAL TOTAL DIET SAMPLING NETWORK: I ANALYTICAL DATA RELATED TO 074298 P 29
#OBSERVATION OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING PLANT* 080212 P 34
IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES.* #RADIONUCLIDES 051305 P 18
IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* #RADIONUCLIDES 043098 P 16
#CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY-DECEMBER, 1964* 007122 P 4
#MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY* 082225 P 35
#TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 6
JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (P. 29-41)* 069850 P 26
NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL 036537 P 15
ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972* # 077945 P 32
RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*LIMITED, CHALK 066272 P 24
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 023261 P 12
#RADIATION DOSES FROM HYPOTHETICAL EXPOSURES TO RULISON GAS* 080822 P 34
NETWORK: I ANALYTICAL DATA RELATED TO SAMPLES COLLECTED DURING 1966-1968* OF THE INSTITUTIONAL TOTAL DIET SAMPLING 074298 P 29

#PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES* 065087 P 23
#AN ECOLOGICAL APPROACH TO ENVIRONMENTAL SURVEILLANCE* 065109 P 24
#AN ECOLOGICAL APPROACH* 060609 P 21
RADIOACTIVITY. SEMIANNUAL REPORT JULY THROUGH DECEMBER # EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL 051297 P 18
RADIOACTIVITY. SEMIANNUAL REPORT JANUARY THROUGH JUNE 1966*# EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL 013618 P 7
RADIOACTIVITY* # EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL 005381 P 3
RADIATION LEVELS AT BROOKHAVEN #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND 064889 P 23
#BEHAVIOR IN RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR POWER PLANTS* 075362 P 31
DECEMBER, 1964* #CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY- 007122 P 4
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 19
#SURVEY OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER FOR JANUARY THROUGH JUNE 1969* 039936 P 16
ELK RIVER REACTOR SYSTEM MONITORING DATA* 016929 P 10
#SURVEY OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER* 067332 P 25
DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH PHYSICS 077945 P 32
LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR 066272 P 24
OFF-SITE RADIOLOGICAL SAFETY PROGRAM FOR PROJECT RULISON RE- ENTRY PORTION OF PHASE III* # 079362 P 33
#TRITIUM CONTAMINATION OF THE ENVIRONMENT* 075312 P 30
#STUDY OF TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT* 073004 P 28
#MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT* 065252 P 24
CONCENTRATION IN PRECIPITATION (1968T1969)* # ENVIRONMENTAL ISOTOPE DATA NO. 4: WORLD SURVEY OF ISOTOPE 088469 P 36
THE LAWRENCE LIVERMORE LABORATORY - 1972 ANNUAL REPORT* # ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE VICINITY OF 074335 P 29
THE LAWRENCE LIVERMORE LABORATORY - #SEMIANNUAL REPORT OF # ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE VICINITY OF 066047 P 24
THE LAWRENCE LIVERMORE LABORATORY, JANUARY THROUGH # ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE VICINITY OF 073660 P 28
ENVIRONMENTAL MONITORING DATA* 082303 P 35
POWER STATION* # ENVIRONMENTAL MONITORING IN THE OPERATION OF A NUCLEAR 006924 P 3
SCIENTIFIC LABORATORY, JANUARY THROUGH JUNE 1971* # ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS 036486 P 15
SCIENTIFIC LABORATORY, JULY THROUGH DECEMBER 1971* # ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS 075960 P 31
SCIENTIFIC LABORATORY* # ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS 074865 P 30
RESEARCH ESTABLISHMENT, LUCAS HEIGHTS* #THE ENVIRONMENTAL MONITORING PROGRAMME AT THE A.A.E.C. 044009 P 17
NATIONAL LABORATORY* #1966 ENVIRONMENTAL MONITORING RADIATION LEVELS AT BROOKHAVEN 056741 P 20
ENVIRONMENTAL MONITORING REPORT - JANUARY-JUNE 1969* 036604 P 15
ENVIRONMENTAL MONITORING REPORT - JANUARY-JUNE 1970* 061408 P 21
SUMMARY* # ENVIRONMENTAL MONITORING REPORT - JULY 1967 AND 1967 025581 P 12
1970 SUMMARY* # ENVIRONMENTAL MONITORING REPORT - JULY-DECEMBER 1970 AND 064210 P 22
1971 SUMMARY* # ENVIRONMENTAL MONITORING REPORT - JULY-DECEMBER 1971 AND 072141 P 27
ENVIRONMENTAL MONITORING REPORT. JANUARY-JUNE 1967* 022001 P 11
1965 SUMMARY* # ENVIRONMENTAL MONITORING REPORT. JULY-DECEMBER 1965 AND 013345 P 6
1966 SUMMARY* # ENVIRONMENTAL MONITORING REPORT. JULY-DECEMBER 1966 AND 016978 P 11
ENVIRONMENTAL MONITORING REPORT- JANUARY-JUNE 1965* 007898 P 5
ENVIRONMENTAL MONITORING REPORT- JANUARY-JUNE 1966* 015767 P 10
1964 SUMMARY* # ENVIRONMENTAL MONITORING REPORT- JULY - DECEMBER, 1964 AND 007462 P 4
#ANNUAL ENVIRONMENTAL MONITORING REPORT: CALENDAR YEAR 1972* 074531 P 29
1972 - JULY 31, 1972* # ENVIRONMENTAL MONITORING REPORT: PERIOD COVERING MAY 1, 078449 P 32
THROUGH JUNE, 1964* # ENVIRONMENTAL MONITORING SEMI-ANNUAL REPORT- JANUARY 004695 P 1
ENVIRONMENTAL MONITORING TECHNIQUES* 082302 P 35
ENVIRONMENTAL RADIOACTIVITY AT ARGONNE NATIONAL LABORATORY* 008493 P 5
THROUGH JUNE 1969* #SURVEY OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER FOR JANUARY 039936 P 16
#SURVEY OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER* 067332 P 25
POWER STATION FOR THE SECOND HALF OF 1963 AND FOR CALENDAR # ENVIRONMENTAL RADIOACTIVITY AT THE SHIPPINGPORT ATOMIC 006794 P 3
ENVIRONMENTAL RADIOACTIVITY IN ILLINOIS, 1970* 077398 P 32
FUELS REPROCESSING PLANT* # ENVIRONMENTAL RADIOACTIVITY MEASUREMENT EXPERIENCE NEAR A 076433 P 31
THROUGH JUNE 1966* #EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JANUARY 013618 P 7
THROUGH DECEMBER #EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JULY 051297 P 18
#EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY* 005381 P 3
#SAMPLING AND ANALYTICAL SYSTEMS FOR MEASURING ENVIRONMENTAL RADIOACTIVITY* 070255 P 27
#SURVEY OF ENVIRONMENTAL REACTIVITY* 032834 P 14

1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (P. 29-41)* REPORT, JULY 069850 P 26
SEPTEMBER 30, 1968* # ENVIRONMENTAL RESEARCH BRANCH PROGRESS REPORT, JULY 1 TO 032537 P 14
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 008306 P 5
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 064785 P 22
TEST PHASE* # ENVIRONMENTAL SURVEILLANCE FOR PROJECT GASBUGGY PRODUCTION 056139 P 19
POWER PLANT* # ENVIRONMENTAL SURVEILLANCE OF THE CRYSTAL RIVER NUCLEAR 065092 P 23
#AN ECOLOGICAL APPROACH TO ENVIRONMENTAL SURVEILLANCE* 065109 P 24
TESTING STATION* # ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR 012287 P 6
ENVIRONMENTAL MONITORING PROGRAMME AT THE A.A.E.C. RESEARCH ESTABLISHMENT, LUCAS HEIGHTS* #THE 044009 P 17
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 023261 P 12
HANFORD FOR 1965* # EVALUATION OF RADIOLOGICAL CONDITIONS IN THE VICINITY OF 015959 P 10
WESTERN UNITED STATES, APRIL 1968-DEC. 1969* # EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE 055973 P 19
#RADIOCHEMICAL MONITORING OF WATER AFTER THE CANNIKEN EVENT, AMCHITKA ISLAND, ALASKA, JULY 1972* 074859 P 30
#ENVIRONMENTAL RADIOACTIVITY MEASUREMENT EXPERIENCE NEAR A FUELS REPROCESSING PLANT* 076433 P 31
#RADIATION DOSES FROM HYPOTHETICAL EXPOSURES TO RULISON GAS* 080822 P 34
#NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES* 023261 P 12

IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES.* #RADIONUCLIDES 051305 P 18
IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* #RADIONUCLIDES 043090 P 16
#RADIOACTIVE FALLOUT IN AIR AND RAIN - RESULTS TO THE MIDDLE OF 1969* 043805 P 17
IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* #MEASUREMENT OF TRITIUM ACTIVITY 020442 P 11
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 21
FALLOUT PROGRAM QUARTERLY SUMMARY REPORT* 078012 P 32
NO. 2* # FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT 004811 P 1
#ACTIVITIES OF AECL IN THE FIELDS OF BIOLOGY, HEALTH PHYSICS AND MEDICINE* 007047 P 3
TESTS* #PROJECT RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE) PRODUCTION 031269 P 14
#VELA UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.* 053221 P 19
#PROJECT GNOME. ISOTOPE PROGRAM - FINAL REPORT* 008175 P 5
WATERS AND ITS APPLICATION TO METEOROLOGY AND HYDROLOGY. FINAL REPORT* OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL 028116 P 13
IMMEDIATELY BEFORE AND AFTER THE SECOND PRODUCTION-TEST FLARING, PROJECT RULISON* AND PRECIPITATION COLLECTED 070416 P 27
#SURVEILLANCE DATA FOR MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA* 064274 P 22
#RADIATION DATA, MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA* 081023 P 35
#TRITIUM CONCENTRATIONS IN FOOD, 1967-1968* 056180 P 19
#TRITIUM CONCENTRATIONS IN FOOD, 1967-1968* 045385 P 18
#TRITIATED MOISTURE IN THE ATMOSPHERE SURROUNDING A NUCLEAR FUEL REPROCESSING PLANT* 027910 P 13
OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING PLANT* #OBSERVATION 080212 P 34
#ENVIRONMENTAL RADIOACTIVITY MEASUREMENT EXPERIENCE NEAR A FUELS REPROCESSING PLANT* 076433 P 31

#RADIATION DOSES FROM HYPOTHETICAL EXPOSURES TO RULISON GAS* 080822 P 34
PROGRAM* #PROJECT GASBUGGY OFF-SITE RADIOLOGICAL SAFETY REPORT GB-2R PHASE I 058859 P 20
#ENVIRONMENTAL SURVEILLANCE FOR PROJECT GASBUGGY PRODUCTION TEST PHASE* 056139 P 19
#MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT* 065252 P 24
#PROJECT GASBUGGY OFF-SITE RADIOLOGICAL SAFETY REPORT GB-2R PHASE I PROGRAM* 058859 P 20
COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL- 013347 P 6
COUNTING TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL- 013795 P 9
#TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 6
ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* #MEASUREMENT OF TRITIUM 020442 P 11
#PROJECT GNOME. ISOTOPE PROGRAM - FINAL REPORT* 008175 P 5
APRIL 1968-DEC. 1969* #EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, 055973 P 19
#MEASUREMENT OF TRITIUM IN RAIN, CITY WATER, GROUND WATER AND HOT SPRINGS.* 053240 P 19
#RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT, JAN.-JUNE 1969* 042951 P 16
1968* #RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 036421 P 15
1966 THROUGH MAY #REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 081445 P 35
OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC PROVING GROUND* #PRELIM STUDIES 064789 P 23
FACILITIES* #RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL 043090 P 16
FACILITIES.* #RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL 051305 P 18
* #RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT - JANUARY-JUNE 1972 082823 P 36
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JANUARY-JUNE 1970* 062255 P 21
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DEC., 1971* 074589 P 30
* #RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1970 068583 P 25
#TRITIUM IN THE GROUNDWATER IN JAPAN* 079785 P 34

WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* #MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL 020442 P 11
AT THE SHIPPINGPORT ATOMIC POWER STATION FOR THE SECOND HALF OF 1963 AND FOR CALENDAR YEAR 1963* RADIOACTIVITY 006794 P 3
#NUCLEAR SAFETY PROJECT - THIRD PROJECT REPORT/FIRST HALF OF 1973* 092023 P 36
#EVALUATION OF RADIOLOGICAL CONDITIONS IN THE VICINITY OF HANFORD FOR 1965* 015959 P 10
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT - JANUARY-JUNE 1972* 082823 P 36
#RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT, JAN.-JUNE 1969* 042951 P 16
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JANUARY-JUNE 1970* 062255 P 21
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DEC., 1971* 074589 P 30
#RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1968* 036421 P 15
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1970* 068583 P 25
PROGRAM.* # HASP. SECOND SPECIAL REPORT ON HIGH ALTITUDE SAMPLING 052994 P 18
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 13
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 22
#INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 19* 007430 P 4
#SECTION II - WATER - RADIOLOGICAL HEALTH DATA REPORTS* 029905 P 13
#RADIOLOGICAL HEALTH DATA* 035384 P 15
#RADIOLOGICAL HEALTH DATA* 048324 P 18

#RADIOLOGICAL	HEALTH DATA, VOLUME IV, NUMBER 3*	005143	P 1
#RADIOLOGICAL	HEALTH DATA, VOLUME IV, NUMBER 5*	005145	P 1
#RADIOLOGICAL	HEALTH DATA, VOLUME IV, NUMBER 8*	005148	P 2
#RADIOLOGICAL	HEALTH DATA, VOLUME V, NUMBER 3*	005154	P 2
#RADIOLOGICAL	HEALTH DATA, VOLUME V, NUMBER 4*	005183	P 3
#RADIOLOGICAL	HEALTH DATA, VOLUME V, NUMBER 8*	005170	P 2
#RADIOLOGICAL	HEALTH DATA, VOLUME V, NUMBER 9*	005171	P 2
#CONTROL OF TRITIUM	HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT*	064768	P 22
#ACTIVITIES OF AECL IN THE FIELDS OF BIOLOGY,	HEALTH PHYSICS AND MEDICINE*	007067	P 3
#	HEALTH PHYSICS ASPECTS OF LRL TRITIUM RELEASE*	067941	P 25
30, 1968* #	HEALTH PHYSICS BRANCH PROGRESS REPORT, JULY 1 TO SEPTEMBER	092938	P 14
PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND	HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (	069859	P 26
30, 1972* #ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND	HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE	077945	P 32
LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND	HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*	066272	P 24
#CONTROLLING TRITIUM HAZARDS AROUND	HEAVY WATER MODERATED REACTORS*	027977	P 13
PROGRAMME AT THE A.A.E.C. RESEARCH ESTABLISHMENT, LUCAS	HEIGHTS* #THE ENVIRONMENTAL MONITORING	044009	P 17
#TRITIUM IN SOUTHERN	HEMISPHERE PRECIPITATION (1953-1964).*	054496	P 19
#HASP. SECOND SPECIAL REPORT ON	HIGH ALTITUDE SAMPLING PROGRAM.*	052994	P 18
OF TRITIUM IN RAIN, CITY WATER, GROUND WATER AND	HOT SPRINGS.* #MEASUREMENT	053240	P 19
#A SAMPLING SYSTEM FOR ATMOSPHERIC	HT AND HTO*	094616	P 36
#A SAMPLING SYSTEM FOR ATMOSPHERIC HT AND	HTO*	094616	P 36
#STUDY OF TRITIATED	HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT*	073004	P 28
APPLICATION TO METEOROLOGY AND #THE MEASUREMENT OF	HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND ITS	028116	P 13
#NEW TRITIUM AND DEUTERIUM MEASUREMENTS IN ATMOSPHERIC	HYDROGEN*	013799	P 10
#VELA UNIFORM, PROJECT SHOAL. POST-SHOT	HYDROLOGIC SAFETY. FINAL REPORT.*	053221	P 19
SCANDINAVIA, WITH APPLICATIONS IN SOIL SCIENCE AND	HYDROLOGY* #THE OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT	043099	P 16
IN NATURAL WATERS AND ITS APPLICATION TO METEOROLOGY AND	HYDROLOGY. FINAL REPORT* OF HYDROGEN AND OXYGEN ISOTOPES	028116	P 13
#RADIATION DOSES FROM	HYPOTHETICAL EXPOSURES TO RULISON GAS*	080822	P 34

#ANALYTICAL METHODS IN OCEANOGRAPHY -	I. INORGANIC METHODS*	070063	P 26
#MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART	II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90*	020442	P 11
1968 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME	II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION* FOR	036537	P 15
#RESIDUAL TRITIUM AT SEDAN CRATER. PART	II. SOIL AND EJECTA STUDIES.*	053772	P 19
#SECTION	II. WATER*	030348	P 13
BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART.	III. INSTRUMENTATION* FOR 1968 TO THE USAEC DIVISION OF	036537	P 15
#ENVIRONMENTAL RADIOACTIVITY IN	ILLINOIS, 1970*	077398	P 32
OF WATER FROM SELECTED STREAMS AND PRECIPITATION COLLECTED	IMMEDIATELY BEFORE AND AFTER THE SECOND PRODUCTION-TEST	070416	P 27
19* #	INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH	007430	P 4
#ANALYTICAL METHODS IN OCEANOGRAPHY - I.	INORGANIC METHODS*	070063	P 26
28, 1962* #REPORT ON THE WORK OF THE	INSTITUTE OF NUCLEAR SCIENCES, MARCH 1, 1961 - FEBRUARY	009511	P 5
IN NATURE. A REVIEW OF THE WORK OF THE TRITIUM LABORATORY,	INSTITUTE OF NUCLEAR SCIENCES, NEW ZEALAND.* MEASUREMENTS	051441	P 18
DATA RELATED TO SAMPLES #RADIOBIOASSAY PROGRAM OF THE	INSTITUTIONAL TOTAL DIET SAMPLING NETWORK: I ANALYTICAL	074298	P 29
AND MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III.	INSTRUMENTATION* FOR 1968 TO THE USAEC DIVISION OF BIOLOGY	036537	P 15
ISLAND, ALASKA JULY 1, 1969 THRU JUNE 30, 1970* #	INTERIM SUMMARY OF TRITIUM DATA FOR STS 'A,' AMCHITKA	074003	P 29
ISLAND, ALASKA, JULY 1, 1970 THROUGH JUNE 30, 1971* #AN	INTERIM SUMMARY OF TRITIUM DATA FOR STS 'A', AMCHITKA	079363	P 33
#CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL	INVESTIGATIONS JANUARY-DECEMBER, 1964*	007122	P 4
#INTERIM SUMMARY OF TRITIUM DATA FOR STS 'A,' AMCHITKA	ISLAND, ALASKA JULY 1, 1969 THRU JUNE 30, 1970*	074003	P 29
#TRITIUM ANOMALIES ON AMCHITKA	ISLAND, ALASKA. PART I*	073928	P 28
#TRITIUM ANOMALIES ON AMCHITKA	ISLAND, ALASKA. PART II*	072581	P 28
#AN INTERIM SUMMARY OF TRITIUM DATA FOR STS 'A', AMCHITKA	ISLAND, ALASKA, JULY 1, 1970 THROUGH JUNE 30, 1971*	079363	P 33
MONITORING OF WATER AFTER THE CANNIKEN EVENT, AMCHITKA	ISLAND, ALASKA, JULY 1972* #RADIOCHEMICAL	074859	P 30
#ENVIRONMENTAL ISOTOPE DATA NO. 4: WORLD SURVEY OF	ISOTOPE CONCENTRATION IN PRECIPITATION (1968T1969)*	088469	P 36
IN PRECIPITATION (1968T1969)* #ENVIRONMENTAL	ISOTOPE DATA NO. 4: WORLD SURVEY OF ISOTOPE CONCENTRATION	088469	P 36
#PROJECT GNOME.	ISOTOPE PROGRAM - FINAL REPORT*	008175	P 5
METEOROLOGY AND #THE MEASUREMENT OF HYDROGEN AND OXYGEN	ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO	028116	P 13
OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND	ITS APPLICATION TO METEOROLOGY AND HYDROLOGY. FINAL REPORT*	028116	P 13
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND	ITS BIOLOGICAL UPTAKE*	061130	P 21
#STUDY OF TRITIATED HYDROGEN AND	ITS COMPOUNDS IN THE ENVIRONMENT*	073004	P 28
#DATA - SECTION	IV. OTHER DATA*	022813	P 11
#RADIOLOGICAL HEALTH DATA, VOLUME	IV, NUMBER 3*	005143	P 1
#RADIOLOGICAL HEALTH DATA, VOLUME	IV, NUMBER 5*	005145	P 1
#RADIOLOGICAL HEALTH DATA, VOLUME	IV, NUMBER 8*	005168	P 2

BIOLOGY AND HEALTH PHYSICS DIVISION, PROGRESS REPORT	JAN. 1 TO MAR. 31* CHALK RIVER NUCLEAR LABORATORIES,	066272	P 24
STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT,	JAN.-JUNE 1969* #RADIOLOGICAL	042931	P 16
CHEMICAL EFFLUENTS TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS	JANUARY-DECEMBER, 1964* #	007122	P 4
#ENVIRONMENTAL MONITORING REPORT-	JANUARY-JUNE 1965*	007898	P 5
#ENVIRONMENTAL MONITORING REPORT-	JANUARY-JUNE 1966*	015767	P 10
#ENVIRONMENTAL MONITORING REPORT.	JANUARY-JUNE 1967*	022001	P 11
#ENVIRONMENTAL MONITORING REPORT -	JANUARY-JUNE 1969*	036604	P 15
#ENVIRONMENTAL MONITORING REPORT -	JANUARY-JUNE 1970*	061408	P 21
STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT,	JANUARY-JUNE 1970* #RADIOLOGICAL	062259	P 21
STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT -	JANUARY-JUNE 1972* #RADIOLOGICAL	082823	P 36
#TRITIUM IN THE GROUNDWATER IN	JAPAN*	079785	P 34
STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT,	JULY-DEC., 1971* #RADIOLOGICAL	074589	P 30
#ENVIRONMENTAL MONITORING REPORT.	JULY-DECEMBER 1965 AND 1965 SUMMARY*	013349	P 6
#ENVIRONMENTAL MONITORING REPORT.	JULY-DECEMBER 1966 AND 1966 SUMMARY*	016978	P 11
STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT,	JULY-DECEMBER 1968* #RADIOLOGICAL	036421	P 15
#ENVIRONMENTAL MONITORING REPORT -	JULY-DECEMBER 1970 AND 1970 SUMMARY*	064210	P 22
STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT,	JULY-DECEMBER 1970* #RADIOLOGICAL	068583	P 25
#ENVIRONMENTAL MONITORING REPORT -	JULY-DECEMBER 1971 AND 1971 SUMMARY*	072161	P 27
MONITORING SEMI-ANNUAL REPORT- JANUARY THROUGH	JUNE, 1964* #ENVIRONMENTAL	004695	P 1

#NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* 043102 P 17

BIOLOGY AND HEALTH PHYSICS DIVISION - #CHALK RIVER NUCLEAR
#ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR
OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE
OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE
IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL
BIOLOGY AND MEDICINE. VOLUME II. #PACIFIC NORTHWEST
#PACIFIC NORTHWEST
#ENVIRONMENTAL RADIOACTIVITY AT ARGONNE NATIONAL
MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC
MONITORING RADIATION LEVELS AT BROOKHAVEN NATIONAL
MEASUREMENTS IN NATURE. A REVIEW OF THE WORK OF THE TRITIUM
OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE
MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC
MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC
LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE
LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE
LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE
RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION
#1966 ENVIRONMENTAL MONITORING RADIATION
LIVERMORE LABORATORY - #SEMIANNUAL REPORT OF ENVIRONMENTAL
LIVERMORE LABORATORY - 1972 ANNUAL REPORT* #ENVIRONMENTAL
LIVERMORE LABORATORY, JANUARY THROUGH #ENVIRONMENTAL
REPORT, APRIL 1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA
HEALTH PHYSICS DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA
ASSAY* #APPLICATION OF
#MONITORING OF TRITIUM IN GASES,
CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER.
LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE
LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE
LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE
SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE
#ENVIRONMENTAL MONITORING IN THE VICINITY OF THE
* #ENVIRONMENTAL MONITORING IN THE VICINITY OF THE
1971* #ENVIRONMENTAL MONITORING IN THE VICINITY OF THE
#HEALTH PHYSICS ASPECTS OF
PROGRAMME AT THE A.A.E.C. RESEARCH ESTABLISHMENT,

LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 - 069850 P 26
LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION, 066272 P 24
LABORATORY - JANUARY THROUGH JUNE 1971* LEVELS 066047 P 24
LABORATORY - 1972 ANNUAL REPORT* #ENVIRONMENTAL LEVELS 074335 P 29
LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH 064889 P 23
LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC DIVISION OF 036537 P 15
LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES* 065087 P 23
LABORATORY* 008493 P 5
LABORATORY* #ENVIRONMENTAL 074865 P 30
LABORATORY* #1966 ENVIRONMENTAL 056741 P 20
LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, NEW ZEALAND.* 051441 P 18
LABORATORY, JANUARY THROUGH DECEMBER, 1971* LEVELS 073660 P 28
LABORATORY, JANUARY THROUGH JUNE 1971* #ENVIRONMENTAL 034486 P 15
LABORATORY, JULY THROUGH DECEMBER 1971* #ENVIRONMENTAL 075960 P 31
LAWRENCE LIVERMORE LABORATORY - JANUARY THROUGH JUNE 1971* 066047 P 24
LAWRENCE LIVERMORE LABORATORY - 1972 ANNUAL REPORT* 074335 P 29
LAWRENCE LIVERMORE LABORATORY, JANUARY THROUGH DECEMBER, 073660 P 28
LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME 064889 P 23
LEVELS AT BROOKHAVEN NATIONAL LABORATORY* 056741 P 20
LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE 066047 P 24
LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE 074335 P 29
LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE 073660 P 28
LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS 077945 P 32
LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND 066272 P 24
LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL BETA AND ALPHA 070252 P 26
LIQUIDS, AND IN THE ENVIRONMENT* 065252 P 24
LIST NO. 1* #TRITIUM 051272 P 18
LIVERMORE LABORATORY - JANUARY THROUGH JUNE 1971* 066047 P 24
LIVERMORE LABORATORY - 1972 ANNUAL REPORT* #ENVIRONMENTAL 074335 P 29
LIVERMORE LABORATORY, JANUARY THROUGH DECEMBER, 1971* 073660 P 28
LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY 1969* 081445 P 35
LOS ALAMOS SCIENTIFIC LABORATORY* 074865 P 30
LOS ALAMOS SCIENTIFIC LABORATORY, JANUARY THROUGH JUNE 1971 034486 P 15
LOS ALAMOS SCIENTIFIC LABORATORY, JULY THROUGH DECEMBER 075960 P 31
LRL TRITIUM RELEASE* 067941 P 25
LUCAS HEIGHTS* #THE ENVIRONMENTAL MONITORING 044009 P 17

AND HEALTH PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS
#ENVIRONMENTAL RADIOACTIVITY
WATERS AND ITS APPLICATION TO METEOROLOGY AND #THE
II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* #
AND HOT SPRINGS.* #
#NEW TRITIUM AND DEUTERIUM
TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, #TRITIUM
AND SUBSURFACE WATER OF THE PACIFIC OCEAN.* #
SITES* #TRITIUM
#SAMPLING AND ANALYTICAL SYSTEMS FOR
OF AECL IN THE FIELDS OF BIOLOGY, HEALTH PHYSICS AND
ANNUAL REPORT FOR 1968 TO THE USAEC DIVISION OF BIOLOGY AND
OXYGEN ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO
#ANALYTICAL
#ANALYTICAL METHODS IN OCEANOGRAPHY - I. INORGANIC
IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW
#RADIOACTIVE FALLOUT IN AIR AND RAIN - RESULTS TO THE
#RADIATION DATA,
#SURVEILLANCE DATA FOR
#RADIOACTIVITY IN WATER - PROJECT
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER
REPROCESSING PLANT* #TRITIATED
#ELK RIVER REACTOR SYSTEM
#ENVIRONMENTAL
#ENVIRONMENTAL
LABORATORY, JANUARY THROUGH JUNE 1971* #ENVIRONMENTAL
LABORATORY* #ENVIRONMENTAL
LABORATORY, JULY THROUGH DECEMBER 1971* #ENVIRONMENTAL
ENVIRONMENT* #
ISLAND, ALASKA, JULY 1972* #RADIOCHEMICAL
ESTABLISHMENT, LUCAS HEIGHTS* #THE ENVIRONMENTAL
LABORATORY* #1966 ENVIRONMENTAL
#ENVIRONMENTAL
#ENVIRONMENTAL
#ENVIRONMENTAL
#ENVIRONMENTAL
#ENVIRONMENTAL
#ENVIRONMENTAL
#ENVIRONMENTAL
#ENVIRONMENTAL
#ENVIRONMENTAL

MAR. 31*LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY 066272 P 24
MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013347 P 6
MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013795 P 9
MEASUREMENT EXPERIENCE NEAR A FUELS REPROCESSING PLANT* 076433 P 31
MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL 028116 P 13
MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART 020442 P 11
MEASUREMENT OF TRITIUM IN RAIN, CITY WATER, GROUND WATER 053240 P 19
MEASUREMENTS IN ATMOSPHERIC HYDROGEN* 013799 P 10
MEASUREMENTS IN NATURE. A REVIEW OF THE WORK OF THE 051441 P 18
MEASUREMENTS OF BOMB PRODUCED RADIOCARBONS IN THE SURFACE 056543 P 20
MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN 013806 P 10
MEASURING ENVIRONMENTAL RADIOACTIVITY* 070255 P 27
MEDICINE* #ACTIVITIES 007047 P 3
MEDICINE. VOLUME II. PHYSICAL SCIENCES. PART. III. 036537 P 15
METEOROLOGY AND HYDROLOGY. FINAL REPORT* OF HYDROGEN AND 028116 P 13
METHODS IN OCEANOGRAPHY - I. INORGANIC METHODS* 070063 P 26
METHODS* 070063 P 26
MEXICO, AUGUST 1966 THROUGH MAY 1969* SURVEY OF TRITIUM 081445 P 35
MIDDLE OF 1969* 043805 P 17
MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA* 081023 P 35
MILK AND FOOD, WATER, AIR AND DEPOSITION, AND OTHER DATA* 064274 P 27
MILROW* 044832 P 17
MODERATED REACTORS* 027977 P 13
MOISTURE IN THE ATMOSPHERE SURROUNDING A NUCLEAR FUEL 027910 P 13
MONITORING DATA* 016929 P 10
MONITORING DATA* 082303 P 35
MONITORING IN THE OPERATION OF A NUCLEAR POWER STATION* 006924 P 3
MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC 034486 P 15
MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC 074865 P 30
MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC 075960 P 31
MONITORING OF TRITIUM IN GASES, LIQUIDS, AND IN THE 065252 P 24
MONITORING OF WATER AFTER THE CANNIKEN EVENT, AMCHITKA 074859 P 30
MONITORING PROGRAMME AT THE A.A.E.C. RESEARCH 044009 P 17
MONITORING RADIATION LEVELS AT BROOKHAVEN NATIONAL 056741 P 20
MONITORING REPORT - JANUARY-JUNE 1969* 036604 P 15
MONITORING REPORT - JANUARY-JUNE 1970* 061408 P 21
MONITORING REPORT - JULY 1967 AND 1967 SUMMARY* 025581 P 12
MONITORING REPORT - JULY-DECEMBER 1970 AND 1970 SUMMARY* 064210 P 22
MONITORING REPORT - JULY-DECEMBER 1971 AND 1971 SUMMARY* 072141 P 27
MONITORING REPORT. JANUARY-JUNE 1967* 022001 P 11
MONITORING REPORT. JULY-DECEMBER 1965 AND 1965 SUMMARY* 013345 P 6
MONITORING REPORT. JULY-DECEMBER 1966 AND 1966 SUMMARY* 016978 P 11
MONITORING REPORT- JANUARY-JUNE 1965* 007898 P 5

#ENVIRONMENTAL	MONITORING REPORT- JANUARY-JUNE 1966*	015767 P 10
#ENVIRONMENTAL	MONITORING REPORT- JULY - DECEMBER, 1964 AND 1964 SUMMARY*	007462 P 4
#ANNUAL ENVIRONMENTAL	MONITORING REPORT: CALENDAR YEAR 1972*	074531 P 29
1972* #ENVIRONMENTAL	MONITORING REPORT: PERIOD COVERING MAY 1, 1972 - JULY 31,	078449 P 32
#ENVIRONMENTAL	MONITORING SEMI-ANNUAL REPORT- JANUARY THROUGH JUNE, 1964*	004695 P 1
#ENVIRONMENTAL	MONITORING TECHNIQUES*	082302 P 35
BIBLIOGRAPHY* #	MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED	082225 P 35
CHANGES IN BACKGROUND RADIATION LEVELS AT BROOKHAVEN	NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE	064889 P 23
#ENVIRONMENTAL RADIOACTIVITY AT ARGONNE	NATIONAL LABORATORY*	008493 P 5
ENVIRONMENTAL MONITORING RADIATION LEVELS AT BROOKHAVEN	NATIONAL LABORATORY* #1966	056741 P 20
#ENVIRONMENTAL TRITIUM STUDIES AT THE	NATIONAL REACTOR TESTING STATION*	012287 P 6
TRITIUM IN RECENT YEARS* #	NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND	063102 P 17
#THE MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN	NATURAL WATERS AND ITS APPLICATION TO METEOROLOGY AND	028116 P 13
OF H-3 AND SR-90* #MEASUREMENT OF TRITIUM ACTIVITY IN	NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT	020442 P 11
#THE CURRENT TRITIUM CONTENTS OF	NATURAL WATERS*	061936 P 21
INSTITUTE OF NUCLEAR SCIENCES, NEW #TRITIUM MEASUREMENTS IN	NATURE. A REVIEW OF THE WORK OF THE TRITIUM LABORATORY,	051441 P 18
#ENVIRONMENTAL RADIOACTIVITY MEASUREMENT EXPERIENCE	NEAR A FUELS REPROCESSING PLANT*	076433 P 31
PROGRAM OF THE INSTITUTIONAL TOTAL DIET SAMPLING	NETWORK: I ANALYTICAL DATA RELATED TO SAMPLES COLLECTED	074298 P 29
#RADIOACTIVITY IN WATER, CENTRAL	NEVADA TEST AREA*	075733 P 31
#	NEW DOSE ESTIMATES FROM CHRONIC TRITIUM EXPOSURES*	023261 P 12
TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA,	NEW MEXICO, AUGUST 1966 THROUGH MAY 1969* SURVEY OF	081445 P 35
HYDROGEN* #	NEW TRITIUM AND DEUTERIUM MEASUREMENTS IN ATMOSPHERIC	013799 P 10
#TRITIUM IN	NEW YORK STATE WATERS, 1965*	033090 P 14
OF THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES,	NEW ZEALAND.* MEASUREMENTS IN NATURE. A REVIEW OF THE WORK	051441 P 18
DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. #PACIFIC	NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE USAEC	036537 P 15
SCIENCES* #PACIFIC	NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC	065087 P 23
#INDEX TO HAZARDS CONTROL QUARTERLY REPORTS,	NOS. 1 THROUGH 19*	007430 P 4
#TRITIATED MOISTURE IN THE ATMOSPHERE SURROUNDING A	NUCLEAR FUEL REPROCESSING PLANT*	027910 P 13
#OBSERVATION OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A	NUCLEAR FUEL REPROCESSING PLANT*	080212 P 34
1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - #CHALK RIVER	NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30,	069850 P 26
PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER	NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS DIVISION,	066272 P 24
#ENVIRONMENTAL SURVEILLANCE OF THE CRYSTAL RIVER	NUCLEAR POWER PLANT*	065092 P 23
OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM PWR	NUCLEAR POWER PLANTS* #BEHAVIOR IN RIVERS	075362 P 31
LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH	NUCLEAR POWER REACTOR PLANTS*LEVELS AT BROOKHAVEN NATIONAL	064889 P 23
#ENVIRONMENTAL MONITORING IN THE OPERATION OF A	NUCLEAR POWER STATION*	006924 P 3
OF 1973* #	NUCLEAR SAFETY PROJECT - THIRD PROJECT REPORT/FIRST HALF	092023 P 36
#REPORT ON THE WORK OF THE INSTITUTE OF	NUCLEAR SCIENCES, MARCH 1, 1961 - FEBRUARY 28, 1962*	009511 P 5
REVIEW OF THE WORK OF THE TRITIUM LABORATORY, INSTITUTE OF	NUCLEAR SCIENCES, NEW ZEALAND.* MEASUREMENTS IN NATURE. A	051441 P 18
#RADIOLOGICAL HEALTH DATA, VOLUME V,	NUMBER 3*	005154 P 2
#RADIOLOGICAL HEALTH DATA, VOLUME IV,	NUMBER 3*	005143 P 1
#RADIOLOGICAL HEALTH DATA, VOLUME V,	NUMBER 4*	005183 P 3
#RADIOLOGICAL HEALTH DATA, VOLUME IV,	NUMBER 5*	005145 P 1
#RADIOLOGICAL HEALTH DATA, VOLUME IV,	NUMBER 8*	005148 P 2
#RADIOLOGICAL HEALTH DATA, VOLUME V,	NUMBER 8*	005170 P 2
#RADIOLOGICAL HEALTH DATA, VOLUME V,	NUMBER 9*	005171 P 2
NUCLEAR FUEL REPROCESSING PLANT* #	OBSERVATION OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A	080212 P 34
WITH APPLICATIONS IN SOIL SCIENCE AND HYDROLOGY* #THE	OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA,	043099 P 16
IN THE SURFACE AND SUBSURFACE WATER OF THE PACIFIC	OCEAN.* #MEASUREMENTS OF BOMB PRODUCED RADIOCARBONS	056543 P 20
#ANALYTICAL METHODS IN	OCEANOGRAPHY - I. INORGANIC METHODS*	070063 P 26
#TRITIUM CONCENTRATION IN RAIN, RIVERS,	OCEANS AND OTHER WATER. LIST NO. 1*	051272 P 18
RE-ENTRY PORTION OF PHASE III* #	OFF-SITE RADIOLOGICAL SAFETY PROGRAM FOR PROJECT RULISON	079362 P 33
#PROJECT GASBUGGY	OFF-SITE RADIOLOGICAL SAFETY REPORT GB-2R PHASE I PROGRAM*	058859 P 20
#ENVIRONMENTAL MONITORING IN THE	OPERATION OF A NUCLEAR POWER STATION*	006924 P 3
#PROJECT RULISON FINAL	OPERATIONAL RADIOACTIVITY REPORT (ON THE) PRODUCTION TESTS*	031269 P 14
#DATA - SECTION IV.	OTHER DATA*	022813 P 11
DATA, MILK AND FOOD, WATER, AIR AND DEPOSITION, AND	OTHER DATA* #RADIATION	081023 P 35
DATA FOR MILK AND FOOD, WATER, AIR AND DEPOSITION, AND	OTHER DATA* #SURVEILLANCE	064274 P 22
#TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND	OTHER WATER. LIST NO. 1*	051272 P 18
#RADIOACTIVE FALLOUT	OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE*	061130 P 21
METEOROLOGY AND HYDROLOGY. #THE MEASUREMENT OF HYDROGEN AND	OXYGEN ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO	028116 P 13
HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (	P. 29-41)* REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND	069850 P 26
USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II. #	PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE	036537 P 15
ECOLOGIC SCIENCES* #	PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1970,	065087 P 23
RADIOCARBONS IN THE SURFACE AND SUBSURFACE WATER OF THE	PACIFIC OCEAN.* #MEASUREMENTS OF BOMB PRODUCED	056543 P 20
#PRELIM STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN	PACIFIC PROVING GROUND*	064789 P 23
#TRITIUM ANOMALIES ON AMCHITKA ISLAND, ALASKA.	PART I*	073928 P 28
* #MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS.	PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90	020442 P 11
#RESIDUAL TRITIUM AT SEDAN CRATER.	PART II. SOIL AND EJECTA STUDIES.*	053772 P 19
#TRITIUM ANOMALIES ON AMCHITKA ISLAND, ALASKA.	PART II*	072581 P 28
OF BIOLOGY AND MEDICINE. VOLUME II. PHYSICAL SCIENCES.	PART. III. INSTRUMENTATION* FOR 1968 TO THE USAEC DIVISION	036537 P 15
#PRELIM STUDIES OF	PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC PROVING GROUND*	064789 P 23
#PROJECT GASBUGGY OFF-SITE RADIOLOGICAL SAFETY REPORT GB-2R	PHASE I PROGRAM*	058859 P 20
SAFETY PROGRAM FOR PROJECT RULISON RE-ENTRY PORTION OF	PHASE III* #OFF-SITE RADIOLOGICAL	079362 P 33
SURVEILLANCE FOR PROJECT GASBUGGY PRODUCTION TEST	PHASE* #ENVIRONMENTAL	056139 P 19
TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II.	PHYSICAL SCIENCES. PART. III. INSTRUMENTATION* FOR 1968	036537 P 15
#ACTIVITIES OF AECL IN THE FIELDS OF BIOLOGY, HEALTH	PHYSICS AND MEDICINE*	007047 P 3

#HEALTH	PHYSICS ASPECTS OF LRL TRITIUM RELEASE*	067941	P 25
1968* #HEALTH	PHYSICS BRANCH PROGRESS REPORT, JULY 1 TO SEPTEMBER 30,	032538	P 14
REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH	PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (P. 29-41)	069850	P 26
#ATOMIC ENERGY OF CANADA LIMITED, BIOLOGY AND HEALTH	PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972*	077945	P 32
CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH	PHYSICS DIVISION, PROGRESS REPORT JAN. 1 TO MAR. 31*	066272	P 24
JULY THROUGH DECEMBER 1963.* #EFFECT OF THE SAVANNAH RIVER	PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT	051297	P 18
JANUARY THROUGH JUNE 1966* #EFFECT OF THE SAVANNAH RIVER	PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT	013618	P 7
#EFFECT OF THE SAVANNAH RIVER	PLANT ON ENVIRONMENTAL RADIOACTIVITY*	005381	P 3
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER	PLANT WASTE DISPOSAL FACILITIES.*	051305	P 18
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER	PLANT WASTE DISPOSAL FACILITIES*	043090	P 16
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER	PLANT*	064768	P 22
SURVEILLANCE OF THE CRYSTAL RIVER NUCLEAR POWER	PLANT* #ENVIRONMENTAL	065092	P 23
IN THE ATMOSPHERE SURROUNDING A NUCLEAR FUEL REPROCESSING	PLANT* #TRITIATED MOISTURE	027910	P 13
TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING	PLANT* #OBSERVATION OF AIRBORNE	080212	P 34
MEASUREMENT EXPERIENCE NEAR A FUELS REPROCESSING	PLANT* #ENVIRONMENTAL RADIOACTIVITY	076433	P 31
AND RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR POWER	PLANTS* #BEHAVIOR IN RIVERS OF RADIOCOBALT	075362	P 31
WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR	PLANTS*BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS	064889	P 23
RADIOLOGICAL SAFETY PROGRAM FOR PROJECT RULISON RE-ENTRY	PORTION OF PHASE III* #OFF-SITE	079362	P 33
#VELA UNIFORM, PROJECT SHOAL.	POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.*	053221	P 19
#ENVIRONMENTAL SURVEILLANCE OF THE CRYSTAL RIVER NUCLEAR	POWER PLANT*	065092	P 23
AND RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR	POWER PLANTS* #BEHAVIOR IN RIVERS OF RADIOCOBALT	075362	P 31
AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR	POWER REACTOR PLANTS* AT BROOKHAVEN NATIONAL LABORATORY	064889	P 23
#ENVIRONMENTAL RADIOACTIVITY AT THE SHIPPINGPORT ATOMIC	POWER STATION FOR THE SECOND HALF OF 1963 AND FOR CALENDAR	006794	P 3
#ENVIRONMENTAL MONITORING IN THE OPERATION OF A NUCLEAR	POWER STATION*	006924	P 3
#TRITIUM IN SOUTHERN HEMISPHERE	PRECIPITATION (1953-1964).*	054496	P 19
DATA NO. 4: WORLD SURVEY OF ISOTOPE CONCENTRATION IN	PRECIPITATION (1968T1969)* #ENVIRONMENTAL ISOTOPE	088469	P 36
#TRITIUM IN	PRECIPITATION AT CANADIAN SITES (1953-1963).*	054494	P 19
#RADIOCHEMICAL ANALYSIS OF WATER FROM SELECTED STREAMS AND	PRECIPITATION COLLECTED IMMEDIATELY BEFORE AND AFTER THE	070416	P 27
#TRITIUM CONCENTRATION IN	PRECIPITATION, 1967-1968*	044669	P 17
PACIFIC PROVING GROUND* #	PRELIM STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN	064789	P 23
OF THE UPPER ATMOSPHERE* #	PROBLEMS ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION	025597	P 12
OF THE PACIFIC OCEAN.* #MEASUREMENTS OF BOMB	PRODUCED RADIOCARBONS IN THE SURFACE AND SUBSURFACE WATER	056543	P 20
#ENVIRONMENTAL SURVEILLANCE FOR PROJECT GASBUGGY	PRODUCTION TEST PHASE*	056139	P 19
RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE)	PRODUCTION TESTS* #PROJECT	031269	P 14
COLLECTED IMMEDIATELY BEFORE AND AFTER THE SECOND	PRODUCTION-TEST FLARING, PROJECT RULISON*AND PRECIPITATION	070416	P 27
#HASP. SECOND SPECIAL REPORT ON HIGH ALTITUDE SAMPLING	PROGRAM.*	052994	P 18
HEIGHTS* #THE ENVIRONMENTAL MONITORING	PROGRAMME AT THE A.A.E.C. RESEARCH ESTABLISHMENT, LUCAS	044009	P 17
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD	PROJECT - JANUARY-JUNE 1972*	082823	P 36
#NUCLEAR SAFETY	PROJECT - THIRD PROJECT REPORT/FIRST HALF OF 1973*	092023	P 36
PHASE I PROGRAM* #	PROJECT GASBUGGY OFF-SITE RADIOLOGICAL SAFETY REPORT GB-2R	058859	P 20
#ENVIRONMENTAL SURVEILLANCE FOR	PROJECT GASBUGGY PRODUCTION TEST PHASE*	056139	P 19
#	PROJECT GNOME. ISOTOPE PROGRAM - FINAL REPORT*	008175	P 5
#RADIOACTIVITY IN WATER -	PROJECT MILROW*	044832	P 17
#NUCLEAR SAFETY PROJECT - THIRD	PROJECT REPORT/FIRST HALF OF 1973*	092023	P 36
THE) PRODUCTION TESTS* #	PROJECT RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON	031269	P 14
#OFF-SITE RADIOLOGICAL SAFETY PROGRAM FOR	PROJECT RULISON RE-ENTRY PORTION OF PHASE III*	079362	P 33
BEFORE AND AFTER THE SECOND PRODUCTION-TEST FLARING,	PROJECT RULISON* AND PRECIPITATION COLLECTED IMMEDIATELY	070416	P 27
#VELA UNIFORM,	PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL REPORT.*	053221	P 19
RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD	PROJECT, JAN.-JUNE 1969* #	042951	P 16
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD	PROJECT, JANUARY-JUNE 1970*	062255	P 21
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD	PROJECT, JULY-DEC., 1971*	074589	P 30
RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD	PROJECT, JULY-DECEMBER 1968* #	036421	P 15
#RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD	PROJECT, JULY-DECEMBER 1970*	068583	P 25
CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE	PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM	013347	P 6
CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE	PROPORTIONAL-COUNTING TECHNIQUE* #TRITIUM	013795	P 9
STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC	PROVING GROUND* #PRELIM	064789	P 23
RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM	PWR NUCLEAR POWER PLANTS* #BEHAVIOR IN	075362	P 31
#	RADIATION DATA*	072249	P 28
#	RADIATION DATA*	074869	P 30
#	RADIATION DATA*	079183	P 32
#	RADIATION DATA*	070616	P 27
AND OTHER DATA* #	RADIATION DATA, MILK AND FOOD, WATER, AIR AND DEPOSITION,	081023	P 35
#	RADIATION DOSES FROM HYPOTHETICAL EXPOSURES TO RULISON GAS*	080822	P 34
OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND	RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND	064889	P 23
#1966 ENVIRONMENTAL MONITORING	RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY*	056741	P 20
#FATE OF	RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2*	004811	P 1
#PROBLEMS ARISING IN THE STUDY OF	RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE*	025597	P 12
MIDDLE OF 1969* #	RADIOACTIVE FALLOUT IN AIR AND RAIN - RESULTS TO THE	043805	P 17
UPTAKE* #	RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL	061130	P 21
#ENVIRONMENTAL	RADIOACTIVITY AT ARGONNE NATIONAL LABORATORY*	008493	P 5
#SURVEY OF ENVIRONMENTAL	RADIOACTIVITY AT ELK RIVER FOR JANUARY THROUGH JUNE 1969*	039936	P 16
#SURVEY OF ENVIRONMENTAL	RADIOACTIVITY AT ELK RIVER*	067332	P 25
THE SECOND HALF OF 1963 AND FOR CALENDAR #ENVIRONMENTAL	RADIOACTIVITY AT THE SHIPPINGPORT ATOMIC POWER STATION FOR	006794	P 3
#ENVIRONMENTAL	RADIOACTIVITY IN ILLINOIS, 1970*	077398	P 32
LABORATORY - #SEMIANNUAL REPORT OF ENVIRONMENTAL LEVELS OF	RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE	066047	P 24
LABORATORY - 1972 ANNUAL REPORT* #ENVIRONMENTAL LEVELS OF	RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE	074335	P 29
LABORATORY, JANUARY THROUGH #ENVIRONMENTAL LEVELS OF	RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE	073660	P 28
#	RADIOACTIVITY IN WATER - PROJECT MILROW*	044832	P 17
#	RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA*	075733	P 31
REPROCESSING PLANT* #ENVIRONMENTAL	RADIOACTIVITY MEASUREMENT EXPERIENCE NEAR A FUELS	076433	P 31
#PROJECT RULISON FINAL OPERATIONAL	RADIOACTIVITY REPORT (ON THE) PRODUCTION TESTS*	031269	P 14
#EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL	RADIOACTIVITY. SEMIANNUAL REPORT JANUARY THROUGH JUNE 1966*	013618	P 7
1963.* #EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL	RADIOACTIVITY. SEMIANNUAL REPORT JULY THROUGH DECEMBER	051297	P 18
#EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL	RADIOACTIVITY*	005381	P 3

SAMPLING AND ANALYTICAL SYSTEMS FOR MEASURING ENVIRONMENTAL RADIOACTIVITY* # 070255 P 27
SAMPLING NETWORK: I ANALYTICAL DATA RELATED TO SAMPLES # RADIOBIOASSAY PROGRAM OF THE INSTITUTIONAL TOTAL DIET 074298 P 29
DECEMBER 1972* #AMCHITKA RADIOBIOLOGICAL PROGRAM PROGRESS REPORT FOR MARCH 1972 TO 083413 P 36
APRIL 1971* #AMCHITKA RADIOBIOLOGICAL PROGRAM PROGRESS REPORT, JULY 1970 TO 066917 P 25
FEBRUARY 1972* #AMCHITKA RADIOBIOLOGICAL PROGRAM PROGRESS REPORT, MAY 1971 TO 079392 P 33
RADIOCARBON AND TRITIUM IN THE UPPER TROPOSPHERE* 013797 P 9
PACIFIC OCEAN.* #MEASUREMENTS OF BOMB PRODUCED RADIOCARBONS IN THE SURFACE AND SUBSURFACE WATER OF THE 056543 P 20
PRECIPITATION COLLECTED IMMEDIATELY BEFORE AND AFTER THE # RADIOCHEMICAL ANALYSIS OF WATER FROM SELECTED STREAMS AND 070416 P 27
EVENT, AMCHITKA ISLAND, ALASKA, JULY 1972* # RADIOCHEMICAL MONITORING OF WATER AFTER THE CANNIKEN 074859 P 30
NUCLEAR POWER PLANTS* #BEHAVIOR IN RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM PWR 075362 P 31
* #EVALUATION OF RADIOLOGICAL CONDITIONS IN THE VICINITY OF HANFORD FOR 1965 015959 P 10
#SECTION II - WATER - RADIOLOGICAL HEALTH DATA REPORTS* 029905 P 13
RADIOLOGICAL HEALTH DATA* 048324 P 18
RADIOLOGICAL HEALTH DATA* 035384 P 15
RADIOLOGICAL HEALTH DATA, VOLUME IV, NUMBER 3* 005143 P 1
RADIOLOGICAL HEALTH DATA, VOLUME IV, NUMBER 5* 005145 P 1
RADIOLOGICAL HEALTH DATA, VOLUME IV, NUMBER 8* 005148 P 2
RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 3* 005154 P 2
RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 4* 005183 P 3
RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 8* 005170 P 2
RADIOLOGICAL HEALTH DATA, VOLUME V, NUMBER 9* 005171 P 2
PORTION OF PHASE III* #OFF-SITE RADIOLOGICAL SAFETY PROGRAM FOR PROJECT RULISON RE-ENTRY 079362 P 33
#PROJECT GASBUGGY OFF-SITE RADIOLOGICAL SAFETY REPORT GB-2R PHASE I PROGRAM* 058859 P 20
HANFORD PROJECT, JAN.-JUNE 1969* # RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE 042951 P 16
HANFORD PROJECT, JULY-DECEMBER 1968* # RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE 036421 P 15
PROJECT, JANUARY-JUNE 1970* # RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD 062255 P 21
PROJECT, JULY-DECEMBER 1970* # RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD 068583 P 25
PROJECT, JULY-DEC., 1971* # RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD 074589 P 30
PROJECT - JANUARY-JUNE 1972* # RADIOLOGICAL STATUS OF THE GROUNDWATER BENEATH THE HANFORD 082823 P 36
#BEHAVIOR IN RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM PWR NUCLEAR POWER PLANTS* 075362 P 31
WASTE DISPOSAL FACILITIES.* # RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT 051305 P 18
WASTE DISPOSAL FACILITIES* # RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT 043090 P 16
#RADIOACTIVE FALLOUT IN AIR AND RAIN - RESULTS TO THE MIDDLE OF 1969* 043805 P 17
#MEASUREMENT OF TRITIUM IN RAIN, CITY WATER, GROUND WATER AND HOT SPRINGS.* 053240 P 19
#TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1* 051272 P 18
#OFF-SITE RADIOLOGICAL SAFETY PROGRAM FOR PROJECT RULISON RE-ENTRY PORTION OF PHASE III* 079362 P 33
#SURVEY OF ENVIRONMENTAL REACTIVITY* 032834 P 14
SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS* AT BROOKHAVEN NATIONAL LABORATORY AND 064889 P 23
#ELK RIVER REACTOR SYSTEM MONITORING DATA* 016929 P 10
#ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION* 012287 P 6
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 13
BACKGROUND RADIATION LEVELS AT BROOKHAVEN NATIONAL #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN 064889 P 23
CONCENTRATION OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* #NATURAL 043102 P 17
THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY # REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN 081445 P 35
BROOKHAVEN #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION LEVELS AT 064889 P 23
TOTAL DIET SAMPLING NETWORK: I ANALYTICAL DATA RELATED TO SAMPLES COLLECTED DURING 1966-1968* 074298 P 29
#HEALTH PHYSICS ASPECTS OF LRL TRITIUM RELEASE* 067941 P 25
LEVELS AT BROOKHAVEN NATIONAL #A RECAPITULATION OF EFFLUENT RELEASES AND RELATED CHANGES IN BACKGROUND RADIATION 064889 P 23
#ENVIRONMENTAL MONITORING REPORT, JANUARY-JUNE 1967* 022001 P 11
#ENVIRONMENTAL MONITORING REPORT, JULY-DECEMBER 1965 AND 1965 SUMMARY* 013345 P 6
#ENVIRONMENTAL MONITORING REPORT, JULY-DECEMBER 1966 AND 1966 SUMMARY* 016978 P 11
UNIFORM, PROJECT SHOAL, POST-SHOT HYDROLOGIC SAFETY, FINAL REPORT.* #VELA 053221 P 19
#ENVIRONMENTAL MONITORING SEMI-ANNUAL REPORT- JANUARY THROUGH JUNE, 1964* 004695 P 1
#ENVIRONMENTAL MONITORING REPORT- JANUARY-JUNE 1965* 007898 P 5
#ENVIRONMENTAL MONITORING REPORT- JANUARY-JUNE 1966* 015767 P 10
#ENVIRONMENTAL MONITORING REPORT- JULY - DECEMBER, 1964 AND 1964 SUMMARY* 007462 P 4
#NUCLEAR SAFETY PROJECT - THIRD PROJECT REPORT/FIRST HALF OF 1973* 092023 P 36
LIMITED, BIOLOGY AND HEALTH PHYSICS DIVISION PROGRESS REPORT, APRIL 1 TO JUNE 30, 1972* #ATOMIC ENERGY OF CANADA 077945 P 32
PHYSICS DIVISION #CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH 069850 P 26
#HEALTH PHYSICS BRANCH PROGRESS REPORT, JULY 1 TO SEPTEMBER 30, 1968* 032538 P 14
#ENVIRONMENTAL RESEARCH BRANCH PROGRESS REPORT, JULY 1 TO SEPTEMBER 30, 1968* 032537 P 14
#AMCHITKA RADIOBIOLOGICAL PROGRAM PROGRESS REPORT, JULY 1970 TO APRIL 1971* 066917 P 25
#AMCHITKA RADIOBIOLOGICAL PROGRAM PROGRESS REPORT, MAY 1971 TO FEBRUARY 1972* 079392 P 33
#ANNUAL ENVIRONMENTAL MONITORING REPORT: CALENDAR YEAR 1972* 074531 P 29
#ENVIRONMENTAL MONITORING REPORT: PERIOD COVERING MAY 1, 1972 - JULY 31, 1972* 078449 P 32
#SECTION II - WATER - RADIOLOGICAL HEALTH DATA REPORTS* 029905 P 13
#INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1 THROUGH 19* 007430 P 4
MOISTURE IN THE ATMOSPHERE SURROUNDING A NUCLEAR FUEL REPROCESSING PLANT* #TRITIATED 027910 P 13
OF AIRBORNE TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING PLANT* #OBSERVATION 080212 P 34
RADIOACTIVITY MEASUREMENT EXPERIENCE NEAR A FUELS REPROCESSING PLANT* #ENVIRONMENTAL 076693 P 31
1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - ENVIRONMENTAL RESEARCH BRANCH (P. 29-41)* REPORT, JULY 1 TO SEPT. 30, 069850 P 26
1968* #ENVIRONMENTAL RESEARCH BRANCH PROGRESS REPORT, JULY 1 TO SEPTEMBER 30, 032537 P 14
#THE ENVIRONMENTAL MONITORING PROGRAMME AT THE A.A.E.C. RESEARCH ESTABLISHMENT, LUCAS HEIGHTS* 044009 P 17
STUDIES.* # RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA 053772 P 19
#RADIOACTIVE FALLOUT IN AIR AND RAIN - RESULTS TO THE MIDDLE OF 1969* 043805 P 17
NUCLEAR SCIENCES, NEW #TRITIUM MEASUREMENTS IN NATURE. A REVIEW OF THE WORK OF THE TRITIUM LABORATORY, INSTITUTE OF 051441 P 18
#SURVEY OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER FOR JANUARY THROUGH JUNE 1969* 039936 P 16
SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION #CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO 069850 P 26
DIVISION, PROGRESS #ATOMIC ENERGY OF CANADA LIMITED, CHALK RIVER NUCLEAR LABORATORIES, BIOLOGY AND HEALTH PHYSICS 066272 P 24
#ENVIRONMENTAL SURVEILLANCE OF THE CRYSTAL RIVER NUCLEAR POWER PLANT* 065092 P 23
REPORT JULY THROUGH DECEMBER 1963.* #EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL 051297 P 18
REPORT JANUARY THROUGH JUNE 1966* #EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL 013618 P 7
#EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY* 005381 P 3
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES.* 051305 P 18
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* 063090 P 16
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 22
#ELK RIVER REACTOR SYSTEM MONITORING DATA* 016929 P 10
#STATUS REPORT NO. 5 ON CLINCH RIVER STUDY* 007082 P 4

TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING 013347 P 6
TECHNIQUE* #TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING 013795 P 9
#SURVEY OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER* 067332 P 25
PWR NUCLEAR POWER PLANTS* #BEHAVIOR IN RIVERS OF RADIOCOBALT AND RADIOMANGANESE IN EFFLUENTS FROM 075362 P 31
#TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1* 051272 P 18
PRODUCTION TESTS* #PROJECT RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE) 031269 P 14
#RADIATION DOSES FROM HYPOTHETICAL EXPOSURES TO RULISON GAS* 080822 P 34
#OFF-SITE RADIOLOGICAL SAFETY PROGRAM FOR PROJECT RULISON RE-ENTRY PORTION OF PHASE III* 079362 P 33
AND AFTER THE SECOND PRODUCTION-TEST FLARING, PROJECT RULISON* AND PRECIPITATION COLLECTED IMMEDIATELY BEFORE 070416 P 27

PHASE III* #OFF-SITE RADIOLOGICAL SAFETY PROGRAM FOR PROJECT RULISON RE-ENTRY PORTION OF 079362 P 33
#NUCLEAR SAFETY PROJECT - THIRD PROJECT REPORT/FIRST HALF OF 1973* 092023 P 36
#PROJECT GASBUGGY OFF-SITE RADIOLOGICAL SAFETY REPORT GB-2R PHASE I PROGRAM* 058859 P 20
#VELA UNIFORM, PROJECT SHOAL, POST-SHOT HYDROLOGIC SAFETY, FINAL REPORT.* 053221 P 19
TOTAL DIET SAMPLING NETWORK: I ANALYTICAL DATA RELATED TO SAMPLES COLLECTED DURING 1966-1968* OF THE INSTITUTIONAL 074298 P 29
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 064785 P 22
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND TRITIUM* 008306 P 5
ENVIRONMENTAL RADIOACTIVITY* # SAMPLING AND ANALYTICAL SYSTEMS FOR MEASURING 070255 P 27
#RADIOBIOASSAY PROGRAM OF THE INSTITUTIONAL TOTAL DIET SAMPLING NETWORK: I ANALYTICAL DATA RELATED TO SAMPLES 074298 P 29
#HASP, SECOND SPECIAL REPORT ON HIGH ALTITUDE SAMPLING PROGRAM.* 052994 P 18
#A SAMPLING SYSTEM FOR ATMOSPHERIC HT AND HTO* 094616 P 36
SEMIANNUAL REPORT JULY THROUGH DECEMBER 1963.#EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. 051297 P 18
SEMIANNUAL REPORT JANUARY THROUGH JUNE 1966* #EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. 013618 P 7
#EFFECT OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY* 005381 P 3
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES.* 051305 P 18
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT WASTE DISPOSAL FACILITIES* 043090 P 16
#CONTROL OF TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT* 064768 P 22
HYDROLOGY* #THE OCCURRENCE OF C-14 AND TRITIUM THROUGHOUT SCANDINAVIA, WITH APPLICATIONS IN SOIL SCIENCE AND 043099 P 16
TRITIUM THROUGHOUT SCANDINAVIA, WITH APPLICATIONS IN SOIL SCIENCE AND HYDROLOGY* #THE OCCURRENCE OF C-14 AND 043099 P 16
NORTHWEST LABORATORY ANNUAL REPORT FOR 1970, ECOLOGIC SCIENCES* #PACIFIC 065087 P 23
USAEC DIVISION OF BIOLOGY AND MEDICINE, VOLUME II. PHYSICAL SCIENCES, PART. III. INSTRUMENTATION* FOR 1968 TO THE 036537 P 15
#REPORT ON THE WORK OF THE INSTITUTE OF NUCLEAR SCIENCES, MARCH 1, 1961 - FEBRUARY 28, 1962* 009511 P 5
OF THE WORK OF THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, NEW ZEALAND.* MEASUREMENTS IN NATURE. A REVIEW 051441 P 18
#ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY* 074865 P 30
#ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY, JANUARY THROUGH JUNE 1971* 034486 P 15
#ENVIRONMENTAL MONITORING IN THE VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY, JULY THROUGH DECEMBER 1971* 075960 P 31
#APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL BETA AND ALPHA ASSAY* 070252 P 26
AT THE SHIPPINGPORT ATOMIC POWER STATION FOR THE SECOND HALF OF 1963 AND FOR CALENDAR YEAR 1963* 006794 P 3
PRECIPITATION COLLECTED IMMEDIATELY BEFORE AND AFTER THE SECOND PRODUCTION-TEST FLARING, PROJECT RULISON* AND 070416 P 27
#HASP. SECOND SPECIAL REPORT ON HIGH ALTITUDE SAMPLING PROGRAM.* 052994 P 18
SECTION II - WATER - RADIOLOGICAL HEALTH DATA REPORTS* 029905 P 13
SECTION II. WATER* 030348 P 13
#DATA - SECTION IV. OTHER DATA* 022813 P 11
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 19
#MONITORING, CONTROL, AND DISPOSAL OF TRITIUM. A SELECTED BIBLIOGRAPHY* 082225 P 35
BEFORE AND AFTER THE #RADIOCHEMICAL ANALYSIS OF WATER FROM SELECTED STREAMS AND PRECIPITATION COLLECTED IMMEDIATELY 070416 P 27
#ENVIRONMENTAL MONITORING SEMI-ANNUAL REPORT- JANUARY THROUGH JUNE, 1964* 004695 P 1
OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JANUARY THROUGH JUNE 1966* #EFFECT 013618 P 7
OF THE SAVANNAH RIVER PLANT ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JULY THROUGH DECEMBER 1963.* #EFFECT 051297 P 18
IN THE VICINITY OF THE LAWRENCE LIVERMORE LABORATORY - # SEMIANNUAL REPORT OF ENVIRONMENTAL LEVELS OF RADIOACTIVITY 066047 P 24
CHALK RIVER NUCLEAR LABORATORIES PROGRESS REPORT, JULY 1 TO SEPT. 30, 1971 - BIOLOGY AND HEALTH PHYSICS DIVISION - 069850 P 26
1963 AND FOR CALENDAR #ENVIRONMENTAL RADIOACTIVITY AT THE SHIPPINGPORT ATOMIC POWER STATION FOR THE SECOND HALF OF 006794 P 3
#VELA UNIFORM, PROJECT SHOAL, POST-SHOT HYDROLOGIC SAFETY, FINAL REPORT.* 053221 P 19
#VELA UNIFORM, PROJECT SHOAL, POST- SHOT HYDROLOGIC SAFETY, FINAL REPORT.* 053221 P 19
#TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961* 013282 P 6
ENTRY PORTION OF PHASE III* #OFF- SITE RADIOLOGICAL SAFETY PROGRAM FOR PROJECT RULISON RE- 079362 P 33
#PROJECT GASBUGGY OFF- SITE RADIOLOGICAL SAFETY REPORT GB-2R PHASE I PROGRAM* 058859 P 20
#TRITIUM IN PRECIPITATION AT CANADIAN SITES (1953-1963).* 054494 P 19
MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES* #TRITIUM 013806 P 10
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.* 053772 P 19
14 AND TRITIUM THROUGHOUT SCANDINAVIA, WITH APPLICATIONS IN SOIL SCIENCE AND HYDROLOGY* #THE OCCURRENCE OF C- 043099 P 16
RADIATION LEVELS AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH THOSE ASSOCIATED WITH NUCLEAR POWER 064889 P 23
#TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES* 013806 P 10
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL UPTAKE* 061130 P 21
#TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES* 013806 P 10
#TRITIUM IN SOUTHERN HEMISPHERE PRECIPITATION (1953-1964).* 054496 P 19
#HASP, SECOND SPECIAL REPORT ON HIGH ALTITUDE SAMPLING PROGRAM.* 052994 P 18
#APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR TOTAL BETA AND ALPHA ASSAY* 070252 P 26
OF TRITIUM IN RAIN, CITY WATER, GROUND WATER AND HOT SPRINGS.* #MEASUREMENT 053240 P 19
PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 AND SR-90* #MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. 020442 P 11
#TRITIUM IN NEW YORK STATE WATERS, 1965* 033090 P 14
TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968-DEC. 1969* #EVALUATION OF 055973 P 19
#TRITIUM IN STREAMS IN THE UNITED STATES, 1961-1968* 057383 P 20
#TRITIUM IN SURFACE WATERS OF THE UNITED STATES, 1966* 027909 P 12
RADIOACTIVITY AT THE SHIPPINGPORT ATOMIC POWER STATION FOR THE SECOND HALF OF 1963 AND FOR CALENDAR YEAR 006794 P 3
MONITORING IN THE OPERATION OF A NUCLEAR POWER STATION* #ENVIRONMENTAL 006924 P 3
TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION* #ENVIRONMENTAL 012287 P 6
STATUS AND PROGRESS REPORT* 013782 P 8
STATUS AND PROGRESS REPORT* 013777 P 7
STATUS AND PROGRESS REPORT* 013778 P 8
STATUS AND PROGRESS REPORT* 009406 P 5
STATUS AND PROGRESS REPORT* 013775 P 7
STATUS AND PROGRESS REPORT* 013781 P 8
STATUS AND PROGRESS REPORT* 013780 P 8
STATUS AND PROGRESS REPORT* 013776 P 7

		# STATUS AND PROGRESS REPORT*	013779 P 8
		# STATUS AND PROGRESS REPORT*	013783 P 9
		# STATUS AND PROGRESS REPORT*	013784 P 9
JULY-DECEMBER 1968*	#RADIOLOGICAL	STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT,	036421 P 19
JAN.-JUNE 1969*	#RADIOLOGICAL	STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT,	042951 P 10
JANUARY-JUNE 1972*	#RADIOLOGICAL	STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT -	082823 P 36
JULY-DEC., 1971*	#RADIOLOGICAL	STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT,	074589 P 30
JULY-DECEMBER 1970*	#RADIOLOGICAL	STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT,	068583 P 29
JANUARY-JUNE 1970*	#RADIOLOGICAL	STATUS OF THE GROUNDWATER BENEATH THE HANFORD PROJECT,	062259 P 21
		# STATUS REPORT NO. 5 ON CLINCH RIVER STUDY*	007082 P 4
AFTER THE	#RADIOCHEMICAL ANALYSIS OF WATER FROM SELECTED	STREAMS AND PRECIPITATION COLLECTED IMMEDIATELY BEFORE AND	070416 P 27
	#TRITIUM IN	STREAMS IN THE UNITED STATES, 1961-1968*	057383 P 20
30, 1970*	#INTERIM SUMMARY OF TRITIUM DATA FOR	STS 'A,' AMCHITKA ISLAND, ALASKA JULY 1, 1969 THRU JUNE	074003 P 29
JUNE 30, 1971*	#AN INTERIM SUMMARY OF TRITIUM DATA FOR	STS 'A', AMCHITKA ISLAND, ALASKA, JULY 1, 1970 THROUGH	079363 P 33
	#ENVIRONMENTAL TRITIUM	STUDIES AT THE NATIONAL REACTOR TESTING STATION*	012287 P 6
PROVING GROUND*	#PRELIM	STUDIES OF PERSISTENCE OF TRITIUM AND C-14 IN PACIFIC	064789 P 23
#RESIDUAL TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA		STUDIES.*	053772 P 19
	#PROBLEMS ARISING IN THE	STUDY OF RADIOACTIVE CONTAMINATION OF THE UPPER ATMOSPHERE*	025597 P 12
ENVIRONMENT*		# STUDY OF TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE	073004 P 28
	#STATUS REPORT NO. 5 ON CLINCH RIVER	STUDY*	007082 P 4
OF BOMB PRODUCED RADIOCARBONS IN THE SURFACE AND		SUBSURFACE WATER OF THE PACIFIC OCEAN.* #MEASUREMENTS	056543 P 20
	#TRITIUM MEASUREMENTS OF	SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES*	013806 P 10
ALASKA JULY 1, 1969 THRU JUNE 30, 1970*	#INTERIM	SUMMARY OF TRITIUM DATA FOR STS 'A,' AMCHITKA ISLAND,	074003 P 29
ALASKA, JULY 1, 1970 THROUGH JUNE 30, 1971*	#AN INTERIM	SUMMARY OF TRITIUM DATA FOR STS 'A', AMCHITKA ISLAND,	079363 P 33
	#FALLOUT PROGRAM QUARTERLY	SUMMARY REPORT*	078012 P 32
#ENVIRONMENTAL MONITORING REPORT - JULY 1967 AND 1967		SUMMARY*	025581 P 12
MONITORING REPORT- JULY - DECEMBER, 1964 AND 1964		SUMMARY* #ENVIRONMENTAL	007462 P 4
MONITORING REPORT. JULY-DECEMBER 1965 AND 1965		SUMMARY* #ENVIRONMENTAL	013345 P 6
MONITORING REPORT. JULY-DECEMBER 1966 AND 1966		SUMMARY* #ENVIRONMENTAL	016978 P 11
MONITORING REPORT - JULY-DECEMBER 1970 AND 1970		SUMMARY* #ENVIRONMENTAL	064210 P 22
MONITORING REPORT - JULY-DECEMBER 1971 AND 1971		SUMMARY* #ENVIRONMENTAL	072141 P 27
MEXICO, AUGUST 1966 THROUGH	#REGIONAL SURVEY OF TRITIUM IN	SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW	081445 P 35
#MEASUREMENTS OF BOMB PRODUCED RADIOCARBONS IN THE		SURFACE AND SUBSURFACE WATER OF THE PACIFIC OCEAN.*	056563 P 20
	#TRITIUM IN	SURFACE WATERS OF THE UNITED STATES, 1966*	027909 P 12
DEC. 1969*	#EVALUATION OF TRITIUM IN GROUND AND	SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968-	055973 P 19
	#TRITIATED MOISTURE IN THE ATMOSPHERE	SURROUNDING A NUCLEAR FUEL REPROCESSING PLANT*	027910 P 13
DEPOSITION, AND OTHER DATA*		# SURVEILLANCE DATA FOR MILK AND FOOD, WATER, AIR AND	064274 P 22
	#ENVIRONMENTAL	SURVEILLANCE FOR PROJECT GASBUGGY PRODUCTION TEST PHASE*	056139 P 19
	#ENVIRONMENTAL	SURVEILLANCE OF THE CRYSTAL RIVER NUCLEAR POWER PLANT*	065092 P 23
	#AN ECOLOGICAL APPROACH TO ENVIRONMENTAL	SURVEILLANCE*	065109 P 24
JANUARY THROUGH JUNE 1969*		# SURVEY OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER FOR	039936 P 16
		# SURVEY OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER*	067332 P 25
		# SURVEY OF ENVIRONMENTAL REACTIVITY*	032834 P 14
1968T1969)*	#ENVIRONMENTAL ISOTOPE DATA NO. 4: WORLD	SURVEY OF ISOTOPE CONCENTRATION IN PRECIPITATION (	088469 P 36
ALAMOS AREA, NEW MEXICO, AUGUST 1966 THROUGH MAY	#REGIONAL	SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS	081445 P 35
	#A SAMPLING	SYSTEM FOR ATMOSPHERIC HT AND HTO*	094616 P 36
	#ELK RIVER REACTOR	SYSTEM MONITORING DATA*	016929 P 10
	#SAMPLING AND ANALYTICAL	SYSTEMS FOR MEASURING ENVIRONMENTAL RADIOACTIVITY*	070255 P 27

GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING		TECHNIQUE* #TRITIUM CONCENTRATION OF	013347 P 6
GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING		TECHNIQUE* #TRITIUM CONCENTRATION OF	013795 P 9
	#ENVIRONMENTAL MONITORING	TECHNIQUES*	082302 P 35
1964*	#CHEMICAL EFFLUENTS	TECHNOLOGY WASTE DISPOSAL INVESTIGATIONS JANUARY-DECEMBER,	007122 P 4
	#RADIOACTIVITY IN WATER, CENTRAL NEVADA	TEST AREA*	075733 P 31
	IMMEDIATELY BEFORE AND AFTER THE SECOND PRODUCTION-	TEST FLARING, PROJECT RULISON* AND PRECIPITATION COLLECTED	070416 P 27
#ENVIRONMENTAL SURVEILLANCE FOR PROJECT GASBUGGY PRODUCTION		TEST PHASE*	056139 P 19
#ENVIRONMENTAL TRITIUM STUDIES AT THE NATIONAL REACTOR		TESTING STATION*	012287 P 6
FINAL OPERATIONAL RADIOACTIVITY REPORT (ON THE) PRODUCTION		TESTS* #PROJECT RULISON	031269 P 14
#PROJECT RULISON FINAL OPERATIONAL RADIOACTIVITY REPORT (ON		THE) PRODUCTION TESTS*	031269 P 14
	#NUCLEAR SAFETY PROJECT -	THIRD PROJECT REPORT/FIRST HALF OF 1973*	092023 P 36
AT BROOKHAVEN NATIONAL LABORATORY AND SOME COMPARISONS WITH		THOSE ASSOCIATED WITH NUCLEAR POWER REACTOR PLANTS* LEVELS	064889 P 23
ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JULY		THROUGH DECEMBER 1963.*#EFFECT OF THE SAVANNAH RIVER PLANT	051297 P 18
THE VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY, JULY		THROUGH DECEMBER 1971* #ENVIRONMENTAL MONITORING IN	075960 P 31
THE VICINITY OF THE LAWRENCE LIVERMORE LABORATORY, JANUARY		THROUGH DECEMBER, 1971* LEVELS OF RADIOACTIVITY IN	073660 P 28
ON ENVIRONMENTAL RADIOACTIVITY. SEMIANNUAL REPORT JANUARY		THROUGH JUNE 1966* #EFFECT OF THE SAVANNAH RIVER PLANT	013618 P 7
OF ENVIRONMENTAL RADIOACTIVITY AT ELK RIVER FOR JANUARY		THROUGH JUNE 1969* #SURVEY	039936 P 16
VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY, JANUARY		THROUGH JUNE 1971* #ENVIRONMENTAL MONITORING IN THE	034486 P 15
THE VICINITY OF THE LAWRENCE LIVERMORE LABORATORY - JANUARY		THROUGH JUNE 1971*ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN	066047 P 24
DATA FOR STS 'A', AMCHITKA ISLAND, ALASKA, JULY 1, 1970		THROUGH JUNE 30, 1971* #AN INTERIM SUMMARY OF TRITIUM	079363 P 33
#ENVIRONMENTAL MONITORING SEMI-ANNUAL REPORT- JANUARY		THROUGH JUNE, 1964*	004695 P 1
WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966		THROUGH MAY 1969* SURVEY OF TRITIUM IN SURFACE AND GROUND	081445 P 35
#INDEX TO HAZARDS CONTROL QUARTERLY REPORTS, NOS. 1		THROUGH 19*	007430 P 4
AND HYDROLOGY*	#THE OCCURRENCE OF C-14 AND TRITIUM	THROUGHOUT SCANDINAVIA, WITH APPLICATIONS IN SOIL SCIENCE	043099 P 16
DATA FOR STS 'A,' AMCHITKA ISLAND, ALASKA JULY 1, 1969		THRU JUNE 30, 1970* #INTERIM SUMMARY OF TRITIUM	074003 P 29
#APPLICATION OF LIQUID SCINTILLATION SPECTROMETRY FOR		TOTAL BETA AND ALPHA ASSAY*	070252 P 26
SAMPLES	#RADIOBIOASSAY PROGRAM OF THE INSTITUTIONAL	TOTAL DIET SAMPLING NETWORK: I ANALYTICAL DATA RELATED TO	074298 P 29
		# TRENDS IN THE GLOBAL DISTRIBUTION OF TRITIUM SINCE 1961*	013282 P 6
	#STUDY OF	TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT*	073004 P 28
FUEL REPROCESSING PLANT*		# TRITIATED MOISTURE IN THE ATMOSPHERE SURROUNDING A NUCLEAR	027910 P 13
CHARACTERISTICS OF GLOBAL FALLOUT OF H-3	#MEASUREMENT OF	TRITIUM ACTIVITY IN NATURAL WATERS. PART II.	020442 P 11
	#PRELIM STUDIES OF PERSISTENCE OF	TRITIUM AND C-14 IN PACIFIC PROVING GROUND*	064789 P 23
	#NEW	TRITIUM AND DEUTERIUM MEASUREMENTS IN ATMOSPHERIC HYDROGEN*	013799 P 10
		# TRITIUM ANOMALIES ON AMCHITKA ISLAND, ALASKA. PART I*	073928 P 28
		# TRITIUM ANOMALIES ON AMCHITKA ISLAND, ALASKA. PART II*	072581 P 28
	#RESIDUAL	TRITIUM AT SEDAN CRATER. PART II. SOIL AND EJECTA STUDIES.*	053772 P 19

	# TRITIUM BURDENS IN TWO ARCTIC VILLAGES*	081022 P 34
	# TRITIUM CONCENTRATION IN PRECIPITATION, 1967-1968*	044669 P 17
WATER. LIST NO. 1*	# TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER	051272 P 18
THE PROPORTIONAL-COUNTING TECHNIQUE*	# TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH	013795 P 9
THE PROPORTIONAL-COUNTING TECHNIQUE*	# TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH	013347 P 6
	# TRITIUM CONCENTRATIONS IN FOOD, 1967-1968*	045385 P 18
	# TRITIUM CONCENTRATIONS IN FOOD, 1967-1968*	056180 P 19
	# TRITIUM CONTAMINATION OF THE ENVIRONMENT*	075312 P 30
#THE CURRENT	TRITIUM CONTENTS OF NATURAL WATERS*	061936 P 21
1969 THRU JUNE 30, 1970* #INTERIM SUMMARY OF	TRITIUM DATA FOR STS 'A,' AMCHITKA ISLAND, ALASKA JULY 1,	074003 P 29
1970 THROUGH JUNE 30, 1971* #AN INTERIM SUMMARY OF	TRITIUM DATA FOR STS 'A', AMCHITKA ISLAND, ALASKA, JULY 1,	079363 P 33
#NEW DOSE ESTIMATES FROM CHRONIC	TRITIUM EXPOSURES*	023261 P 12
#CONTROLLING	TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS*	027977 P 13
#CONTROL OF	TRITIUM HEALTH HAZARDS AT THE SAVANNAH RIVER PLANT*	064768 P 22
#MONITORING OF	TRITIUM IN GASES, LIQUIDS, AND IN THE ENVIRONMENT*	065252 P 24
STATES, APRIL 1968-DEC. 1969* #EVALUATION OF	TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED	055973 P 19
	# TRITIUM IN NEW YORK STATE WATERS, 1965*	033090 P 14
	# TRITIUM IN PRECIPITATION AT CANADIAN SITES (1953-1963).*	054494 P 19
#MEASUREMENT OF	TRITIUM IN RAIN, CITY WATER, GROUND WATER AND HOT SPRINGS.*	053240 P 19
#NATURAL CONCENTRATION OF KRYPTON-85, CARBON-14, AND	TRITIUM IN RECENT YEARS*	043102 P 17
	# TRITIUM IN SOUTHERN HEMISPHERE PRECIPITATION (1953-1964).*	054496 P 19
	# TRITIUM IN STREAMS IN THE UNITED STATES, 1961-1968*	057383 P 20
AREA, NEW MEXICO, AUGUST 1966 THROUGH #REGIONAL SURVEY OF	TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS	081445 P 35
	# TRITIUM IN SURFACE WATERS OF THE UNITED STATES, 1966*	027909 P 12
	# TRITIUM IN THE GROUNDWATER IN JAPAN*	079785 P 34
#RADIOCARBON AND	TRITIUM IN THE UPPER TROPOSPHERE*	013797 P 9
TRITIUM MEASUREMENTS IN NATURE. A REVIEW OF THE WORK OF THE	TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, NEW	051441 P 18
THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, NEW #	TRITIUM MEASUREMENTS IN NATURE. A REVIEW OF THE WORK OF	051441 P 18
AFRICAN SITES*	# TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH	013806 P 10
#HEALTH PHYSICS ASPECTS OF LRL	TRITIUM RELEASE*	067941 P 25
#TRENDS IN THE GLOBAL DISTRIBUTION OF	TRITIUM SINCE 1961*	013282 P 6
#ENVIRONMENTAL	TRITIUM STUDIES AT THE NATIONAL REACTOR TESTING STATION*	012287 P 6
SCIENCE AND HYDROLOGY* #THE OCCURRENCE OF C-14 AND	TRITIUM THROUGHOUT SCANDINAVIA, WITH APPLICATIONS IN SOIL	043099 P 16
PLANT* #OBSERVATION OF AIRBORNE	TRITIUM WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING	080212 P 34
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND	TRITIUM*	008306 P 5
#ANALYSES OF ENVIRONMENTAL SAMPLES FOR CARBON-14 AND	TRITIUM*	064785 P 22
#MONITORING, CONTROL, AND DISPOSAL OF	TRITIUM. A SELECTED BIBLIOGRAPHY*	082225 P 35
#RADIOCARBON AND TRITIUM IN THE UPPER	TROPOSPHERE*	013797 P 9
#TRITIUM BURDENS IN	TWO ARCTIC VILLAGES*	081022 P 34

REPORT.* #VELA	UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY. FINAL	053221 P 19
OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN	UNITED STATES, APRIL 1968-DEC. 1969* #EVALUATION	055973 P 19
#TRITIUM IN STREAMS IN THE	UNITED STATES, 1961-1968*	057383 P 20
#TRITIUM IN SURFACE WATERS OF THE	UNITED STATES, 1966*	027909 P 12
ARISING IN THE STUDY OF RADIOACTIVE CONTAMINATION OF THE	UPPER ATMOSPHERE* #PROBLEMS	025597 P 12
#RADIOCARBON AND TRITIUM IN THE	UPPER TROPOSPHERE*	013797 P 9
#RADIOACTIVE FALLOUT OVER SOUTH AFRICA AND ITS BIOLOGICAL	UPTAKE*	061130 P 21
#PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1968 TO THE	USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME II.	036537 P 15

#RADIOLOGICAL HEALTH DATA, VOLUME	V, NUMBER 3*	005154 P 2
#RADIOLOGICAL HEALTH DATA, VOLUME	V, NUMBER 4*	005183 P 3
#RADIOLOGICAL HEALTH DATA, VOLUME	V, NUMBER 8*	005170 P 2
#RADIOLOGICAL HEALTH DATA, VOLUME	V, NUMBER 9*	005171 P 2
FINAL REPORT.* #	VELA UNIFORM, PROJECT SHOAL. POST-SHOT HYDROLOGIC SAFETY.	053221 P 19
#EVALUATION OF RADIOLOGICAL CONDITIONS IN THE	VICINITY OF HANFORD FOR 1965*	015959 P 10
REPORT OF ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE	VICINITY OF THE LAWRENCE LIVERMORE LABORATORY - JANUARY	066047 P 24
ANNUAL REPORT*#ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE	VICINITY OF THE LAWRENCE LIVERMORE LABORATORY - 1972	074335 P 29
THROUGH #ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE	VICINITY OF THE LAWRENCE LIVERMORE LABORATORY, JANUARY	073660 P 28
#ENVIRONMENTAL MONITORING IN THE	VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY*	074865 P 30
THROUGH JUNE 1971* #ENVIRONMENTAL MONITORING IN THE	VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY, JANUARY	034486 P 15
THROUGH DECEMBER 1971* #ENVIRONMENTAL MONITORING IN THE	VICINITY OF THE LOS ALAMOS SCIENTIFIC LABORATORY, JULY	075960 P 31
#TRITIUM BURDENS IN TWO ARCTIC	VILLAGES*	081022 P 34
FOR 1968 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE.	VOLUME II. PHYSICAL SCIENCES. PART. III. INSTRUMENTATION*	036537 P 15
#RADIOLOGICAL HEALTH DATA,	VOLUME IV, NUMBER 3*	005143 P 1
#RADIOLOGICAL HEALTH DATA,	VOLUME IV, NUMBER 5*	005145 P 1
#RADIOLOGICAL HEALTH DATA,	VOLUME IV, NUMBER 8*	005148 P 2
#RADIOLOGICAL HEALTH DATA,	VOLUME V, NUMBER 3*	005154 P 2
#RADIOLOGICAL HEALTH DATA,	VOLUME V, NUMBER 4*	005183 P 3
#RADIOLOGICAL HEALTH DATA,	VOLUME V, NUMBER 8*	005170 P 2
#RADIOLOGICAL HEALTH DATA,	VOLUME V, NUMBER 9*	005171 P 2

#OBSERVATION OF AIRBORNE TRITIUM	WASTE DISCHARGE FROM A NUCLEAR FUEL REPROCESSING PLANT*	080212 P 34
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT	WASTE DISPOSAL FACILITIES.*	051305 P 18
#RADIONUCLIDES IN GROUNDWATER AT THE SAVANNAH RIVER PLANT	WASTE DISPOSAL FACILITIES*	043090 P 16
#CHEMICAL EFFLUENTS TECHNOLOGY	WASTE DISPOSAL INVESTIGATIONS JANUARY-DECEMBER, 1964*	007122 P 4
#RADIOACTIVITY IN	WATER - PROJECT MILROW*	044832 P 17
#SECTION II -	WATER - RADIOLOGICAL HEALTH DATA REPORTS*	029905 P 13
JULY 1972* #RADIOCHEMICAL MONITORING OF	WATER AFTER THE CANNIKEN EVENT, AMCHITKA ISLAND, ALASKA,	074859 P 30
#MEASUREMENT OF TRITIUM IN RAIN, CITY WATER, GROUND	WATER AND HOT SPRINGS.*	053240 P 19

#RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT, JAN.-JUNE 1969* 042951 P 16
#RADIOLOGICAL STATUS OF THE GROUND WATER BENEATH THE HANFORD PROJECT, JULY-DECEMBER 1968* 036421 P 15
IMMEDIATELY BEFORE AND AFTER THE #RADIOCHEMICAL ANALYSIS OF WATER FROM SELECTED STREAMS AND PRECIPITATION COLLECTED 070416 P 27
THROUGH #REGIONAL SURVEY OF TRITIUM IN SURFACE AND GROUND WATER IN THE LOS ALAMOS AREA, NEW MEXICO, AUGUST 1966 081445 P 35
#CONTROLLING TRITIUM HAZARDS AROUND HEAVY WATER MODERATED REACTORS* 027977 P 13
OF BOMB PRODUCED RADIOCARBONS IN THE SURFACE AND SUBSURFACE WATER OF THE PACIFIC OCEAN.* #MEASUREMENTS 056543 P 20
#SECTION II. WATER* 030360 P 13
#TRITIUM CONCENTRATION IN RAIN, RIVERS, OCEANS AND OTHER WATER. LIST NO. 1* 051272 P 18
#SURVEILLANCE DATA FOR MILK AND FOOD. WATER, AIR AND DEPOSITION, AND OTHER DATA* 064276 P 22
#RADIATION DATA, MILK AND FOOD. WATER, AIR AND DEPOSITION, AND OTHER DATA* 081023 P 35
#RADIOACTIVITY IN WATER, CENTRAL NEVADA TEST AREA* 079739 P 31
#MEASUREMENT OF TRITIUM IN RAIN, CITY WATER, GROUND WATER AND HOT SPRINGS.* 053240 P 19
#FATE OF RADIOACTIVE CONTAMINANTS IN WATER, PROGRESS REPORT NO. 2* 004811 P 1
#THE MEASUREMENT OF HYDROGEN AND OXYGEN ISOTOPES IN NATURAL WATERS AND ITS APPLICATION TO METEOROLOGY AND HYDROLOGY. 028116 P 13
#TRITIUM MEASUREMENTS OF SUBTERRANEAN WATERS IN SOME SOUTH AFRICAN SITES* 013806 P 10
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013795 P 9
#TRITIUM CONCENTRATION OF GERMAN RIVER WATERS MEASURED WITH THE PROPORTIONAL-COUNTING TECHNIQUE* 013347 P 6
#TRITIUM IN SURFACE WATERS OF THE UNITED STATES, 1966* 027909 P 12
#EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968-DEC. 1969* 055973 P 19
#THE CURRENT TRITIUM CONTENTS OF NATURAL WATERS* 061936 P 21
AND SR-90* #MEASUREMENT OF TRITIUM ACTIVITY IN NATURAL WATERS. PART II. CHARACTERISTICS OF GLOBAL FALLOUT OF H-3 020442 P 11
#TRITIUM IN NEW YORK STATE WATERS, 1965* 033090 P 14
#EVALUATION OF TRITIUM IN GROUND AND SURFACE WATERS OF THE WESTERN UNITED STATES, APRIL 1968-DEC. 1969* 055973 P 19
FEBRUARY 28, 1962* #REPORT ON THE WORK OF THE INSTITUTE OF NUCLEAR SCIENCES, MARCH 1, 1961 - 009511 P 5
SCIENCES, #TRITIUM MEASUREMENTS IN NATURE. A REVIEW OF THE WORK OF THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR 051441 P 18
1968T1969)* #ENVIRONMENTAL ISOTOPE DATA NO. 4: WORLD SURVEY OF ISOTOPE CONCENTRATION IN PRECIPITATION (088469 P 36

POWER STATION FOR THE SECOND HALF OF 1963 AND FOR CALENDAR YEAR 1963* RADIOACTIVITY AT THE SHIPPINGPORT ATOMIC 006794 P 3
#ANNUAL ENVIRONMENTAL MONITORING REPORT: CALENDAR YEAR 1972* 074531 P 29
OF KRYPTON-85, CARBON-14, AND TRITIUM IN RECENT YEARS* #NATURAL CONCENTRATION 043102 P 17
#TRITIUM IN NEW YORK STATE WATERS, 1965* 033090 P 14

THE TRITIUM LABORATORY, INSTITUTE OF NUCLEAR SCIENCES, NEW ZEALAND.* MEASUREMENTS IN NATURE. A REVIEW OF THE WORK OF 051441 P 18

X Non-Compliance and Accident Reports

X - NON-COMPLIANCE AND ACCIDENT REPORTS

007703
BECKETT EF
REFUELING AND REPAIRS OF THE PM-3A DURING THE 1964-65 AUSTRAL SUMMER
NEW YORK OPERATIONS OFFICE, U. S. ATOMIC ENERGY COMMISSION
NYO-10736 *. 49 PAGES, 19 FIGURES, 2 TABLES, 11 REFERENCES, AMERICAN NUCLEAR SOCIETY CONFERENCE ON REACTOR OPERATING EXPERIENCE, JACKSON LAKE LODGE, WYOMING, JULY 28-29, 1965, ANS TRANSACTIONS, SUPPLEMENT TO VOLUME 8, PAGE 3

ONE HUNDRED AND FORTY DAYS WERE REQUIRED - 13 FOR REFUELING AND 127 FOR MAINTENANCE AND TESTING. WORKERS WERE ABLE TO USE STUD TENSIONERS DIRECTLY WITHOUT REMOTE MANIPULATION ON HEAD REMOVAL BUT WERE JAMMED DURING HEAT REPLACEMENT BECAUSE THE STUD-OPERATING NUT ROTATES OPPOSITE TO THE STUD NUT. CONTROL-ROD-DRIVE COLLETS HAD DEFORMED AND WERE REPLACED. ROD-DRIVE ACTUATORS FAILED (WHEN USED IN GROUPS) BECAUSE OF EXCESSIVE CURRENT DEMAND. THREE HAD INTERNAL SHORTS IN THE COILS BECAUSE OF INTERNAL WIRE MOVEMENT LOOSENING THE POTTING, AND MOISTURE INLEAKAGE THROUGH POOR CABLE BONDS AND CONNECTORS. ON STARTUP, A STEAM-GENERATOR WATER-LEVEL INDICATOR MALFUNCTIONED, AND THE SHELL WAS RUN DRY. MUCH TIME WAS LOST BECAUSE PROCUREMENT AND ENGINEERING EVALUATION WERE DONE OFF-SITE.

FAILURE, EQUIPMENT + *MAINTENANCE AND REPAIR + REACTOR, PWR + *OPERATING EXPERIENCE SUMMARY + *REFUELING + PM 3A (PWR) + REACTOR, MILITARY

008009
INADEQUATE RADIATION CONTROL, TR SCHWALM, INC., LANCASTER, PA.
SCHWALM (THEODORE R.) INC.
2 PAGES- AUGUST 27, 1965, ATOMIC ENERGY CLEARING HOUSE 11(43)- 29-30 (OCTOBER 25, 1965)- POR

A LETTER FROM DSLR INDICATES STACK DISCHARGES MAY BE ABOVE LIMITS, CONTAMINATION SURVEYS IMPROPERLY OR NOT DONE, LOW AIR FLOW IN FUME HOODS, HAND CONTAMINATIONS AFTER WASH WAS AS HIGH AS 56,000 D/M, PROTECTIVE GLOVES NOT USED ROUTINELY, RESURVEYS NOT MADE FOLLOWING DECONTAMINATION.

*ADMINISTRATIVE CONTROL + SOURCE, RADIATION + RADIATION SAFETY AND CONTROL + FAILURE, MAINTENANCE ERROR

010376
AEC ASKED TO REVIEW CORRECTIVE ACTIONS PROPOSED BY DIAL-PAINTING FACILITY
U.S. RADIUM CORPORATION, NEW JERSEY
50 PAGES, LETTER - U.S. RADIUM CORPORATION TO DIVISION OF COMPLIANCE (AEC) - APRIL 30, 1968

WE REQUEST YOUR CONSIDERATION OF THE FOLLOWING MAJOR ITEMS OF GENERAL APPLICABILITY - (ITEMS 1 AND 2) OUR EVALUATION OF THE PROBLEM OF STACK LOSSES TO UNRESTRICTED AREAS AND OUR RECTIFICATION OF AND REALIGNMENT OF RESTRICTED AREAS, AS SUGGESTED BY OUR HEALTH PHYSICS CONSULTANT. BASED UPON THE RELOCATION OF OUR PROPOSED DIAL PAINTING FACILITY AND CONSIDERING THE MEASUREMENTS WE HAVE MADE DURING THE PAST 6 TO 8 MONTHS RELATIVE TO THE CONTRIBUTION TO THE TOTAL PROBLEM OF EACH OF THE MAJOR AREAS OF EFFLUENT RELEASE, WE BELIEVE THIS REALIGNMENT OF RESTRICTED AREA WILL COMPLETELY ELIMINATE THIS PROBLEM OF SUSPECTED NON-COMPLIANCE. (ITEM 3) OUR REVISION OF SOP TO BRING IN LINE WITH STANDARD AND GENERALLY ACCEPTED VALUES THE MAXIMUM PERMISSIBLE LEVELS OF CONTAMINATION WE PROPOSE TO ADHERE TO IN ALL APPLICABLE AREAS AND FOR ALL TYPES OF CONTAMINATION. (ITEM 3) TRITIUM CONTAMINATION MEASUREMENTS WILL, IN THE FUTURE, BE MADE BY LIQUID SCINTILLATION COUNTING RATHER THAN BY INTERNAL GAS FLOW COUNTER.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION

010408
DISAPPEARANCE OF RADIOACTIVE MATERIAL FROM KELLY AIR FORCE BASE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO
3 PAGES, LETTER - DEPARTMENT OF THE AIR FORCE, WRIGHT-PATTERSON AFB, TO DIVISION OF COMPLIANCE (AEC) - APRIL 11, 1968

REPORTS LOSS, PROBABLY IN SHIPPING OF 53 LENSATIC COMPASSES (TRITIATED).

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + *COMPLIANCE + *SOURCE, RADIATION, LOST

010640
DIVISION OF COMPLIANCE CITES COMPANY FOR UNAUTHORIZED POSSESSION OF TRITIUM
U. S. ATOMIC ENERGY COMMISSISON, DIVISION OF COMPLIANCE
2 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO SCHENLEY DISTILLERS, INC. - MAY 1, 1968

BASED ON INFORMATION FURNSIHED ON APRIL 11, 1968, IT APPEARS THAT SCHENLEY DISTILLERS, INC., POSSESSED ON THAT DATE A 250-MILLICURIE TRITIUM GAS CHROMATOGRAPH WITHOUT A VALID AEC LICENSE. ADDITIONALLY, THE TRITIUM GAS CHROMATOGRAPH WAS TRANSFERRED TO THE PLANT IN LAWRENCEBURG, INDIANA. ACCORDING TO OUR RECORDS, SCHENLEY DISTILLERS, INC. HOLDS NO VALID LICENSE WHICH WOULD AUTHORIZE POSSESSION AND USE OF THE BYPRODUCT MATERIAL IN QUESTION AT LAWRENCEBURG, INDIANA.IF THE INTENTION IS TO POSSESS AND USE THIS MATERIAL AT LAWRENCEBURG IT WILL BE NECESSARY THAT AN

010640 *CONTINUED*
APPLICATION FOR AN APPROPRIATE LICENSE BE FILED WITH THE COMMISSION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*LICENSE STATUS + *COMPLIANCE

010831
TRACE LIQUID RADIOACTIVE WASTE (TRITIUM) TO DUMP
UNIVERSITY OF MISSOURI, COLUMBIA
3 PAGES, LETTER - UNIVERSITY OF MISSOURI TO DIVISION OF COMPLIANCE (AEC) - SEPTEMBER 5, 1970

TECHNICIAN TELEPHONED TO ASK IF A REPRESENTATIVE OF THE RADIATION SAFETY OFFICE HAD PICKED UP THE CONTENTS OF HER 28-GALLON RADIOACTIVE-WASTE CONTAINER. IT HAD BEEN FULL AND SHE WAS GOING TO REQUEST THAT IT BE EMPTIED, BUT WHEN SHE CHECKED THAT MORNING SHE FOUND IT EMPTY. A NEW JANITOR, WHO HAD BEEN INSTRUCTED NOT TO EMPTY THE PLAINLY MARKED YELLOW DRUMS, HAD EMPTIED THIS ONE THE NIGHT BEFORE. ON REGULAR SCHEDULE, THE CONTENTS LEFT THE MEDICAL CENTER WITH A ROUTINE TRASH REMOVAL AT APPROXIMATELY NOON ON FRIDAY TO BE DELIVERED TO THE DUMP OPERATED BY THE CITY OF COLUMBIA. FOUND THAT THE TREATMENT OF THE TRASH HAD BEEN CHANGED. INSTEAD OF BURNING, THE TRASH WAS BEING COMPACTED AND COVERED BY 3-FEET OF DIRT. BECAUSE THE TRASH WAS NOT BURNED, IT WAS CONSIDERED INAPPROPRIATE TO OBTAIN A BIOASSAY FOR EITHER OF THE TWO EQUIPMENT OPERATORS. BECAUSE THE TRASH FROM THE MEDICAL CENTER HAD ALREADY BEEN BURIED, NO ATTEMPT WAS MADE TO RECOVER IT. IT IS LIKELY, HOWEVER, THAT WE WILL FIND THAT 1 MCI OR LESS WAS THE QUANTITY ACTUALLY LOST.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FAILURE, OPERATOR ERROR + REACTOR, RESEARCH + BYPRODUCT MATERIAL + *COMPLIANCE + *WASTE DISPOSAL, LIQUID + COLLEGES AND UNIVERSITIES

011788
JOHNSON RM
NORTHWESTERN UNIVERSITY TRITIUM SOURCE LOSS
NORTHWESTERN UNIVERSITY
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(40), PAGES 18-19 (OCTOBER 4, 1966)

A 2.6-CURIE TRITIUM SOURCE TO BE USED AS AN ACCELERATOR TARGET WAS DISCOVERED MISSING IN AUGUST 1966. IN MAY 1965, THE SOURCE HAD BEEN REMOVED FROM THE SHIPPING CONTAINER, USED IN A TRIAL RUN OF THE ACCELERATOR (BEFORE COMPLETION OF THE EXPERIMENT CHAMBER), AND STORED IN AN ORANGE-JUICE CAN IN A LEAD-LINED CONTAINER BEHIND A WORKBENCH. APPARENTLY, CONSTRUCTION WORKERS HAD THROWN IT OUT.

FAILURE, OPERATOR ERROR + *SOURCE, RADIATION, LOST + FAILURE, ADMINISTRATIVE CONTROL + ACCELERATOR

011949
NEW ENGLAND NUCLEAR CORPORATION CITED FOR NONCOMPLIANCE, AUGUST 8, 1966
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(42), PAGE 15 (OCTOBER 17, 1966)

VARIOUS ADMINISTRATIVE FAILINGS DESCRIBED, INCLUDING FAILURE TO TRACE CAUSES OF HIGH TRITIUM CONTENT IN URINE, DISCHARGING 4.2 CURIES OF TRITIUM TO SEWER SYSTEM, AND CONSISTENTLY INADEQUATE EVALUATION OF AMOUNT OF RADIOACTIVE WASTE RELEASED TO SEWERS.

*COMPLIANCE + SURVEY, RADIATION + *WASTE DISPOSAL, LIQUID

013446
KILLIAN CB
TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(50), PAGES 20-21 (DECEMBER 12, 1966)

(1) DURING THREE WEEKS IN EARLY OCTOBER 1966, A TECHNICIAN RECEIVED 0.4 REM INTERNAL EXPOSURE FROM TRITIUM DUE TO INADEQUATE AIR VELOCITY IN HOOD. THE RADIOLOGICAL SAFETY TECHNICIAN WILL NOW MEASURE AIR VELOCITY DURING ANY OPERATIONAL SURVEY. (2) DURING LATE OCTOBER, A JUNIOR CHEMIST RECEIVED AN INTERNAL TRITIUM EXPOSURE DUE TO IMPROPER DECONTAMINATION OF A VACUUM LINE BECAUSE HIS SUPERVISOR FAILED TO REVIEW THE OPERATION.

*PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + FAILURE, ADMINISTRATIVE CONTROL

014861
N S SAVANNAH CHANGE 5 - MISC. ADMINISTRATION AND TESTING
DIVISION OF REACTOR LICENSING, UNITED STATES ATOMIC ENERGY COMMISSION
9 PAGES, FEBRUARY 5, 1967, DOCKET NO. 50-238

CHANGES ALLOWED ARE - (1) CHANGE IN ORGANIZATIONAL TITLES, (2) PROVIDE FOR TRITIUM MONITORING IN

014861 *CONTINUED*
WASTE DISPOSAL, (3) LESS FREQUENT EVACUATION DRILLS, (4) CLARIFY REPORTING RESPONSIBILITY OF STAFF HEALTH PHYSICIST, (5) ALTER CHANNEL 10 AND 11 REQUIREMENTS OF RADIATION MONITORING DURING FILTER TESTS, AND (6) ALLOW PORT ENTRY IF A DOP TEST WITHIN 1 WEEK PAST SHOWED A FILTER FACTOR OF 1000 OR MORE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

ADMINIS' 'TIVE CONTROL + REACTOR, MARITIME + NS SAVANNAH (PWR) + REACTOR, PWR + WASTE DISPOSAL + TEST, DOP FILTE' CONTAINMENT FILTERING SYSTEM + *TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + RADIATION MONITORS

015010
MIT REACTOR HEAT EXCHANGER LEAK, FEBRUARY 21-23, 1967
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(10), PAGE 24 (MARCH 6, 1967) DOCKET NO. 50-20

(LETTER, FEBRUARY 27) 15 GA OF D2O (TRITIUM CONCENTRATION 1.3 MILLICURIES/CC) REACHED THE 20,000-GAL H2O SECONDARY SYSTEM. SOME CONTAMINATED SECONDARY WATER WAS RELEASED. THE HEAT EXCHANGER WILL BE FIXED. PERMISSION ASKED TO DISCHARGE SECONDARY WATER AT 5 GPM INTO SANITARY SEWER AND CHARLES RIVER.

EFFLUENT + REACTOR, HWR + *FAILURE, PIPE + REACTOR, RESEARCH + WASTE DISPOSAL, RIVER + *INCIDENT, EQUIPMENT

015085
U.S. RADIUM CORPORATION TRITIUM LEAK AND STACK-DISCHARGE
U.S. RADIUM CORPORATION
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGES 36-37, (MARCH 13, 1967)

U.S. RADIUM CORP. REPORTS JAN. 31 TWO INCIDENTS. (1) JAN. 10. DURING FILLING OF GAS TUBES, SOLUBLE TRITIUM WAS MONITORED AT STACK AS 30.65 X MPC AND 763.3 X MPC. THIS IS BELIEVED DUE TO FLUSHING GAS TRAPPED IN PUMP OIL. (2) JAN. 20. DURING A REPAIR OF A GAS-FILLING TUBE, 76 CURIES WAS LOST, GIVING STACK DISCHARGE AS EITHER 9.05 X MPC (USING SUBMERSIBLE MPC) OR 1810 X MPC (USING SOLUBLE MPC). STACK WAS NOT BEING MONITORED THAT DAY.

EFFLUENT + MONITOR, STACK + STACK + *INCIDENT, EQUIPMENT

015289
EHHALT DH + BAINBRIDGE AE
A PEAK IN THE TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN FOLLOWING THE ACCIDENT AT WINDSCALE
NATIONAL CENTER FOR ATMOSPHERIC RESEARCH, BOULDER, COLORADO
2 PAGES, 1 FIGURE, NATURE, 209(5026), PAGES 903-904, (FEBRUARY 26, 1966)

A PEAK IN THE TRITIUM CONTENT OF SURFACE AIR DURING OCTOBER 1957 WAS ATTRIBUTED TO THE WINDSCALE INCIDENT. THE TOTAL TRITIUM RELEASED CANNOT BE ESTIMATED, BUT SINCE THE CONCENTRATION RETURNED TO ITS FORMER VALUE WITHIN EIGHT DAYS IT COULD NOT HAVE CONTRIBUTED SIGNIFICANTLY TO THE GLOBAL INVENTORY.

*INCIDENT, WINDSCALE

015311
BURTSAVAGE EM
US RADIUM CORP. LISTS 87 TRITIUM RELEASES JULY - DECEMBER 1966
U.S. RADIUM CORP., BLOOMSBURG, PA.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(13), PAGES 32-33, (MARCH 27, 1967)

U.S. RADIUM REPORTS (FEB. 17, 1967) 51 RELEASES OF TRITIUM (TO UNRESTRICTED AREAS) IN EXCESS OF MPC, AND 36 RELEASES OF TRITIUM (TO UNRESTRICTED AREAS) OF 10 TIMES THE LICENSED LIMITS. ALL WERE STACK DISCHARGES OF HTO FROM FOUR FACILITIES, CAUSED BY VARIOUS LEAKS.

*AIRBORNE RELEASE + EFFLUENT + *STACK

015996
YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 71
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON
10 PAGES, 2 FIGURES, 1 TABLE, DECEMBER 21, 1966, DOCKET NO. 50-29

THE MAIN COOLING SYSTEM WAS HEATED TO 400 F AT 550 PSIG AND ALLOWED TO SOAK FOR 24 HOURS TO ALLOW COMPLETE EFFUSION OF HYDROGEN FROM THE REACTOR VESSEL BEFORE TAKING THE REACTOR CRITICAL. A LEAK FROM THE PRIMARY TO THE SECONDARY SYSTEM WAS DETERMINED TO BE 34 GAL/DAY BY USING TRITIUM AS A TRACER.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

HYDROGEN + *REPORT, OPERATIONS + REACTOR, PWR + TEST, LEAK RATE + YANKEE ROWE (PWR) + REACTOR, POWER + OPERATING EXPERIENCE SUMMARY + TRACER + OFF GAS + MAIN COOLING SYSTEM

C16404
SELECTED YANKEE OPERATING EXPERIENCE.
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASSACHUSETTS
8 PAGES, 2 FIGURES, 1 TABLE, MAY 24, 1967, DOCKET NO. 50-79, FROM YANKEE NUCLEAR POWER STATION OPERATIONS REPORT NO. 76 FOR THE MONTH OF APRIL 1967

(1) CORE REACTIVITY CONTINUES NORMALLY AT 0.74 DELTA K/K PER 1000 MWD/MT. (2) INCREASING NO.-1 STEAM-GENERATOR CHLORIDE LEVEL WAS TRACED TO CHLORIDE CONTAMINATION OF THE PHOSPHATE ADDITIVE, AS OTHER INDICATORS OF TURBINE-CONDENSER TUBE LEAKS WERE ABSENT. (3) AN ACCIDENTAL RELEASE OF BELOW-MPC GAS OCCURRED DURING A ROUTINE SAMPLING OF THE PRESSURIZER GAS SPACE WHEN THE RECIRCULATION VENT VALVE TO THE LOW-PRESSURE SURGE TANK WAS LEFT OPEN, ALLOWING BACKFLOW FROM SURGE TANK TO SAMPLE HOOD. 32 MICROCURIES OF BETA-GAMMA AND 60 MILLICURIES OF TRITIUM WERE RELEASED IN A 2-1/2-HOUR PERIOD.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

AIRBORNE RELEASE + *FUEL BURNUP + FAILURE, OPERATOR ERROR + REACTOR, PWR + YANKEE ROWE (PWR) + *COOLANT CHEMISTRY + INCIDENT, HUMAN ERROR + *OFF GAS + CHLORINE + REPORT, OPERATIONS SUMMARY + STEAM GENERATOR + HEAT EXCHANGERS

O16660
T. R. SCHWALM CITED FOR NON-COMPLIANCE
THEODORE R. SCHWALM, INC., LANCASTER, PA.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(29), PAGES 28-29 (JULY 17, 1967)

(MAY 11) A JANUARY 10 INSPECTION RESULTED IN CITATION ON 5 ITEMS OF TRITIUM CONTAMINATION, DISCHARGE, AND SURVEY PRACTICES. RESULTS OF SMEAR SURVEYS ARE NOT AVAILABLE FOR A WEEK AFTER PERFORMED.

*COMPLIANCE + RADIATION SAFETY AND CONTROL

O16661
U.S. RADIUM CORPORATION REPORTS EXCESSIVE STACK DISCHARGE OF TRITIUM
UNITED STATES RADIUM CORPORATION, BLOOMSBURG, PA.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(29), PAGE 29 (JULY 17, 1967)

(MAY 9) ON APRIL 13/14 AND 26TH, SOLUBLE TRITIUM WAS DISCHARGED ABOVE MPC EVEN THOUGH NO OPERATIONS WERE PERFORMED AND VACUUM PUMP IS VENTED THROUGH DRYING COLUMNS. THE PROBLEM WILL BE STUDIED FURTHER.

*AIRBORNE RELEASE + *STACK

O17116
T. R. SCHWALM REPLIES TO COMPLIANCE CITATION OF MAY 11, 1967
THEO. R. SCHWALM, INC., LANCASTER, PA.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(33), PAGE 28 (AUGUST 14, 1967)

(LETTER, JUNE 6) (1) PLANT HAS BEEN DECONTAMINATED, (2) TRITIUM STACK RELEASE FROM NEW FACILITIES IS WELL WITHIN LIMITS, ROOF IS A RESTRICTED AREA, (3,4) MONTHLY SURVEYS ARE TAKEN OF TRITIUM RELEASED TO SEWERS, WATER SAMPLES TAKEN OF WASH LINES, (5) SURGE TESTS OF SCREENS FOR TRITIUM PAINTING SHOW 1000 DPM/100 CC. MOVING TO A SEPARATE BUILDING WILL ELIMINATE MANY PROBLEMS.

*COMPLIANCE + CONTAMINATION + RADIOISOTOPE

O17373
PENNSYLVANIA STATE UNIVERSITY RECEIVES TRITIUM CONTAMINATED PACKAGE
PENNSYLVANIA STATE UNIVERSITY
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(34), PAGE 33, (AUGUST 21, 1967)

(TWX, JULY 11) LOUISIANA STATE UNIVERSITY SHIPPED A PACKAGE CONTAINING 1 CURIE OF TRITIUM AS 1 ML OF WATER. RECEIVED BY PENNSYLVANIA STATE UNIVERSITY ON JULY 10, 1967. THE PACKING MATERIAL WAS GROSSLY CONTAMINATED, AND THE LAST TUBE WITH STOPPER APPEARED TO BE EMPTY. FURTHER INVESTIGATION UNDERWAY.

SHIPPING CONTAINER + *TRANSPORTATION AND HANDLING + INCIDENT + *RADIOISOTOPE

O17511
MIT GRANTED EXEMPTION FROM 10CFR 20 PROVISIONS RELATING TO DISCHARGE OF TRITIUM TO SEWER
AEC, DIVISION OF REACTOR LICENSING
2 PAGES, MARCH 8, 1967, DOCKET NO. 50-20, MIT RESEARCH REACTOR

A LEAKY HEAT EXCHANGER CONTAMINATED THE SECONDARY COOLING SYSTEM WITH ABOUT 12 CURIES OF TRITIUM. PERMISSION WAS GRANTED TO DISCHARGE THIS CONTAMINATED WATER (20,000 GAL) INTO A SANITARY SEWER AT A CONTROLLED FLOW RATE TO ENSURE DILUTION IN THE SEWER BELOW MPC.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

017511 *CONTINUED*
DILUTION + REACTOR, HWR + NPC + REACTOR, RESEARCH + *WASTE DISPOSAL, RIVER + WASTE DISPOSAL, LIQUID + RADIATION SAFETY AND CONTROL

018385
CASE INSTITUTE OF TECHNOLOGY REPORTS REFRIGERATOR EXPLOSION ENDANGERING ISOTOPES
CASE INSTITUTE OF TECHNOLOGY, CLEVELAND, OHIO
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(40), PAGE 28, (OCTOBER 2, 1967)

(LETTER, JULY 31) 9 MICROCURIES OF CARBON-14 AND 2 MICROCURIES OF TRITIUM WERE IN A REFRIGERATOR WHICH EXPLODED JULY 26, RESULTING IN EXTENSIVE DAMAGE TO LAB. THE ISOTOPES WERE IN A BOTTOM DRAWER, WERE DILUTED AND FLUSHED DOWN THE DRAIN.

CARBON + *EXPLOSION + INCIDENT + STORAGE CONTAINER + *RADIOISOTOPE

018386
JOHNS HOPKINS U TRITIUM ACCIDENT
JOHN HOPKINS UNIVERSITY, MCCOLLUM-PRATT INSTITUTE, BALTIMORE, MD.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(40), PAGE 29 AND 30, (OCTOBER 2, 1967)

(LETTER, JUNE 16) AN INDIVIDUAL BROUGHT 5 SAMPLES OF 10 CURIES EACH OF TRITIUM DIRECTLY FROM ARGONNE WITHOUT A LICENSE AND WITHOUT NOTIFYING PHYSICS DEPT. CHAIRMAN OR SAFETY OFFICER. PROCEDURES THAT THE INDIVIDUAL SET UP FOR HANDLING AND IN CASE OF BREAKAGE WERE TOTALLY INADEQUATE. TWO OTHER INDIVIDUALS RECEIVED 0.8 AND 0.2 REM, FOLLOWING A SPILL ON FEBRUARY 20. CENTRAL AIR CONDITIONING SPREAD TRITIATED WATER THROUGH THE BUILDING BEFORE IT WAS TURNED OFF. CORRECTIONS - (A) BLDG. WAS SEARCHED FOR UNLICENSED SOURCES, WHICH WERE DISPOSED OF. (B) STAFF MEMBERS NOTIFIED. (C) UNIVERSITY VP HAS DEMONSTRATED HE WILL TAKE A PERSONAL INTEREST IN PROBLEMS ENCOUNTERED BY RADIATION SAFETY OFFICER, WHOSE STAFF IS EXPANDED.

VENTILATION SYSTEM + *CONTAMINATION + *INCIDENT, HUMAN ERROR + RADIOISOTOPE + *FAILURE, ADMINISTRATIVE CONTROL

020619
KAMAN NUCLEAR DIV. CITED FOR NON-COMPLIANCE FEBRUARY 28, 1967
KAMAN AIRCRAFT CORP., KAMAN NUCLEAR DIV., COLORADO SPRINGS, COLORADO
1 PAGE, FEBRUARY 28, 1967, ATOMIC ENERGY CLEARING HOUSE, 13(16), PAGE 16, (APRIL 17, 1967)

(LETTER FEBRUARY 28) A DECEMBER 1966 CHECK REVEALED 4 ITEMS OF NONCOMPLIANCE SIMILAR TO FEBRUARY 1965 AND FEBRUARY 1966 INSPECTIONS. (1) INADEQUATE TRITIUM RADIATION SURVEYS, (2) BYPASSING HIGH-RADIATION-AREA INTERLOCKS WHEN HIGH RADIATION AREAS EXISTED, (3) USEC ACCELERATOR TUBES HANDLED IN UNRESTRICTED AREAS WITHOUT RADIATION SAFETY OFFICERS KNOWLEDGE, (4) USED TRITIUM TARGETS WERE NOT LABELED. *** COMPLIANCE DIVISION BELIEVES IMPROVEMENTS ARE NEEDED IN MANAGEMENT OF COMPANIES RADIATION SAFETY PROGRAM.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C. 20432

*COMPLIANCE + INSTRUMENT, INTERLOCK + FAILURE, ADMINISTRATIVE CONTROL + SURVEILLANCE PROGRAM

020620
TRACERLAB CITED FOR NON-COMPLIANCE MARCH 7, 1967
LABORATORY FOR ELECTRONICS, TRACERLAB DIV., WALTHAM, MASS.
2 PAGES, MARCH 7, 1967, ATOMIC ENERGY CLEARING HOUSE, 13(16), PAGE 16-17, (APRIL 17, 1967)

A DEC. 1966 INSPECTION AFTER A DEC. 5 TRITIUM RELEASE AND EXPOSURE RESULTED IN 2 ITEMS OF INADEQUATE SURVEYS. (REPLY, MARCH 14) EMPLOYEE MUST REQUEST A SURVEY WHEN BEGINNING WORK, AND START STACK MONITOR. HOOD-VENTILATION SYSTEMS HAVE BEEN REVIEWED. WE NO LONGER STORE WASTE IN HOODS BUT PACK IT IMMEDIATELY IN CLOSED CONTAINERS FOR DISPOSAL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C. 20432

INHALATION + WASTE STORAGE + *COMPLIANCE + SURVEILLANCE PROGRAM

020722
YANKEE STEAM GENERATOR TUBE REPAIRS
YANKEE ATOMIC ELECTRIC COMPANY, BOSTON, MASS.
1 PAGE, YANKEE ATOMIC OPERATIONS REPORT NO. 79 FOR JULY 1967, PAGE 1, AUGUST 21, 1967, DOCKET 50-29

SYSTEM LEAKAGE WAS 300 GAL/DAY WHEN SHUT DOWN FOR TUBE REPAIRS. I-131 TRACER SHOWED SG-1 LEAK 19.6 G/D, WHILE SG-2 WAS 268 G/D FROM ONE TUBE LEAK NEAR THE TUBE SHEET. SAMPLE-CONTAINER BAILS WERE FOUND ON THE PRIMARY SIDES, WHILE 2 STEEL FABRICATION WEDGES WERE FOUND IN THE SECONDARY. ***PC PUMPS 1 AND 3 THERMAL GASKETS WERE REPLACED. SAFETY REVIEW SHOWS NO. 10 CONTROL ROD STICKING AT 10 IN. OUT (NO HAZARD). THE ACCIDENTAL GAS RELEASE ON APRIL 4 WAS 32.2 MILLICURIES OF BETA-GAMMA AND 60.5 MILLICURIES OF GASEOUS TRITIUM. HYDRAZINE LEAKING INTO CHARGING PUMPS INCREASED PH FROM 5 TO 6.42, CAUSING CRUD BURSTS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C. 20432

*AIRBORNE RELEASE + EFFLUENT + *MAINTENANCE AND REPAIR + REPORT, OPERATIONS + REACTOR, PWR + YANKEE ROWE (PWR)

020722 *CONTINUED*
+ CRUD + COOLANT CHEMISTRY + FAILURE, SCRAM MECHANISM + FAILURE, TUBING + *STEAM GENERATOR

021658
US RADIUM CORP REPORTS EXCESSIVE TRITIUM RELEASES SEPT 27/28, 1967
U.S. RADIUM CORP., BLOOMBURG, PA.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(51), PAGE 36 AND 37, (DECEMBER 18, 1967), DOCKET NO. 50-219

(LETTER, OCT. 24, 67) THE TRITIUM GLASS-TUBE-FILL-FACILITY STACK WAS MONITORED FOR 2 CONSECUTIVE 24-HR PERIODS SEPT. 27 AND 28 AND SHOWED H-3(S) DISCHARGE EFFLUENTS EXCEEDED MPC BY A FACTOR OF 54.77 AND 43.48 DURING ROUTINE WORK. R AND D IS PROGRESSING ON MINIMIZING CONCENTRATIONS AT THE SOURCE. H-3(SUB) IS BEING CONVERTED TO H-3(S) WHICH IS SCRUBBED/TRAPPED BY WATER IMPINGEMENT AND DRYING COLUMN.

*AIRBORNE RELEASE + EFFLUENT + SCRUBBER + *STACK

021715
TRITIUM RELEASE FROM MIT REACTOR DUE TO HEAT EXCHANGER LEAK
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(18), PAGES 14-15 (MAY 1, 1967)

(LETTER, MARCH 24) A TUBE LEAK WAS INDICATED FEB. 21 AND PROVED ON FEB. 23. 60 LITERS OF D2O, CONTAINING 67.8 CURIES OF TRITIUM, HAD LEAKED INTO THE 20,000-GAL SECONDARY SYSTEM. URINE SAMPLES FROM THREE REACTOR-OPERATIONS PERSONNEL WHO SHUT DOWN THE COOLING TOWER WERE 0.29 TO 0.91 MICROCURIE/LITER, BELOW MPC. BLOWDOWN TO THE SEWER AND COOLING TOWER EVAPORATION WERE BOTH BELOW MPC.

EFFLUENT + REACTOR, HWR + INHALATION + *FAILURE, TUBING + HEAT EXCHANGERS

021718
BURTSAVAGE EM
U.S. RADIUM CORP. REPORTS 6 EXCESSIVE STACK DISCHARGES
U.S. RADIUM CORP., BLOOMSBURG, PA.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(18), PAGES 21-22 (MAY 1, 1967)

(LETTER, MARCH 22) DISCHARGES DURING THE FIRST QUARTER OF 1967 WERE 18.26, 126.09, 63.94, 201.37, 15.44, AND 61.74 TIMES MPC PRIMARILY INSTANTANEOUS CONVERSION OF TRITIUM GAS IN WATER TO HTO, SO THAT PERMISSIBLE CONCENTRATIONS OF H (SUB) IN A FACILITY WITH NORMAL HUMIDITY WILL PROBABLY RESULT IN CONCENTRATIONS OF H(S) ABOVE MPC.

*AIRBORNE RELEASE + CHEMICAL REACTION + MPC + *STACK + SORPTION

025349
SOERNSON RC
NON COMPLIANCE CITATION OF US RADIUM
US RADIUM CORPORATION, MORRISTOWN, N. J.
3 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(21), PAGE 18-20 (MAY 20, 1968)

(LETTER, APRIL 11) A NOV. 1967 INSPECTION REVEALED NINE SPECIFIC ITEMS INVOLVING INADEQUATE SURVEYS OF AIRBORNE TRITIUM AND 4 OTHER ISOTOPES, PLUS INADEQUATE RECORD KEEPING, INSUFFICIENT DECONTAMINATION AND SAFETY INSTRUCTION, AND FAILURE TO REPORT EXCESSIVE AIRBORNE CONCENTRATION EXPOSURE TO AEC. *** THESE ARE SIMILIAR TO ONES IN OUR JULY 20, 1967, CITATION, WHICH INDICATED INADEQUATE MANAGEMENT CONTROL. STEPS SPECIFIED BY U.S. RADIUM IN AUG. 15 AND OCT. 5 CORRESPONDENCE AND AT SEPT. 27 MEETING ARE DEMONSTRATED INEFFECTIVE OR NOT CARRIED OUT. RADIUM FACILITY REMAINS GROSSLY CONTAMINATED AND POORLY VENTILATED. NEVERTHELESS, OPERATIONS HAVE BEEN RESUMED, AND SOME OF THOSE PEOPLE ALSO WORK WITH BY-PRODUCT MATERIAL.

*AIRBORNE RELEASE + KRYPTON + BYPRODUCT MATERIAL + *COMPLIANCE + NICKEL + RADIUM + RADON + AMERICIUM + RADIOISOTOPE

027525
SELECTED TOPICS OF INTEREST
YANKEE ATOMIC ELECTRIC COMPANY, MASSACHUSETTS
DOCKET 50029-131 +. 9 PAGES, YANKEE OPERATION REPORT NO. 116, AUGUST 1970, DOCKET 50-29, TYPE--BWR, MFG--WEST., AE--STONE + WEBSTER

ONE OF A SERIES OF MONTHLY OPERATING REPORTS. REACTOR WAS SHUT DOWN TO REPAIR LEAKS IN THE NO.1 AND 3 STEAM GENERATORS. PRIMARY-TO-SECONDARY LEAK RATE INCREASED FROM 526 TO 1007 GPD IN 21 DAYS. MAINTENANCE REQUIRED 10 DAYS. TUBES PLUGGED BY USING THE EXPLOSIVE WELDING TECHNIQUE. LIQUID RELEASE CONTAINED .044 MC OF GROSS BETA-GAMMA ACTIVITY AND 90.05 CURIES TRITIUM. GASEOUS RELEASE TOTALLED 1.74 CURIES OF GROSS BETA-GAMMA ACTIVITY AND 5.4 MC OF TRITIUM. SECONDARY PLANT WATER DISCHARGE CONTAINED 4.43 MC OF BETA-GAMMA AND 73.83 CURIES OF TRITIUM. ALSO 3.94 CURIES OF TRITIUM RELEASED AS VAPOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*MAINTENANCE AND REPAIR + *REPORT, OPERATIONS + REACTOR, PWR + WASTE DISPOSAL + YANKEE ROWE (PWR) +

027525 *CONTINUED*
*RADIOACTIVITY RELEASE + MAIN COOLING SYSTEM + FAILURE, TUBING + STEAM GENERATOR + LEAK + OPERATING EXPERIENCE

028573
LOW LO
NONCOMPLIANCE CITATION
U.S. ATOMIC ENERGY COMMISSION
LETTER TO U.S. RADIUM CORPORATION, SEPT. 19, 1968

A JULY 1968 INSPECTION REVEALED THAT (1) AIRBORNE TRITIUM CONCENTRATION SURVEYS WERE NOT MADE, (2) TRITIUM CONTAMINATION EXCEEDED LIMITS, (3) AIRBORNE RADON CONCENTRATION EXCEEDED LIMITS. IN ADDITION, WE NOTE (A) ROOF AND 3 DIRECTIONS ARE UNRESTRICTED AREAS, SO DIFFUSION CALCULATIONS ARE NOT APPROPRIATE. CALCULATIONS WERE NOT SUPPORTED BY METEOROLOGICAL DATA. (B) EACH STACK WAS CONSIDERED INDIVIDUALLY, THOUGH ALL STACKS MAY BE RELEASING AT SAME TIME. (C) TRITIUM IN IMPINGER WATER SAMPLES AND URINE SAMPLES WERE 30% BELOW ACTUAL CONCENTRATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + DIFFUSION + BYPRODUCT MATERIAL + STACK + RADIUM + RADON + CONTAMINATION + CYLINDER GAS

029142
CITATION CORRESPONDENCE
UNITED STATES RADIUM CORPORATION
LETTER TO COMPLIANCE, OCTOBER 8, 1968

REGARDING THE CITATIONS SEPT. 19, WE ARE SURPRISED AT 2 AND 4 (SURFACE CONTAMINATION) AS THESE WERE ISOLATED SPOTS BEING CLEANED UP. (1) - DURING 7 OPERATING CYCLES, OPERATOR WAS EXPOSED ONCE (TO 2X LIMIT FOR 48 MIN). THIS CHECKS WITH URINE SAMPLING. (2,4) - MEN HAVE BEEN ASSIGNED TO REMOVE FIXED RADIUM CONTAMINATION. A NEW CONTROL PROGRAM IS EFFECTIVE. DAILY WIPE SAMPLES AND HP RESPONSIBLE UNTIL CLEANED UP. (3) - THE AREA HAS BEEN OUT OF PRODUCTION SINCE LATE 1966 AND HAS NOW BEEN LOCKED. (A) TRITIUM RELEASE MAXIMUMS IN 1968 HAVE BEEN WITHIN SITE BOUNDARIES, (B) THE STACK SUMMATION METHOD WAS USED TO TREAT THE SEVERAL STACKS AS AN AREA SOURCE, USING LEAST FAVORABLE METEOROLOGY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + *SOURCE, CONTINUOUS + COMPLIANCE + RADIUM + CONTAMINATION + RADIOACTIVITY RELEASE + FAILURE, ADMINISTRATIVE CONTROL + *SOURCE, MULTIPLE

030279
CORRESPONDENCE ON TRITIUM PAINTING
THEODORE R. SCHWALM, INC.
2 PAGES, LETTER TO COMPLIANCE, OCTOBER 3, 1968

IN ANSWER TO CITATION OF SEPT. 24, 1968 - (1) GLOVE-BOX DUCT TO MAIN EXHAUST IS CLOSED, AND CONTINUED AIR SAMPLES SHOW WITHIN LIMITS. (2) THESE TESTS HAVE BEEN PERFORMED FOR YEARS BY THE MATERIAL SUPPLER, SATISFACTORY TO PREVIOUS AEC INSPECTORS. (3) AIR SAMPLES JUNE-AUGUST 68 OF PAINTING ROOM WERE SATISFACTORY. ***(REPLY NOV 12.) (1) YOU SHOULD ENSURE THAT THIS DOES NOT INCREASE AIRBORNE ACTIVITY FROM TRITIUM STORED THERE. (2) CERTIFICATION BY SUPPLIER OF PAINT (VIBRATION AND IMMERSION) REQUIRED. (3) SAMPLES FROM OUTSIDE FACILITY ARE INADEQUATE. STACK DISCHARGES ARE ABOVE MPC, SHOULD CONTINUE TO BE USED WITH DILUTION CALCULATIONS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + DILUTION + GLOVE BOX + BYPRODUCT MATERIAL + VENTILATION SYSTEM + COMPLIANCE + *STACK + SURFACE, PAINTED + *MONITORING PROGRAM, ENVIRONMENTAL

032284
SHIPMENT RADIATION LEVELS 20 R/HR
PITTSBURGH TESTING LABORATORY
1 PAGE, TWX TO AEC-COMPLIANCE, NEW JERSEY, JANUARY 24, 1969

AN IR-192 RADIOGRAPHY SOURCE WAS RECEIVED FROM OUR SALT LAKE CITY OFFICE, INDICATING 20 R/HR ON ONE SIDE OF THE SHIPPING CONTAINER. WE ARE TRACING SHIPMENT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*TRANSPORTATION AND HANDLING + RADIATION SAFETY AND CONTROL + RADIOGRAPHY + SHIELDING + FAILURE, ADMINISTRATIVE CONTROL

036066
NONCOMPLIANCE CITATION FOR UNAUTHORIZED TRANSFER AND POSSESSION OF TRITIUM
U.S. ATOMIC ENERGY COMMISSION

036066 *CONTINUED*
3 PAGES, LETTERS TO ARMY MOBILITY EQUIPMENT COMMAND, MARCH 7, 1969

A NOVEMBER 13, 1968, INVESTIGATION REVEALED LENSATIC COMPASSES CONTAINING TRITIUM WERE TRANSFERRED OCT. 1968 FROM INDIANTOWN GAP MILITARY RES. TO DEFENSE SUPPLY AGENCY, WHICH DID NOT POSSESS A VALID AEC LICENSE TO RECEIVE AND POSSESS TRITIUM. THIS IS CONTRARY TO 10 CFR 30.3 ON UNLICENSED USE OF MATERIAL. *** SOME OF THE LENSATIC COMPASSES WERE EVENTUALLY SOLD TO THE GENERAL PUBLIC.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

LICENSE STATUS + BYPRODUCT MATERIAL + *COMPLIANCE + FAILURE, ADMINISTRATIVE CONTROL + *CONSUMER PRODUCT

037494
T.R. SCHWALM OF LANCASTER, PA. CITED FOR NONCOMPLIANCE WITH LICENSE AND 10CFR20 (TRITIUM)
THEODORE R. SCHWALM, INC., LANCASTER, PA.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 15(33), PAGE 29 (AUGUST 18, 1969)

EXCESSIVE AMOUNT OF RADIOACTIVE MATERIAL (TRITIUM) RELEASED FROM STACK AS INDICATED BY MEASUREMENTS MADE OF MAIN STACK EXHAUST SINCE MARCH 1968. NO RECORDS MAINTAINED OF TESTS CONDUCTED AS REQUIRED BY LICENSE. EXCESSIVE AMOUNT OF REMOVABLE RADIOACTIVE CONTAMINATION ON FLOOR AND OTHER SURFACES IN UNRESTRICTED AREA. *** CONDITIONS MUST BE CORRECTED AND APPROPRIATE RESPONSE MADE.

*SURFACE CONTAMINATION + *WASTE DISPOSAL, ATMOSPHERIC + STACK + ACCIDENT, RADIOISOTOPE + WASTE DISPOSAL, GAS + *INCIDENT, NONREACTOR + RADIOACTIVITY RELEASE + FAILURE, ADMINISTRATIVE CONTROL

038078
U. S. RADIUM CORPORATION EMPLOYEE RECEIVES OVERDOSE OF TRITIUM
U. S. RADIUM CORPORATION
2 PAGES, LETTER TO DIRECTOR, DIVISION OF COMPLIANCE, SEPTEMBER 8, 1969

BECAUSE OF A FAULTY GAS-FILL SYSTEM MANIFOLD AND SEAL AND FAULTY OPERATION OF THE MONITOR SYSTEM AN EMPLOYEE RECEIVED AN OVERDOSE OF AIRBORNE TRITIUM. CALCULATIONS INDICATED PROBABLE EXPOSURE TO CONCENTRATION 15.6 TIMES PERMISSIBLE 40-HR WORK WEEK LIMIT FOR RESTRICTED AREA. ***INVESTIGATIONS REVEAL SHORTCOMINGS OF TRITON MONITORS. ADDITIONAL MONITORING EQUIPMENT WILL BE UTILIZED IN FUTURE AND MORE RIGID CONTROL OF MONITORING BEFORE RE-ENTERING RESTRICTED AREAS.

PUBLIC DOCUMENT ROOM, 1717 H. STREET, WASHINGTON, D. C. 50545

*AIRBORNE RELEASE + *VENTILATION SYSTEM + *FAILURE, INSTRUMENT + PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR + FAILURE, ADMINISTRATIVE CONTROL

038079
EMPLOYEES INHALE AIRBORNE RADIOACTIVE MATERIAL (TRITIUM)
UNITED STATES RADIUM CORPORATION
5 PAGES, LETTER TO DIRECTOR, DIVISION OF COMPLIANCE, SEPTEMBER 18, 1969

THREE EMPLOYEES BREATHED AIRBORNE RADIOACTIVE MATERIALS IN A RESTRICTED AREA IN EXCESS OF 10CFR20. DAILY URINE SAMPLES INDICATED AN INCREASE VARYING FROM 3-11 MICROCURIES/LITER. ***THE OVEREXPOSURE WAS CAUSED BY IMPROPER VENTILATION OF AN OPERATION NOT PREVIOUSLY PERFORMED IN THE BUILDING, INVOLVING 15-20 TIMES AMOUNT OF TRITIUM NORMALLY WORKED WITH. PROGRAM TRANSFERRED TO GLOVE BOX WITH HIGH VENTILATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

INCIDENT, EXPOSURE + *AIRBORNE RELEASE + *VENTILATION SYSTEM + ANALYTICAL TECHNIQUE + PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR + EXCRETION, URINE

038745
REPORTED LOSS AND SUBSEQUENT RECOVERY OF 2 TRITIUM SOURCES
U.S. ATOMIC ENERGY COMMISSION + BARBER-COLMAN COMPANY
3 PAGES, LETTERS BETWEEN BARBER-COLMAN CO. AND L.D. LOW, DIVISION OF COMPLIANCE, SEPTEMBER 6, 1969

ON JUNE 27, 1969, BARBER-COLMAN CO. REPORTED TO THE DIV. OF MATERIALS LICENSING THE LOSS OF TWO DETECTORS CONTAINING TRITIUM SOURCES (SHIPMENT TO A CUSTOMER). AUG. 27, 1969, BARBER-COLMAN CO. REPORTED THE SOURCES FOUND AND DELIVERED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

COMPLIANCE + SOURCE, RADIATION, LOST

039429
NONCOMPLIANCE OF LICENSE BY NON-CERTIFICATION OF SPECIFICATIONS DESCRIBED IN LICENSE
U.S. ATOMIC ENERGY COMMISSION

039429 *CONTINUED*
2 PAGES, LETTER TO TOSHIBA AMERICA, INC. FROM L. D. LOW, DIVISION OF COMPLIANCE, OCTOBER 7, 1969

COMPANY IMPORTS TIMEPIECES WITH HANDS AND DIALS CONTAINING PROMETHIUM-147 OR TRITIUM WITHOUT SPECIFICATIONS. THE ORIGINAL LETTER OF CITATION WAS SENT ON JULY 28, 1969. SUBSEQUENT LETTERS WERE SENT ON SEPT. 9 AND OCT. 7, 1969.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

COMPLIANCE + PROMETHIUM

039821
TRITIUM IMPORTED INTO UNITED STATES FOR USE IN TIMEPIECES
BULOVA WATCH COMPANY, INC.
1 PAGE, LETTER - BULOVA WATCH COMPANY TO DIVISION OF MATERIALS LICENSING - DECEMBER 31, 1969

STATES THAT DURING 1-YEAR PERIOD ENDING JUNE 30, 1969, THE COMPANY IMPORTED 904,990 CURIES OF HYDROGEN-3 (TRITIUM) AS APPLIED TO TIMEPIECE DIALS AND HANDS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*BYPRODUCT MATERIAL + *REGULATION, AEC + RADIOISOTOPE + SPECIAL NUCLEAR MATERIAL + *INDUSTRIAL SAFETY

040450
QUANTITY OF TRITIUM IMPORTED FOR FISCAL YEAR 1968
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
1 PAGE, LETTER - AEC DIVISION OF COMPLIANCE TO HOLZER WATCH COMPANY - AUGUST 19, 1969

STATES THAT ANNUAL REPORTS SHOULD REFLECT ACTUAL QUANTITY OF TRITIUM IMPORTED. LETTER OF AUG. 5 TO AEC INDICATED THAT 2150 WATCHES HAD BEEN IMPORTED, WITH AMOUNT OF TRITIUM NO GREATER THAN 2745 MILLICURIES. A SIMILAR ITEM OF NONCOMPLIANCE WAS NOTED FOR FISCAL YEAR 1967.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*COMPLIANCE + FAILURE, ADMINISTRATIVE CONTROL + INDUSTRIAL SAFETY

041148
NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
AEC, DIVISION OF COMPLIANCE
2 PAGES, LETTER - AEC DIVISION OF COMPLIANCE TO T. R. SCHWALM, INC. - JUNE 19, 1969

NONCOMPLIANCE ITEMS INCLUDE (1) CONCENTRATION OF EFFLUENTS TO UNRESTRICTED AREAS EXCEEDS LIMITS, (2) NO RECORDS MAINTAINED OF REQUIRED TESTS, (3) FLOORS IN UNRESTRICTED AREAS CONTAMINATED WITH TRITIUM UP TO 25,000 DPM/100 CM2, (4) NO EVALUATIONS WERE MADE OF AIRBORNE CONCENTRATIONS OF TRITIUM AT UNVENTILATED GLOVE BOX.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

GLOVE BOX + BYPRODUCT MATERIAL + *COMPLIANCE + *CONTAMINATION + RADIOACTIVITY RELEASE + RADIOCHEMICAL PLANT SAFETY + RADIOCHEMICAL PROCESSING + *FAILURE, ADMINISTRATIVE CONTROL + MONITORING SYSTEM, RADIATION + HOT LABORATORY

041159
UNAUTHORIZED POSSESSION OF TRITIUM TARGET
AEC, DIVISION OF COMPLIANCE
1 PAGE, LETTER - AEC DIVISION OF COMPLIANCE TO UPSALA COLLEGE - DECEMBER 16, 1969

STATES THAT THE COLLEGE POSSESSES A 9.5-CURIE TRITIUM TARGET WITHOUT A VALID LICENSE AND THAT APPLICATION SHOULD BE SUBMITTED

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + COMPLIANCE + REGULATION, AEC + FAILURE, ADMINISTRATIVE CONTROL + COLLEGES AND UNIVERSITIES

041359
NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
AEC, DIVISION OF COMPLIANCE
2 PAGES, LETTER - AEC DIVISION OF COMPLIANCE TO LUMINOUS PROCESSES, INC. - DECEMBER 12, 1969

INSPECTION IN NOVEMBER REVEALED A VIOLATION WHICH CONSISTEND OF INADEQUATE EVALUATIONS OF AIRBORNE TRITIUM CONCENTRATIONS IN RESTRICTED AREAS, AND EFFLUENT TO UNRESTRICTED AREAS.

041359 *CONTINUED*
EFFLUENT + *FAILURE + BYPRODUCT MATERIAL + *COMPLIANCE + *MONITOR, AIR + RADIOACTIVITY RELEASE + *SURVEY + HOT LABORATORY

041365
POSSESSION OF SOURCE WITHOUT A LICENSE
AEC, DIVISION OF COMPLIANCE
2 PAGES, LETTER - AEC DIVISION OF COMPLIANCE TO TENNECO CHEMICALS, INC. - JULY 22, 1969

STATES THAT COMPANY POSSESSES A 250-MILLICURIE TRITIUM SOURCE IN A CHROMATOGRAPHY DETECTOR CELL AND THAT A LICENSE IS REQUIRED FOR POSSESSION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + SOURCE, RADIATION + COMPLIANCE + *FAILURE, ADMINISTRATIVE CONTROL

041560
NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
AEC, DIVISION OF COMPLIANCE
2 PAGES, LETTER - AEC DIVISION OF COMPLIANCE TO LUMINOUS PROCESSES, INC. - AUGUST 5, 1969

INSPECTION IN APRIL, JUNE, AND JULY REVEALED THAT EVALUATIONS OF AIRBORNE TRITIUM CONCENTRATIONS IN RESTRICTED AREA AND OF EFFLUENT TO UNRESTRICTED AREA WERE NOT ADEQUATE. CONCENTRATIONS OF 15.9 MICRO-MICRO-CURIES WERE OBSERVED IN EMPLOYEE BREATHING ZONES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + *COMPLIANCE + MONITOR, GAS + FAILURE, ADMINISTRATIVE CONTROL + MONITORING SYSTEM, RADIATION + HOT LABORATORY + INDUSTRIAL SAFETY

041562
CONTROL OF RADIATION SAFETY
AEC, DIVISION OF COMPLIANCE
3 PAGES, LETTER - AEC DIVISION OF COMPLIANCE TO LUMINOUS PROCESSES, INC. - JUNE 6, 1969

STATES THAT RESPONSE TO PREVIOUS NONCOMPLIANCE LETTER IS NOT SUFFICIENT AND REQUESTS ADDITIONAL INFORMATION CONCERNING STEPS TAKEN TO STRENGTHEN MANAGERIAL CONTROL OF RADIATION SAFETY ASPECTS OF TRITIUM PROGRAM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + COMPLIANCE + MONITOR, GAS + *RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL + INDUSTRIAL SAFETY

041563
NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
AEC, DIVISION OF COMPLIANCE
4 PAGES, LETTER - AEC DIVISION OF COMPLIANCE TO LUMINOUS PROCESSES, INC. - APRIL 16, 1969

INSPECTION IN JAN. AND FEB. 1969 REVEALED THAT NONCOMPLIANCE ITEMS - (1) INADEUQATE EVALUATIONS OF RADIATION HAZARDS INCIDENT TO USE OF TRITIATED PAINT - 5 EMPLOYEES EXHIBITED QUARTERLY AVERAGE TRITIUM EXCRETION DATA IN EXCESS OF 28 MICROCURIES/LITER OF URINE ON 9 OCCASIONS IN 1968. (2) BIOASSAYS FOR TRITIUM NOT PERFORMED MONTHLY. (3) TEN DRUMS OF WASTE NOT LABELED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + *COMPLIANCE + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL + HOT LABORATORY

041645
CASTO WR
CONTAMINATION AT TRITIUM PAINTING ESTABLISHMENT
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
1 PAGE, NUCLEAR SAFETY, 11(1), PAGE 64 (JANUARY-FEBRUARY 1970)

AN UNRESTRICTED AREA AT T.R. SCHWALIN, INC., LANCASTER, PA. PLANT WAS CONTAMINATED WITH TRITIUM IN JUNE AND OCTOBER 1968. IN MARCH 1969 THE ACTIVITY WAS 18,000 TO 25,000 DPM/100 SQ CM. LIMIT FOR TRANSFERRABLE TRITIUM CONTAMINATION IS 2000 DPM/SQ CM. CONTAMINATION ON THE PASS BOX SHELF (UNRESTRICTED AREA) WAS 43,000 DPM/SQ CM. CONTAMINATION IN VARIOUS RESTRICTED AREA WAS GREATER THAN 50,000 DPM/SQ CM.

*CONTAMINATION

043005
MAN AT U.S. RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT WHILE REPAIRING EQUIPMENT
U.S. RADIUM CORPORATION
2 PAGES, LETTER TO DIVISION OF COMPLIANCE FROM U.S. RADIUM CORPORATION, JANUARY 7, 1970

THE DAILY URINE SAMPLE SHOWED THAT AN EMPLOYEE RECEIVED 1.6 TIMES WEEKLY DOSE OF TRITIUM WHILE REPAIRING A DEFECTIVE MANOMETER GAUGE. INDIVIDUAL CONSIDERED IT HIS PREROGATIVE AS A MEMBER OF MANAGEMENT TO DECIDE WHETHER OR NOT TO RISK LOW-LEVEL EXPOSURES. HE WAS INFORMED THAT THE RADIATION PROTECTION OFFICER IS TO BE NOTIFIED OF ALL NONROUTINE RADIOACTIVE OPERATIONS AND THAT THE RPO IS TO DECIDE UPON THE MONITORING AND PROCEDURES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FAILURE, OPERATOR ERROR + *INHALATION + *PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

044641
EXPOSURE OF AN EMPLOYEE TO TRITIUM
TRACERLAB, WALTHAM, MASSACHUSETTS
4 PAGES, LETTER - TRACERLAB TO DIVISION OF COMPLIANCE (AEC) - MARCH 30, 1970

WHILE TRANSFERRING A SOLID PRODUCT FROM A FLASK TO A VIAL (USING A SPATULA), WORKER RAISED HOOD WINDOW FOR BETTER VIEW. SHE WAS IN LAB FOR 2.35 HR. TRITIUM URINALYSES INDICATED A TOTAL INTERNAL DOSE OF 153 MREM FOR THE PERIOD OF MARCH 3 THROUGH MARCH 16, 1970. EMPLOYEE WILL RECEIVE ADDITIONAL TRAINING. CLOSER SUPERVISION WILL BE PROVIDED. FOR TRANSFERS OF MATERIAL WINDOWS WILL BE CLOSED AS FAR AS POSSIBLE OR WORK WILL BE DONE IN A DRY BOX.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*INCIDENT, EXPOSURE + FAILURE, OPERATOR ERROR + INHALATION + BYPRODUCT MATERIAL + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + RADIOCHEMICAL PROCESSING + SOLID + HOT LABORATORY

044648
CONTAMINATION OF TWO PERSONS WITH TRITIUM
UNIVERSITY OF IOWA, IOWA CITY
24 PAGES, LETTER - UNIVERSITY OF IOWA TO DIVISION OF COMPLIANCE (AEC) - MARCH 9, 1970

TWO STAFF MEMBERS OF RADIATION RESEARCH LABORATORY WERE EXPOSED TO 35 MICROCURIES OF TRITIUM IN THE FORM OF THYMIDINE. APPLICATION OF EXCESSIVE PRESSURE TO A SYRINGE CAUSED THE NEEDLE TO POP OFF. SOLUTION SPRAYED ON THE TWO PERSONS. BLOOD AND URINE SAMPLE COUNTS WERE ONLY SLIGHTLY HIGHER THAN BACKGROUND. MAXIMUM SKIN CONTAMINATION WAS 421 DPM AT ONE LOCATION. ACCIDENT WAS AN OPERATIONAL ERROR SINCE THE TECHNIQUE BEING USED HAD BEEN DONE SUCCESSFULLY IN THE PAST.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*INCIDENT, EXPOSURE + FAILURE, OPERATOR ERROR + BYPRODUCT MATERIAL + *CONTAMINATION + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + *RADIOLOGY + *EXPOSURE, SKIN + *RADIOPHARMACEUTICAL

047157
TWO OVEREXPOSURES REPORTED (AIRBORNE EFFLUENT, TRITIUM)
U.S. RADIUM CORPORATION
2 PAGES, LETTER - U.S. RADIUM CORPORATION TO DIVISION OF COMPLIANCE (AEC) - OCTOBER 17, 1969

DAILY BREATHING-ZONE SAMPLES FOR TWO EMPLOYEES SHOWED EXPOSURES OF 1.03 AND 1.16 TIMES THE 40-HOUR WORK WEEK LIMIT RESPECTIVELY, FOR THE WEEK OF SEPTEMBER 15 THROUGH SEPTEMBER 21, 1969. THE EMPLOYEES INVOLVED WERE IMMEDIATELY RESTRICTED FROM ALL WORK WITH RADIOACTIVE MATERIALS. THE CAUSE OF THE EXPOSURE WAS A LACK OF ADEQUATE WRITTEN PROCEDURES FOR THE LEVEL VIAL OPERATION AND POOR COMMUNICATION BETWEEN PRODUCTION AND HEALTH PHYSICS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*AIRBORNE RELEASE + BYPRODUCT MATERIAL + *COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION + *RADIOCHEMICAL PLANT SAFETY

047229
LAMBERT BE + SHARP BA + DAWSON KB
AN ACCIDENTAL INTAKE OF TRITIATED WATER
RADIOLOGICAL PROTECTION SERVICE + SOCIAL SECURITY AND MEDICAL RESEARCH COUNCIL, ENGLAND
5 PAGES, 1 FIGURE, 1 TABLE, 19 REFERENCES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 32(10), PP. 682-686 (OCTOBER 1971)

PRESENTS DATA ON AN ACCIDENTAL INTAKE OF TRITIUM WHICH RESULTED IN ABOUT 400 MCI OF TRITIUM DISTRIBUTED THROUGHOUT THE BODY WATER OF ONE MAN. THE URINARY EXCRETION AND LOSS OF TRITIUM FROM BLOOD WERE FOLLOWED FOR A PERIOD OF TIME WHICH ALLOWED A PRECISE ESTIMATE OF DOSE TO BLOOD AND

047229 *CONTINUED*
BODY TISSUES TO BE CALCULATED. IN ADDITION, LYMPHOCYTE CHROMOSOME ABERRATIONS WERE SCORED IN BLOOD SAMPLES AND ATTEMPTS WERE MADE TO CORRELATE DOSE AND ABERRATION YIELD. THE REASONS FOR THE DIFFICULTIES INVOLVED IN DOSE-EFFECT CORRELATIONS IN SUCH CASES ARE DISCUSSED.

ACCIDENT + *INCIDENT, EXPOSURE + DOSE + *PERSONNEL EXPOSURE, RADIATION + GAS + *ABSORPTION + *CHROMOSOMAL EFFECT + *CONCENTRATION + *BLOOD + RADIATION EFFECT + EXPOSURE, ACUTE + EXPOSURE, SKIN + WHOLE BODY + BODY FLUID

048187
AEC INSPECTION CALLS FOR RE-EVALUATION OF COMPANY RADIATION SAFETY PROGRAM
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
4 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO NEW ENGLAND NUCLEAR CORPORATION - MAY 15, 1970

DIV. OF COMPLIANCE NOTES NUMEROUS DEVIATIONS FROM SAFETY RULES SET FORTH IN 10 CFR 20 AND 30. CITATIONS DEAL MOSTLY WITH AIRBORNE CONCENTRATIONS. NOTHING SERIOUS, BUT NONCOMPLIANCE NEVERTHELESS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*AIRBORNE RELEASE + INHALATION + MPC + BYPRODUCT MATERIAL + *COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION + FAILURE, ADMINISTRATIVE CONTROL + *RADIOLOGY + RADIATION EXPOSURE, RECORD KEEPING

048251
LEAKY VIAL OF TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF WORKERS AND WORK AREA
TEMPLE UNIVERSITY, PENNSYLVANIA
3 PAGES, LETTER - TEMPLE UNIVERSITY TO DIVISION OF COMPLIANCE (AEC) - JANUARY 21, 1970

THE LEAK WAS VERY SMALL. THERE WAS NO VISIBLE EVIDENCE OF BREAKAGE ON THE VIAL. EITHER THE VIAL WAS NOT SEALED PROPERLY DURING THE MANUFACTURE OF THE VIAL, OR THE BREAK-SEAL HAD BEEN BROKEN IN PACKAGING, SHIPING, OR UNPACKAGING OF THE TRITIATED GAS. CORRECTIVE ACTION - A WINDOWLESS PROPORTIONAL COUNTER HAS BEEN ESTABLISHED IN THE ROOM SO THAT ALL INCOMING PACKAGES WILL BE SMEARED AND COUNTED THERE. THE PACKAGES WILL BE SMEARED FIRST ON THE OUTSIDE SURFACES AS WELL AS THE SOURCE CONTAINER ITSELF TO INDICATE WHETHER THE RADIOACTIVE MATERIAL MAY HAVE BEEN LEAKING PRIOR TO ITS ENTRANCE INTO THE UNIVERSITY AND WHETHER ANY COULD HAVE ESCAPED AND BE DEPOSITED WITH THE CARRIER.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + *SOURCE, RADIATION + *COMPLIANCE + *CONTAMINATION + *PERSONNEL EXPOSURE, RADIATION + *LEAK

048261
EXPOSURE OF TWO TECHNICIANS TO TRITIUM
UNIVERSITY OF MARYLAND
14 PAGES, LETTER - UNIVERSITY OF MARYLAND TO DIVISION OF COMPLIANCE (AEC) - APRIL 23, 1970

BIOASSAY INDICATED A CALCULATED CONCENTRATION OF ABOUT 41 AND 2 MICROCURIES/LITER FOR TWO WORKERS AT THE UNIVERSITY OF MARYLAND FOLLOWING A ROUTINE TAGGING OF BLOOD PLASMA STEROIDS. SINCE BOTH WERE CONTINUALLY INVOLVED, EACH WOULD BE EXPOSED TO THE SAME AIRBORNE CONCENTRATION OF TRITIUM. EXPOSURE MUST HAVE BEEN FROM DIRECT CONTACT OR INGESTION. THOUGHT TO BE AN ISOLATED INCIDENT. PROCEDURES WERE REVIEWED AND WORKERS WERE RE-INSTRUCTED IN PROPER ISOTOPE HANDLING TECHNIQUES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

INCIDENT, EXPOSURE + *FAILURE, OPERATOR ERROR + INGESTION + BYPRODUCT MATERIAL + SOURCE, RADIATION + PERSONNEL EXPOSURE, RADIATION + RADIOLOGY + COLLEGES AND UNIVERSITIES

048268
FLASK CONTAINING 2.25 CURIES OF TRITIUM IMPLODES AT RADIOPHARMACEUTICAL LAB.
MCNEIL LABORATORIES, INC., PA.
4 PAGES, LETER - MCNEIL LABORATORIES, INC. TO DIVISION OF COMPLIANCE (AEC) - MAY 8, 1968

A FLASK CONTINAING 2.25 CURIES OF TRITIUM IN THE FORM OF ORGANIC MATERIALS IN METHANOL SOLUTION AT LIQUID-NITROGEN TEMPERATURE UNDER VACUUM IMPLODED. THE CONTENTS OF THE FLASK WERE SPATTERED INSIDE A STAINLESS-STEEL HOOD. SOME OF THE LABELED MATERIAL WAS THROWN OUT OF THE HOOD AND WAS DEPOSITED OVER THE SURROUNDING AREA. THE LABORATORY WAS SEALED OFF IMMEDIATELY. AN OPERATOR STANDING NEAR THE IMPLODING FLASK, ALTHOUGH NOT DIRECTLY IN THE PATH OF THE FLYING MATERIAL, IMMEDIATELY DISCARDED THE LABORATORY COAT HE WAS WEARING AND SHOWERED HIMSELF THOROUGHLY. URINE LEVELS OF TRITIUM WERE FOLLOWED FOR THREE DAYS, SHOWING ALMOST NO CONTAMINATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FAILURE, EQUIPMENT + EXPLOSION + BYPRODUCT MATERIAL + *COMPLIANCE + *CONTAMINATION + *PERSONNEL EXPOSURE, RADIATION + RADIOCHEMICAL PROCESSING + RADIOLOGY + PRESSURE, SUBATMOSPHERIC

049549
MINDER W
INTERNE KONTAMINATION MIT TRITIUM
AUS DER SEKTION FUR STRAHLENSCHUTZ DES EIDG. GESUNDHEITSAMTES, BERN
5 PAGES, 2 FIGURES, 1 TABLE, 7 REFERENCES, STRAHLENTHERAPIE, VOL. 137, PG. 700-704 (1969)(IN GERMAN)

SERIOUS CHRONIC INTAKE OF TRITIUM GAS BY SEVERAL LUMINOUS PAINT WORKERS LED TO DEATH IN ONE CASE. THE EXPONENTIAL 24.9 EXP (-0.068T) PLUS 11.9 EXP (-0.005T) WAS FITTED TO ONE URINARY SET OF DATA OVER 340 DAYS, IN MICROCURIES PER LITER, THE LONGEST BIOLOGICAL HALF-LIFE CALCULATED TO BE 139 DAYS, DATA FROM J GOTTSCHEWSKY BY PERSONAL COMMUNICATION. THE LONGEST BIOL. HALF-LIFE FOUND WAS 230 DAYS (5%), 90% OF THE TRITIUM HAVING COME OUT WITH A 30 DAY HALF LIFE, FOR ONE WORKER. A 26 OCTOBER 1965 AUTOPSY GAVE TRITIUM IN MICROCURIES PER KILOGRAM AS FOLLOWS - LUNG 15, LIVER 24, KIDNEY 28, MUSCLE 29, SPLEEN 18. WATER AND FAT CONTENTS ARE GIVEN FOR THE SAME ORGANS.

INHALATION + WATER + *PERSONNEL EXPOSURE, RADIATION + GAS + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + BIOLOGICAL HALF-LIFE + PHYSIOLOGY/METABOLISM + *TOXICITY + *DISTRIBUTION + EXCRETION, URINE + *EXPONENTIAL FUNCTION + *EXPOSURE, CHRONIC + FAT + KIDNEY + LIVER + LUNG + MAN + MUSCLE + SPLEEN + YEAR

049659
SEDLET J + ROBINSON J + FAIRMAN W
A COBALT AND A TRITIUM INCIDENT AT ARGONNE NATIONAL LABORATORY
ARGONNE NATIONAL LABORATORY, ILLINOIS
WASH-1023 +. 6 PAGES, 2 TABLES, PG. 101-106, 1958

TWO MEN DECONTAMINATING HOOD DUCTWORK WHERE NEUTRON-IRRADIATED COBALT METAL HAD BEEN CLEANED WITH A WIRE BRUSH NOTED THAT THEY HAD INHALED SOME DUST AND WERE WHOLE-BODY COUNTED. BIOLOGICAL HALF-LIFE WAS 1.6 DAYS BETWEEN 2ND AND 7TH DAY POSTEXPOSURE, WITH A 42 DAY HALF-LIFE BETWEEN 17TH AND 50TH DAY, AND AFTER 90 DAYS THE HALF-LIFE HAD INCREASED TO 110 DAYS, AT WHICH TIME BODY BURDEN WAS ABOUT 0.05 MICROCURIE, WITH MOST OF THE COBALT PROBABLY IN THE LIVER. 80-90 PERCENT APPEARED IN FECES IN 1ST WEEK. FECAL/URINE RATIO OF CO INCREASED TO 150 IN 2 TO 5 DAYS, BEING 2.5 ON 29TH DAY WITH TOTAL EXCRETION AMOUNTING TO 1.7 OF BODY BURDEN, CORRESPONDING TO A HALF LIFE OF 42 DAYS. (CF R D JORDAN ET AL., RADIOACTIVITY IN MAN, CC THOMAS PUB (1965) PG 281-9). GASKET LEAK OF HEAVY WATER CONTAINING 700 MICROCURIES TRITIUM/ML FROM THE CP-5 REACTOR CONTAMINATED 4 CLEANUP MEN, WHOSE URINARY TRITIUM SHOWED HALF LIVES RANGING FROM 7.5 TO 9.0 DAYS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

COBALT + INHALATION + REACTOR SAFETY SYSTEM + PERSONNEL EXPOSURE, RADIATION + RADIONUCLIDE UPTAKE + ANIMAL, VERTEBRATE + PHYSIOLOGY/METABOLISM + MAN + *RETENTION + *WHOLE BODY + *RETENTION FUNCTION + MONTH

049915
PERSONNEL EXPOSURE TO TRITIUM
THEODORE R. SCHWALM INC.
1 PAGE, LETTER - THEODORE R. SCHWALM, INC. TO DIVISION OF COMPLIANCE (AEC) - MARCH 3, 1970

URINE COUNT REACHED A MAXIMUM OF 31.1 MICROCURIES/LITER. GIRL OPENS SHIPMENTS AND STORES THEM. HAD RECEIVED TRITIUM SHIPMENT FROM SWITZERLAND. WILL MOVE OPERATION NEAR AN EXHAUST HOOD.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*INCIDENT, EXPOSURE + INHALATION + BYPRODUCT MATERIAL + *VENTILATION SYSTEM + COMPLIANCE + PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR + FAILURE, ADMINISTRATIVE CONTROL + RADIOLOGY

055009
RESPONSE TO AEC NONCOMPLIANCE CITATION
THEODORE R. SCHWALM, INC., LANCASTER, PENNSYLVANIA
5 PAGES, LETTER - THEODORE R. SCHWALM, INC. TO DIVISION OF COMPLIANCE, REGION I (AEC) - JANUARY 13, 1972

CITATION CONCERNED THE FAILURE TO PROPERLY MONITOR THE CONCENTRATION OF TRITIUM RELEASED TO ATMOSPHERE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + FISSION PRODUCT RELEASE + *MONITOR, STACK + COMPLIANCE + SURVEY, RADIATION + *RADIOCHEMICAL PROCESSING + *FAILURE, ADMINISTRATIVE CONTROL

057036
MATTHEY BISHOP POSSESSED TRITIUM WITHOUT LICENSE
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
1 PAGE, LETTER - DIVISION OF COMPLIANCE (AEC) TO MATTHEY BISHOP, INC. - AUGUST 17, 1970

MATTHEY BISHOP OBTAINED 2.5-CURIE TRITIUM FROM J. BISHOP AND CO. WITHOUT A VALID AEC LICENSE. COMPANY IS REQUESTED TO APPLY FOR LICENSE OR DESCRIBE THE DISPOSITION OF THE MATERIAL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM

057036 *CONTINUED*
CHARGE $2.00)

*LICENSE STATUS + BYPRODUCT MATERIAL + *COMPLIANCE + FAILURE, ADMINISTRATIVE CONTROL

059951
NEW ENGLAND NUCLEAR REPORTS THREE INCIDENTS IN WHICH WORKERS WERE OVEREXPOSED
NEW ENGLAND NUCLEAR CORPORATION
2 PAGES, LETTER - NEW ENGLAND NUCLEAR CORPORATION TO DIVISION OF COMPLIANCE (AEC) - SEPTEMBER 23, 1970

MAN RECEIVED AN INTERNAL EXPOSURE OF .84 TO 1.61 MILLICURIES OF CR-50 WHEN HE STRUCK HIS HEAD IN A HOOD DURING A CLEANING OPERATION.***A FLASK CONTAINING 12 CURIES OF H-3 IN ETHER LEAKED THROUGH A SEAL, EXPOSING 20 PEOPLE. CALCULATED INTERNAL EXPOSURES RANGED UP TO 135 MREM. FLASK WAS RESEALED.***THE EXHAUST TUBE FROM A PUMP BROKE RELEASING H-3 TO LAB. ATMOSPHERE. CHEMIST RECEIVED AN INTERNAL EXPOSURE OF 27 MREM. PROCEDURES CHANGED TO CORRECT THIS SITUATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FAILURE + *FAILURE, OPERATOR ERROR + INGESTION + INHALATION + BYPRODUCT MATERIAL + *SHIPPING CONTAINER + CHROMIUM + COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION + RADIOCHEMICAL PROCESSING + *FAILURE, TUBING + *LEAK

060110
BRANDT FC + FLURY H + FRICK U + SUTER F
DEFECTIVE FUEL ELEMENTS AND DECONTAMINATION OF THE REACTOR DIORIT (PART I(
EIDGENOESSISCHES INSTITUT FUER REAKTORFORSCHUNG, WUERENLINGEN (SWITZERLAND)
EIR-150(PT.1) +. 71 PAGES, SEPTEMBER 1969 (IN GERMAN)

ON OCTOBER 11, 1967, ONE FUEL ELEMENT OF THE REACTOR DIORIT SUFFERED SEVERE DAMAGE THAT PRODUCED EXTENSIVE CONTAMINATION OF THE REACTOR TANK AND THE PRIMARY COOLING CIRCUIT WITH FISSION PRODUCTS AND URANIUM. AFTER ONE YEAR, THE REACTOR WAS PLACED INTO OPERATION AGAIN. REASONS FOR THE FUEL ELEMENT DEFECT, A RUPTURE OF THE 2 S ALUMINUM CLADDING, WERE STUDIED. EXTENSIVE DECONTAMINATION PROCEDURES WERE PERFORMED. PROTECTIVE MEASURES FOR PERSONNEL PARTICIPATING IN THE DECONTAMINATION WERE DEVELOPED FOR VARIOUS PHASES OF THE PROCEDURE. DURING THE ENTIRE RESTORATION PERIOD, NINE PERSONS RECEIVED EXTERNAL DOSES FROM 3.5 TO 3.8 REM. A FEW INDIVIDUALS SHOWED TRITIUM INCORPORATION THAT WAS BELOW 1/5 OF THE PERMISSIBLE BODY BURDEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ALUMINUM + *DECONTAMINATION + *CLADDING + *FISSION PRODUCT RELEASE + *FAILURE, FUEL ELEMENT + *REACTOR, RESEARCH + RADIATION PROTECTION, ORGANIZATION + *CONTAMINATION + *PERSONNEL EXPOSURE, RADIATION + SWITZERLAND + *FAILURE, CLADDING + STRESS RUPTURE + MAIN COOLING SYSTEM + FUEL ELEMENTS

061448
UNMONITORED LIQUID WASTE RELEASE
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50261-51 +. 1 PAGE, LETTER - CAROLINA POWER AND LIGHT COMPANY TO DIVISION OF REACTOR LICENSING (AEC) - FEBRUARY 9, 1971, DOCKET 50-261, TYPE--PWR, MFG--WEST., AE--EBASCO

ABOUT 300 GAL OF LIQUID WASTE WAS RELEASED WITHOUT MONITORING WHEN AN OPERATOR REMOVED THE MONITOR FROM SERVICE TO CLEAN THE VOLUME CHAMBER. ANALYSIS BEFORE THE RELEASE WAS 3.93 MICROCURIES BETA-GAMMA AND .011 CURIE TRITIUM PER CC, AND AFTER THE RELEASE WAS 4.24 MICROCURIES B-G AND .011 CURIE TRITIUM PER CC. *** ALL OPERATORS WERE RETOLD THE IMPORTANCE OF PROCEDURES AND COORDINATION WITH SENIOR OPERATOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FAILURE, OPERATOR ERROR + MONITOR, LIQUID + REACTOR, PWR + *WASTE DISPOSAL, LIQUID + ROBINSON 2 (PWR) + OPERATING EXPERIENCE

063198
CONTAMINATION IN UNRESTRICTED AREA AND TRITIUM ACTIVITY
U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
10 PAGES, LETTER TO T. R. SCHWALM, INC., NOVEMBER 18, 1970

DURING AN INSPECTION NOV. 18-20, 1970, SMEAR SAMPLES IN AN UNRESTRICTED AREA ADJACENT TO A PAINTING FACILITY WERE FROM 7400 TO 2,600,00 DPM PER 100 SQUARE CENTIMETERS. AEC REQUESTS THE COMPANY TO REEVALUATE AND IMPROVE CONTAMINATION CONTROL. ALSO TRITIUM RELEASES FROM STACK CONTINUE TO EXCEED PERMISSIBLE LIMITS. THE COMPANY REQUESTED THAT A DILUTION FACTOR OF 20 BE APPLIED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + COMPLIANCE + *CONTAMINATION + RADIATION SAFETY AND CONTROL + *RADIOACTIVITY RELEASE + FAILURE, ADMINISTRATIVE CONTROL

063637
CHEMIST HAS UPTAKE OF 767 MICROCURIES OF TRITIUM OVER A 49-HR PERIOD
NEW ENGLAND NUCLEAR CORPORATION
2 PAGES, LETTER TO DIVISION OF COMPLIANCE FROM NEW ENGLAND NUCLEAR CORP., 575 ALBANY ST., BOSTON, MASS. 02118, (APRIL 13, 1971)

THIS PERSON PREPARED TRITIATED CYCLIC ACID. THE OPERATIONS WERE DONE INSIDE A HOOD WITH A FACE VELOCITY GREATER THAN 150 LFM. GLOVES WERE WORN AND NO PROCEDURES WERE VIOLATED. HE THEN REMOVED THE SOLUTION FROM THE HOOD AND ADDED IT TO A CHROMATOGRAPHY COLUMN OUTSIDE THE HOOD. THE COLUMN WAS TOO TALL TO FIT IN THE WORK HOOD. HE HAD ASSUMED THAT THERE WERE NO VOLATILES OR LABILE H-3 ATOMS AT THIS STAGE. TOTAL CALCULATED EXPOSURE WAS 37.5 MILLIREMS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FAILURE, OPERATOR ERROR + *COMPLIANCE + PERSONNEL EXPOSURE, RADIATION + RADIOCHEMICAL PROCESSING

063647
SEWAGE WATER CONTAMINATED AT NUCLEAR FUELS SERVICES, INC. (BETA, STRONTIUM, TRITIUM)
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, ALBANY, N.Y.
DOCKET-50201-73 +. 3 PAGES, LETTER TO NUCLEAR FUEL SERVICES, INC., DOCKET NO. 50-201 FROM NEW YORK STATE DEPT. OF ENVIRON. CONSERVATION, JUNE 8, 1971

N.Y. STATE AUTHORITIES RECOMMENDED THAT THE SOURCE BE DETERMINED AND THE CONTAMINATION BE ELIMINATED. IF THE SITUATION CANNOT BE CORRECTED, RECOMMENDED THAT THE SANITARY WASTE SYSTEM EFFLUENT BE SUBJECTED TO THE SAME CONTROLS THAT ANY OTHER RADIOACTIVE LIQUID WASTE WOULD BE, THAT IS, QUALIFICATION, QUANTIFICATION, FLOW CONTROL, AND ANY NEEDED TREATMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REGULATION, STATE + STRONTIUM + *COMPLIANCE + GROSS BETA + *CONTAMINATION + RADIOCHEMICAL PROCESSING + *NFS + FUEL REPROCESSING + *WASTE, SEWAGE

064095
PERSONNEL EXPOSURE TO AIRBORNE ACTIVITY
U.S. RADIUM CORPORATION, BLOOMSBURG, PA.
2 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) FROM U.S. RADIUM CORPORATION - MAY 21, 1970

POOR PLANNING FOR REPLACING A VALVE WHICH FAILED LED TO AN INDIVIDUAL EXPOSURE OF 11.8 MICRO CURIES/LITER OF TRITIUM (2.2 TIMES WEEKLY WORK LIMIT). NEW PROCEDURE CALLS FOR REPLACING ENTIRE VALVE INSTEAD OF THE FAILED PARTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FAILURE, OPERATOR ERROR + INHALATION + *BYPRODUCT MATERIAL + *COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION + FAILURE, ADMINISTRATIVE CONTROL

064457
NONCOMPLIANCE WITH RADIATION SAFETY STANDARDS AT U OF ILLINOIS
UNIVERSITY OF TRUSTEES, CHICAGO, ILLINOIS
2 PAGES, LETTER TO UNIVERSITY OF ILLINOIS FROM DIVISION OF COMPLIANCE (USAEC), MAY 19, 1971

AN INSPECTION ON MARCH 23-24, 1971, REVEALED THE FOLLOWING ITEMS - PERSONS WERE NOT INSTRUCTED IN RADIATION HAZARDS IN LABORATORIES USING RADIOACTIVITY MATERIAL. WORKERS WERE PERMITTED TO PIPETTE THE RADIOACTIVE SOLUTIONS BY MOUTH , TO STORE FOOD IN REFRIGERATORS CONTAINING TRITIUM AND TO DRINK COFFEE IN LABS USING RADIOISOTOPES. RECORDS OF PURCHASE, USE, TRANSFER, AND DISPOSAL OF RADIOACTIVE MATERIAL WERE NOT ADEQUATE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CARBON + IODINE + PROCEDURES AND MANUALS + BYPRODUCT MATERIAL + COMPLIANCE + *RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL + HOT LABORATORY + *COLLEGES AND UNIVERSITIES + RECORDS

064638
NATL. BUREAU OF STANDARDS REPORTS LOSS OF TWO STANDARD SAMPLES OF TRITIATED WATER
U.S. DEPARTMENT OF COMMERCE, NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.
2 PAGES, LETTER FROM NATIONAL BUREAU OF STANDARDS TO DIVISION OF COMPLIANCE (USAEC), JULY 13, 1971

SAMPLES WERE LOST IN TRANSIT TO AERE, HARWELL, ENGLAND. EACH CONTAINS ABOUT 7 MICROCURIES OF TRITIUM IN 50 ML OF HTO.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + TRANSPORTATION AND HANDLING + *COMPLIANCE + *SOURCE, RADIATION, LOST + NBS

064645
TITANIUM TRITIDE CONTAMINATES TABLE TOP
STATE OF ILLINOIS, DEPARTMENT OF PUBLIC HEALTH, SPRINGFIELD, ILLINOIS
2 PAGES, LETTER TO DIVISION OF COMPLIANCE (USAEC) FROM ILLINOIS DEPARTMENT OF HEALTH, MAY 14, 1971

IN THE PROCESS OF REMOVING THE FOIL FROM ONE OF THE KOVAR CELLS IN THE DETECTOR, SOME TITANIUM TRITIDE FLAKED OFF THE FOIL AND SPILLED TO THE TABLE TOP, WHICH WAS COVERED WITH PAPER TOWELS. THIS MATERIAL WAS QUITE RADIOACTIVE (TOO HOT TO GET A QUANTITATIVE COUNT WITH OUR INSTRUMENT). THE AREA WAS THEN DECONTAMINATED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*COMPLIANCE + *CONTAMINATION + *HOT LABORATORY

064649
LEAK IN PRIMARY HEAT EXCHANGER, NATL. BUR. STANDARDS RESEARCH REACTOR
U.S. DEPT. OF COMMERCE, NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.
DOCKET-50184-30 +. 1 PAGE, LETTER TO DIVISION OF REACTOR LICENSING (USAEC) FROM NATIONAL BUREAU OF STANDARDS, AUGUST 2, 1971, DOCKET 50-184

ON JULY 28, 1971, A LEAK DEVELOPED IN THE NBSR PRIMARY HEAT EXCHANGER. THE LEAK WAS INDICATED BY THE SECONDARY COOLANT MONITOR AND CONFIRMED BY SAMPLING ANALYSIS OF SECONDARY COOLANT. THE REACTOR WAS PROMPTLY SHUT DOWN AND THE HEAT EXCHANGER ISOLATED. AN ESTIMATED 20 CURIES OF TRITIUM WERE TRANSFERRED TO THE COOLING TOWER BASIN AND SECONDARY LINES AND VERY LITTLE, IF ANY, RELEASED TO THE ENVIRONMENT. THE LEAKING TUBE AS WELL AS ANY OTHER KNOWN POTENTIAL LEAKERS WILL BE PLUGGED AND CHECKED PRIOR TO RESUMING REGULAR OPERATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*REACTOR, RESEARCH + *NBS + FAILURE, TUBING + *LEAK + HEAT EXCHANGERS

064666
LOSS OF COMPASSES CONTAINING TRITIUM BY THE AIR FORCE
DEPARTMENT OF THE AIR FORCE, WRIGHT-PATTERSON AIR FORCE BASE, OHIO
5 PAGES, LETTER TO DIVISION OF COMPLIANCE (USAEC) FROM DEPARTMENT OF THE AIR FORCE, APRIL 15, 1971

32 EXCESS LENSATIC COMPASSES WERE ERRONEOUSLY TRANSFERRED TO THE TEXAS SURPLUS PROPERTY AGENT BY THE AIR FORCE IN SEPT. 1970. 26 WERE DISTRIBUTED. ALL BUT 1 WERE RECOVERED. 6 DISAPPEARED FROM STORAGE. EACH CONTAINED 120 MILLICURIES OF TRITIUM. THE TRANSFER WAS DUE TO HUMAN ERROR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FAILURE, OPERATOR ERROR + *BYPRODUCT MATERIAL + COMPLIANCE + INCIDENT, HUMAN ERROR + *SOURCE, RADIATION, LOST + FAILURE, ADMINISTRATIVE CONTROL

064826
FOUR OVEREXPOSED TO TRITIUM AT MIT RESEARCH REACTOR, MAY 24, 1971
MASSACHUSETTS INSITITUE OF TECHNOLOGY, CAMBRIDGE, MASSACHUSETTS
6 PAGES, LETTER TO DIVISION OF COMPLIANCE (USAEC) FROM MASS. INST. OF TECHNOLOGY, CAMBRIDGE, DOCKET 50-20, JULY 18, 1971

AS A SPENT ION-EXCHANGE WAS BEING ROLLED ON ITS STAND ACROSS THE EQUIPMENT ROOM FLOOR, IT STRUCK A 1/8-IN. PIPE DRAIN VALVE ATTACHED BY A SHORT NIPPLE TO THE UNDER SIDE OF A CHECK VALVE BODY LOCATED AT THE DISCHARGE END OF PRIMARY HEAT EXCHANGER NO. 1A. THE NIPPLE WAS BENT APPROXIMATELY 45 DEG, CAUSING IT TO CRACK ON ONE SIDE AND TO RELEASE A SPRAY OF TRITIATED D2O. TWELVE PERSONS IN THE REACTOR OPERATIONS AND MAINTENANCE GROUPS WERE EXPOSED IN SOME DEGREE TO THE AIRBORNE TRITIUM IN THE EQUIPMENT ROOM, AND THE SKIN OF AT LEAST THREE WAS KNOWN TO BE CONTACTED BY THE D2O LIQUID. BASED ON THE TRITIUM CONTENT OF URINE SAMPLES COLLECTED FROM THESE INDIVIDUALS, IT WAS DETERMINED THAT FOUR INDIVIDUALS WERE SUBJECT TO OVEREXPOSURE. *** CORRECTIVE STEPS WILL BE TAKEN TO PREVENT A RECURRENCE.

AIRBORNE RELEASE + FAILURE, OPERATOR ERROR + *REACTOR, RESEARCH + *PERSONNEL EXPOSURE, RADIATION + *MITR (RR) + COLLEGES AND UNIVERSITIES

065550
UNSCHEDULED RELEASE OF RADIOACTIVE WASTE AT POINT BEACH
WISCONSIN ELECTRIC POWER COMPANY, MILWAUKEE, WISCONSIN
DOCKET 50266-52 +. 3 PAGES, LETTER TO DIVISION OF REACTOR LICENSING FROM WISCONSIN ELECTRIC COMPANY, DOCKET 50-266, AUGUST 11, 1971, TYPE--PWR, MFG--WEST., AE--BECHTEL

WHILE FILLING THE UNIT-2 REFUELING WATER STORAGE TANK FROM THE UNIT 1 REACTOR MAKEUP TANK, THE STORAGE TANK OVERFLOWED TO THE SUMP AND RELEASED 6000 GAL INTO THE SEWAGE-RETENTION POND. SAMPLES FOR TRITIUM, GROSS BETA-GAMMA, AND IODINE INDICATED THAT THE RELEASE DID NOT EXCEED THE PERMISSIBLE CONCENTRATION. THE CAUSE OF THE OVERFLOW WAS THE MISCALIBRATION OF THE CONTROL-ROOM LEVEL INDICATOR FOR A 1000-IN. RANGE INSTEAD OF 800-IN. RANGE. THE LEVEL INSTRUMENT WAS THEN RECALIBRATED.

065550 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FISSION PRODUCT RELEASE + IODINE + REACTOR, PWR + WASTE DISPOSAL, LIQUID + INSTRUMENT, LIQUID LEVEL + *FAILURE, MAINTENANCE ERROR + POINT BEACH 1 (PWR) + INSTRUMENT, ABNORMAL INDICATION + SHUTDOWN COOLING SYSTEM

066691
TINNEY JF + MYERS DS + GUDIKSEN PF + YOCER RE
ENVIRONMENTAL SAMPLING PROGRAM FOLLOWING AN ACCIDENTAL TRITIUM RELEASE
LAWRENCE RADIATION LABORATORY, LIVERMORE, CALIFORNIA
UCRL-51029 +. 18 PAGES, MARCH 12, 1971

ON AUGUST 6, 1970, 289,000 CI OF TRITIUM GAS WAS ACCIDENTALLY RELEASED THROUGH AN EXHAUST STACK AT THE LAWRENCE RADIATION LABORATORY IN LIVERMORE, CALIFORNIA. SOON AFTER THE RELEASE, EMERGENCY-RESPONSE PERSONNEL SURVEYED THE SITE WITH PORTABLE TRITIUM AIR MONITORS AND AN EXTENSIVE ENVIRONMENTAL SAMPLING PROGRAM WAS INITIATED. THE RESULTS INDICATE THAT NO SIGNIFICANT EXPOSURE TO ON- OR OFF-SITE INDIVIDUALS RESULTED FROM THE RELEASE. ALL ENVIRONMENTAL SAMPLES OF WATER, MILK, AND URINE CONTAINED NORMAL BACKGROUND LEVELS OF TRITIUM. ALTHOUGH DETECTABLE LEVELS OF ACTIVITY WERE FOUND IN SOME VEGETATION AND ATMOSPHERIC WATER VAPOR SAMPLES, THE HIGHEST MEASURED CONCENTRATIONS AS WELL AS THE CALCULATED MAXIMUM CREDIBLE GROUND LEVEL AIR CONCENTRATIONS DURING CLOUD PASSAGE WERE WELL BELOW THE OFF-SITE MAXIMUM PERMISSIBLE CONCENTRATIONS FOR CONTINUOUS EXPOSURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT + MPC + *WATER + *SAMPLING + MILK + *MONITOR, ENVIRONMENTAL + *POPULATION EXPOSURE + LRL + CRITICAL NUCLIDE PATHWAY + RADIOACTIVITY RELEASE + VEGETATION + *CONCENTRATION + EXCRETION, URINE + CLOUD + RADIATION MONITORS

066846
HEAT EXCHANGER TUBE LEAK AT NBS
U.S. DEPARTMENT OF COMMERCE, NATIONAL BUREAU OF STANDARDS
1 PAGE, LETTER - NATIONAL BUREAU OF STANDARDS TO DIVISION OF REACTOR LICENSING (AEC) - DECEMBER 8, 1971, DOCKET 50-184

NBS REPORTS 2 TUBES PLUGGED ON HEAT EXCHANGER AFTER DETECTING SMALL LEAK OF HEAVY WATER. LESS THAN ONE CURIE OF TRITIUM WAS TRANSFERRED TO SECONDARY SYSTEM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

HEAVY WATER + REACTOR, HWR + REACTOR, RESEARCH + NBS + *FAILURE, TUBING + LEAK + HEAT EXCHANGERS

067194
LAMBERT BE + SHARPE HBA + DAWSON KB
ACCIDENTAL INTAKE OF TRITIATED WATER (HPIS/63)
RADIOLOGICAL PROTECTION SERVICE, ENGLAND
5 PAGES, AMER. IND. HYG. ASSOC. JOURNAL, NO. 32, PP. 682-686 (1971)

DURING A ROUTINE OPERATION INVOLVING TRITIUM GAS AT A FACTORY MANUFACTURING TRITIUM-FILLED INSTRUMENT ILLUMINATORS AN EMPLOYEE WAS ACCIDENTLY EXPOSED FOR 10 MIN TO LEAKAGE FROM A FLASK CONTAINING 500 CI OF H3. URINARY MONITORING STARTING THIRD DAY POST-INCIDENT, ABSORPTION THOUGHT TO BE VIA SKIN AS TRITIUM GAS AND/OR TRITIATED WATER, TOTAL INITIAL BODY BURDEN OF TRITIUM CALCULATED TO BE ABOUT 350 MCI FOR THE 73 KG MAN, AGE 30, WITH ASSUMED TOTAL BODY WATER VOLUME OF 38 LITERS. DOSE TO HIS BODY TISSUES FROM TRITIATED WATER WAS ESTIMATED TO BE ABOUT 30 RADS. THE MICROCURIE OF TRITIUM PER GM OF URINE BETWEEN 3 AND 160 DAYS WAS REPRESENTED BY 9.1 E (EXP - 0.693T/9.1) + 6.6 TIMES 10 (EXP -2) E(EXP -0.693T/36) IN GOOD AGREEMENT WITH SNYDER (NSIC/49605). OF OSBORNE (NSIC/56159). DICENTRIC ABERRATIONS IN HIS LYMPHOCYTES WERE FROM 4 TO 12 PER 200 OR 300 CELLS EXAMINED BETWEEN 12 AND 94 DAYS, FOR AN INTEGRATED BLOOD DOSE OF 20 TO 30 RADS.

ACCIDENT + BIOMEDICAL + OXIDE + INDUSTRY, MANUFACTURING + *DOSE CALCULATION, INTERNAL + PERSONNEL EXPOSURE, RADIATION + *ABSORPTION + ANIMAL, VERTEBRATE + *CHROMOSOMAL EFFECT + DISTRIBUTION + BLOOD + RADIATION EFFECT + LUMINARY + EXCRETION, URINE + EXPONENTIAL FUNCTION + MAN + MATURE + *SKIN + MALE + BODY BURDEN + IC GROSSLY NORMAL + RETENTION FUNCTION + BODY FLUID + MONTH + HEMATOLOGY

068458
CHEMIST RECEIVES INTERNAL EXPOSURE FROM TRITIUM
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
1 PAGE, LETTER - NEW ENGLAND NUCLEAR CORPORATION TO DIVISION OF COMPLIANCE - OCTOBER 25, 1971

A CHEMIST PERFORMING AN EXPERIMENT RECEIVED AN INTERNAL DOSE OF 186 MILLIREMS. EXPOSURE WAS THROUGH THE SKIN. A PLASTIC GLOVE HAD SEPARATED AT THE SEAL. A URINE SAMPLE SHOWED AN INCREASE OF 4.9 MICROCURIES PER LITER.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FAILURE + PERSONNEL PROTECTIVE DEVICE + BYPRODUCT MATERIAL + *PERSONNEL EXPOSURE, RADIATION + RADIOCHEMICAL PROCESSING + ABSORPTION

068987
REPORT OF PERSONNEL EXPOSURE
NEW ENGLAND NUCLEAR CORPORATION, BOSTON, MASSACHUSETTS
2 PAGES, LETTER - NEW ENGLAND NUCLEAR CORPORATION TO DIVISION OF COMPLIANCE (AEC) - JULY 16, 1971

A CHEMIST RECEIVED INTERNAL EXPOSURE OF 20 MILLIREMS FROM TRITIUM WHILE PREPARING A COMPOUND. CAUSE WAS OVERUSE OF PLASTIC GLOVES, WHICH HAD NOT BEEN CHANGED OFTEN ENOUGH, FAILURE OF WORKERS TO DECONTAMINATE GLASSWARE, AND OVERCROWDING OF HOODS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FAILURE, OPERATOR ERROR + INHALATION + BYPRODUCT MATERIAL + *PERSONNEL EXPOSURE, RADIATION + RADIOCHEMICAL PROCESSING + FAILURE, ADMINISTRATIVE CONTROL

069892
ELECTRONS CO. ALLOWED TOO MUCH TIME BETWEEN LEAK TESTS
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
1 PAGE, LETTER - DIVISION OF COMPLIANCE (AEC) TO ELECTRONS COMPANY, FAIRFIELD, NEW JERSEY - MARCH 20, 1972

SEVENTY-NINE SEALED SOURCES CONTAINING 18 MICROCURIES OF AM-241 APIECE WERE LAST LEAK-TESTED IN OCTOBER 1970, A PERIOD OF 15 MONTHS. ALSO, 106 SIMILAR UNITS WERE LAST LEAK-TESTED IN APRIL 1971, A PERIOD OF NINE MONTHS. REGULATIONS CALL FOR 6-MONTH INTERVALS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + *SOURCE, RADIATION + *COMPLIANCE + AMERICIUM + *TEST INTERVAL + *TEST, LEAK

072428
ACCIDENT ANALYSIS - RUPTURE OF SIRW TANK (PALISADES POINT)
CONSUMERS POWER COMPANY
3 PAGES, LETTER - CONSUMERS POWER COMPANY TO DEPUTY DIRECTOR FOR REACTOR PROJECTS (AEC) - JUNE 22, 1972, DOCKET 50-255, TYPE--PWR, MFG--CCMB., AE--BECHTEL

IF TANK RUPTURES, 2600 CURIES OF TRITIUM COULD BE RELEASED TO LAKE MICHIGAN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCIDENT ANALYSIS + *WASTE DISPOSAL, LIQUID + CONTAMINATION + *STORAGE CONTAINER + *PALISADES (PWR) + LAKE MICHIGAN

074185
EXPOSURE TO TRITIUM AT UNITED STATES RADIUM CORP.
UNITED STATES RADIUM CORPORATION, PENNSYLVANIA
2 PAGES, LETTER - U. S. RADIUM CORPORATION TO DIVISION OF COMPLIANCE

TRITIUM URINE SAMPLES FOR AN EMPLOYEE SHOWED AN INCREASE THAT INDICATED AN EXPOSURE OF 2.6 TIMES THE WORK-WEEK LIMIT. A TUBE CONTAINING TRITIUM DEVELOPED A HAIR-LINE CRACK WHILE STORED IN A CABINET. THE CABINET WAS NOT PROPERLY VENTILATED. WHEN THE WORKER OPENED THE CABINET, SHE WAS EXPOSED. A FAN WILL BE INSTALLED IN THE CABINET.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FAILURE, EQUIPMENT + INHALATION + BYPRODUCT MATERIAL + *COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION + STORAGE CONTAINER + RADIOCHEMICAL PROCESSING + FAILURE, DESIGN ERROR

076230
FLOOD DAMAGE AT U.S. RADIUM CORP.
UNITED STATES RADIUM CORPORATION
2 PAGES, LETTER TO DIVISION OF COMPLIANCE (AEC), JUNE 29, 1972

DURING THE FLOOD OF JUNE 22-26, THE EVAPORATOR HOUSE WAS SUBMERGED. A TANK CONTAINING 500 GAL OF TRITIATED WATER WAS FLOODED. WATER PUMPED FROM THE EVAPORATOR HOUSE CONTAINED 0.007 MICROCURIE/ML OF TRITIUM. NO OTHER RADIOACTIVE MATERIAL WAS PRESENT AT THE TIME OF FLOODING. CONTAMINATED WATER IS BEING STORED IN DRUMS UNTIL THE EVAPORATOR SYSTEM IS RESTORED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + WASTE STORAGE + STORAGE CONTAINER + *RADIOACTIVITY RELEASE + RADIOCHEMICAL PROCESSING + FAILURE, DESIGN ERROR + WASTE TREATMENT, EQUIPMENT + DAMAGE + WEATHER, SEVERE + *FLOOD

076467
EMPLOYEE WORKED IN HIGH AIR CONCENTRATION OF TRITIUM (4 TIMES THE MPC FOR AIR)

076467 *CONTINUED*
TEMPLE UNIVERSITY, PHILADELPHIA, PA., 19140
14 PAGES, LETTER TO USAEC MATERIALS LICENSING, OCT. 5, 1972

OPENED THE STOCK CYLINDERS ON 9/7 AND 9/11 IN THE HOT LAB (NOT IN THE HOOD) TO PLACE THE AMPULES IN THE TANK. IT WAS AT THIS POINT OF THE PROCEDURE THAT HE RECEIVED THE H-3 EXPOSURE AND WAS IN AIR CONCENTRATIONS GREATER THAN MPC. PLANT MANAGER INITIATED A STRICT PROTOCOL TO BE FOLLOWED WHENEVER H-3 IS BEING USED AT AIRCO. ALL CYLINDERS WILL BE WASHED DOWN AND ANY RESIDUAL GAS REMAINING REMOVED BY VACUUM INTO A WASTE STORAGE TANK.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + INHALATION + BYPRODUCT MATERIAL + *COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION + COLLEGES AND UNIVERSITIES

076509
CHEMIST EXPOSED TO TRITIATED WATER
NEW ENGLAND NUCLEAR CORP.
2 PAGES, LETTER TO DIVISION OF COMPLIANCE (AEC), SEPT. 25, 1972

DURING THE PERIOD FROM AUGUST 28, 1972 THROUGH SEPTEMBER 21, 1972, A CHEMIST SHOWED AN INTERNAL UPTAKE OF TRITIUM. THE COMMITTEE CONCLUDED THAT THE EXPOSURE RESULTED WHEN TRITIATED WATER VAPOR WAS RELEASED TO THE GLOVE BOX ATMOSPHERE AFTER HEATING THE BATH TO 100 C. THE AIRBORNE WATER VAPOR WAS ABSORBED THROUGH THE SKIN OR INGESTED WHEN THE CHEMIST OPENED THE PORT AND REMOVED THE WASTE CONTAINER. CALCULATED UPTAKE WAS 0.455 MILLICURIE. CORRECTIVE ACTION - REDESIGN THE BOX SYSTEM TO INCLUDE A HUMIDIFIER TO ASSIST IN OVERNIGHT CLEANING.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + BYPRODUCT MATERIAL + *COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION

076525
STUDENT OVEREXPOSED TO TRITIUM AT UNIVERSITY OF VIRGINIA
UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE, VIRGINIA 22901
14 PAGES, LETTER WITH ATTACHMENTS TO DIVISION OF COMPLIANCE (AEC), AUG. 30, 1972

THE MISHAP INVOLVED THE FAILURE OF A SILVER SOLDER JOINT BETWEEN THE PLATINUM END CAP AND THE STAINLESS STEEL TUBE OF A TRITIUM GAS CELL WHICH ALLOWED THE RELEASE OF APPROXIMATELY 13 CURIES OF TRITIUM GAS. BIOASSAY ANALYSIS FOR TRITIUM OF THE 24 HOUR URINE SAMPLE SUBMITTED BY THE GRADUATE STUDENT INVOLVED IN THIS INCIDENT RESULTED IN A VALUE OF 0.8 MICROCURIE/LITER OF URINE. FROM THIS ONE CALCULATES THE TOTAL INITIAL BODY BURDEN TO BE 34.8 MICROCURIES AND THE INFINITY DOSE TO BE 2.5 MREM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + *COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION + COLLEGES AND UNIVERSITIES

077252
RESPONSE TO AEC LETTER ABOUT APPARENT NONCOMPLIANCE (WARNER-LAMBERT RES. INST.)
WARNER-LAMBERT RESEARCH INSTITUTE, MORRIS PLAINS, NEW JERSEY 07950
2 PAGES, LETTER TO DIRECTORATE OF REGULATORY OPERATIONS, NOV. 29, 1972

ITEMS - FAILED TO ESTABLISH VALID RELATION BETWEEN INDIVIDUAL'S ELIMINATION AND INTAKE OF TRITIUM; DISCARDED WASTE (250 MICROCURIES TRITIUM, 50 OF C-14) AS NORMAL REFUSE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

CARBON + FAILURE, OPERATOR ERROR + BYPRODUCT MATERIAL + *WASTE DISPOSAL + *COMPLIANCE + PERSONNEL EXPOSURE, RADIATION + FAILURE, ADMINISTRATIVE CONTROL

077662
IMPORTATION OF COMPASSES CONTAINING TRITIUM BY SILVA
SILVA, INC., LA PORTE, INDIANA 46350
1 PAGE, LETTER TO DIRECTOR OF REGULATORY OPERATIONS (AEC), NOV. 15, 1972

SILVA, INC., IMPORTED 583 COMPASSES CONTAINING 10 MILLICURIES OF TRITIUM EACH. THE COMPANY OBTAINED A LICENSE TO POSSESS THIS MATERIAL AND IS APPLYING FOR LICENSE TO DISTRIBUTE THE COMPASSES AND IMPORT OTHERS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*LICENSE STATUS + *BYPRODUCT MATERIAL + TRANSPORTATION AND HANDLING + COMPLIANCE + FAILURE, ADMINISTRATIVE CONTROL

077983
TWO TRITIUM EXPOSURE INCIDENTS AT NEW ENGLAND NUCLEAR CORPORATION
NEW ENGLAND NUCLEAR CORP., BOSTON, MASS. 02118
5 PAGES, LETTER WITH ATTACHMENTS TO DIVISION OF COMPLIANCE (AEC), NOV. 29, 1972.

(1) A WORKER RECEIVED A CALCULATED INTERNAL EXPOSURE OF 0.67 REM OF TRITIUM. EXPOSURE RESULTED FROM INGESTION AND SKIN ABSORPTION. HE WAS REPAIRING A FACULTY VACUUM MANIFOLD. GLOVES WERE WORN. (2) WHILE CHANGING THE TRITIUM-CONTAMINATED OIL IN 7 VACUUM PUMPS, A WORKER WAS EXPOSED WHEN HE GOT OIL ON HIS HANDS THROUGH A HOLE IN GLOVES. CALCULATED EXPOSURE WAS 0.37 REM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FAILURE + INGESTION + *MAINTENANCE AND REPAIR + PERSONNEL PROTECTIVE DEVICE + BYPRODUCT MATERIAL + COMPLIANCE + *PERSONNEL EXPOSURE, RADIATION + RADIOCHEMICAL PROCESSING + EXPOSURE, SKIN

077993
TRITIUM SOURCE LOST IN SHIPMENT TO TEMPLE UNIVERSITY
TEMPLE UNIVERSITY, PHILADELPHIA, PENNSYLVANIA 19140
2 PAGES, LETTER TO DIVISION OF COMPLIANCE (AEC), NOV. 14, 1972

50 MILLICURIES OF TRITIUM WAS LOST DURING SHIPMENT. THE FREIGHT BILL LISTED 2 PACK[illegible], BUT THE MAN SIGNING FOR DELIVERY DID NOT NOTICE THAT 2 PACKAGES WERE LISTED. RECORDS INDIC[illegible] ONLY 1 PACKAGE DELIVERED. THE LOST PACKAGE COULD NOT BE LOCATED AT THE UNIVERSITY, THE CARRIER, OR THE VENDOR. INTAKE OF 1 OF THE 10 MISSING VIALS WOULD NOT PRODUCE AN EXCESS BODY BURDEN.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FAILURE, OPERATOR ERROR + BYPRODUCT MATERIAL + TRANSPORTATION AND HANDLING + COMPLIANCE + *SOURCE, RADIATION, LOST + RADIOLOGY + COLLEGES AND UNIVERSITIES + RADIOPHARMACEUTICAL

078456
TECHNICIAN RECEIVES INTERNAL TRITIUM EXPOSURE
NEW ENGLAND NUCLEAR CORP., BOSTON, MASS. 02118
2 PAGES, LETTER TO DIVISION OF COMPLIANCE (AEC), NOV. 6, 1972

TECHNICIAN RECEIVED AN INTERNAL EXPOSURE OF 20 MREM FROM TRITIUM. OPERATIONS WERE CARRIED OUT INSIDE A CONVENTIONAL GLOVE BOX. EXPOSURE WAS DUE TO INHALATION AS A RESULT OF CONSTANTLY OPENING A SIDE PORT DIRECTLY TO THE BOX INTERIOR. STUDIES SHOWED THAT AIR LEAVING THE BOX FROM THIS PORT WOULD FLOW TOWARD THE FACE OF THE HOOD BEFORE IT ENTERED THE STACK DISCHARGE SYSTEM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FAILURE, EQUIPMENT + GLOVE BOX + INHALATION + BYPRODUCT MATERIAL + *PERSONNEL EXPOSURE, RADIATION

078594
PROBABLE LOSS OF TRITIUM DURING SHIPMENT
UNITED NUCLEAR CORP., NEW HAVEN, CONN.
1 PAGE, LETTER TO DIRECTORATE OF REGULATORY OPERATIONS (AEC), FEB. 2, 1973

AMERICAN AIRLINES REPORTED THE PROBABLE LOSS OF 20 CI OF TRITIUM IN A TITANIUM NEUTRON-GENERATOR TUBE. NO HAZARD TO THE GENERAL PUBLIC EXISTS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FAILURE + BYPRODUCT MATERIAL + *TRANSPORTATION AND HANDLING + COMPLIANCE + *SOURCE, RADIATION, LOST

078991
POWER REACTOR REGULATION -- HARRIS PLANT, EPA CONCERNS
3 PAGES, ATOMIC ENERGY CLEARING HOUSE, 19(8), PP. 2-4 (FEBRUARY 19, 1973)

EPA REPORTS WITH REGARD TO SHEARON HARRIS FACILITY, UNITS 1-4, THAT ITS PRINCIPAL CONCERN IS THAT RADIOIODINE DISCHARGES WILL NOT BE IN COMPLIANCE WITH AEC'S PROPOSED APPENDIX I TO PART 50 THOUGH IT IS ALSO CONCERNED ABOUT DISPOSAL OF RECYCLED TRITIATED LIQUIDS AND RETAINED NOBLE GASES. IT ALSO QUESTIONS THE ABILITY OF THE PROPOSED ONCE-THROUGH COOLING SYSTEM TO MEET WATER-QUALITY STANDARDS.

CODES AND STANDARDS + IODINE + NOBLE GAS + REGULATION, AEC + RADIOACTIVITY RELEASE + WATER QUALITY + POWER PLANT, NUCLEAR + *REPORT, ENVIRONMENTAL + *ENVIRONMENTAL PROTECTION AGENCY (EPA) + *SHEARON HARRIS 2 (PWR) *SHEARON HARRIS 3 (PWR) + *SHEARON HARRIS 4 (PWR)

080114
VIOLATION OF CONTAINMENT AT YANKEE ROWE (AO 73-1)

080114 *CONTINUED*
YANKEE ATOMIC ELECTRIC COMPANY
1 PAGE, LETTER TO DIVISION OF REGULATORY OPERATIONS (AEC), APRIL 2, 1973, DOCKET 50-29, TYPE--PWR, MFG--WEST., AE--STONE AND WEBSTER

A CONTRACTOR EMPLOYEE OPENED THE VAPOR-CONTAINER PERSONNEL-HATCH OUTER DOOR WITH THE INNER DOOR ALREADY OPEN WHILE THE REACTOR WAS AT 680 PSI AND 400 F. DURING THIS 2-MIN BREACH OF VAPOR-CONTAINER INTEGRITY, THERE WAS A RELEASE OF TRITIUM VAPOR.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + FAILURE + REACTOR, PWR + YANKEE ROWE (PWR) + *CONTAINMENT INTEGRITY + RADIOACTIVITY RELEASE + *FAILURE, MAINTENANCE ERROR

084741
TECHNICIAN EXPOSED TO TRITIUM AT NEW ENGLAND NUCLEAR
NEW ENGLAND NUCLEAR CORPORATION
2 PAGES, LETTER TO DIVISION OF COMPLIANCE (AEC), AUGUST 14, 1973

A TECHNICIAN REMOVED A LIQUID-NITROGEN COLD BATH FROM A GLASS WASTE FLASK DURING A FLAME-SEALING OPERATION TO GET A BETTER GRIP ON THE CONTAINER. HEAT FROM HIS HAND WARMED THE LIQUID, PUTTING PRESSURE ON THE MOLTEN GLASS. THE OPERATION WAS IN A HOOD, AND GLOVES WERE WORN. HE WAS EXPOSED TO A CALCULATED 269 MREM OF TRITIUM. NEW EQUIPMENT TO AUTOMATE THIS PROCEDURE WILL BE INSTALLED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FAILURE, OPERATOR ERROR + BYPRODUCT MATERIAL + *COMPLIANCE + MODIFICATION + *PERSONNEL EXPOSURE, RADIATION + RADIOLOGY

084798
CORRECTIVE ACTION TO VIOLATIONS OF AEC REQUIREMENTS
UNITED STATES RADIUM CORPORATION
2 PAGES, LETTER TO DIRECTORATE OF REGULATORY OPERATIONS, REGION 1 (AEC), APRIL 23, 1973

ITEMS INCLUDED: (1) STACK RELEASES OF TRITIUM WHICH EXCEEDED THE LIMITS FOR THE YEAR 1971 BY A FACTOR OF 17.46 AND FOR 1972 BY A FACTOR OF 15.8, AND (2) THERE WAS NO DOCUMENTATION OF TRAINING NOR HAD EVACUATION DRILLS BEEN PERFORMED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + *COMPLIANCE + RADIOACTIVITY RELEASE + FAILURE, ADMINISTRATIVE CONTROL + *REPORT, NRC INSPECTION

084823
CORRECTIVE ACTION TO VIOLATIONS OF AEC REQUIREMENTS
PANAMETRICS
3 PAGES, LETTER TO DIRECTORATE OF REGULATORY OPERATIONS, REGION 1 (AEC), AUGUST 20, 1973

REPORTS CORRECTIVE ACTION TO THE FOLLOWING APPARENT VIOLATIONS (1) FAILED TO GIVE 24 HR NOTIFICATION TO AEC CONCERNING A TRITIUM RELEASE, (2) FAILED TO MAKE SURVEYS OF TRITIUM DISCHARGED FROM PLANT, (3) AVAILABLE COPY OF CODE OF FEDERAL REGULATIONS 10CFR20 HAS SIGNIFICANTLY OUTDATED, AND (4) GAVE INADEQUATE INFORMATION IN A REPORT TO AEC.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

BYPRODUCT MATERIAL + *COMPLIANCE + *FAILURE, ADMINISTRATIVE CONTROL + REPORT, NRC INSPECTION

084884
CIVIL PENALITIES IMPOSED ON THEODORE R. SCHWALM, INC.
U.S. ATOMIC ENERGY COMMISSION
2 PAGES, LETTER TO THEODORE R. SCHWALM, INC., OCTOBER 12, 1973

CIVIL PENALITIES OF $1250 WERE IMPOSED FOR FAILURE TO CONTROL THE RELEASE OF TRITIUM TO THE ATMOSPHERE IN UNRESTRICTED AREAS. THIS PROBLEM HAD BEEN BROUGHT TO THE COMPANY'S ATTENTION ON FIVE PREVIOUS INSTANCES.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*AIRBORNE RELEASE + BYPRODUCT MATERIAL + *COMPLIANCE + POPULATION EXPOSURE + FAILURE, ADMINISTRATIVE CONTROL + AGENCY, AEC + *LEGALISTICS

085935
CIVIL PENALTY IMPOSED ON THEODORE R. SCHWALM, INC., FOR EXCESSIVE TRITIUM RELEASES
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
5 PAGES, LETTER WITH ATTACHMENT TO THEODORE R. SCHWALM, INC., OCTOBER 12, 1973

CIVIL PENALTIES OF $1250 WERE IMPOSED FOR 3 ITEMS OF NONCOMPLIANCE. THE AVERAGE CONCENTRATION OF TRITIUM IN EFFLUENT AIR RELEASED TO UNRESTRICTED AREAS EXCEEDED LIMITS. FAILURE TO LIMIT THESE CONCENTRATIONS HAVE BEEN BROUGHT TO THE COMPANY ATTENTION 5 TIMES OVER A 5-YR PERIOD. THE RESPONSE TO THE LAST CITATION WAS NOT CONSIDERED SATISFACTORY. AIR SAMPLING WATER TRAPS WERE RELEASED WITHOUT EVALUATION. WATER SAMPLES WERE SHIPPED WITHOUT BEING HANDLED PROPERLY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + EFFLUENT + RELEASE RATE + BYPRODUCT MATERIAL + COMPLIANCE + SAMPLING + RADIOCHEMICAL PROCESSING + LEGALISTICS

086176
LOSS OF EMERGENCY EXIT SIGN CONTAINING TRITIUM BY THE AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO
3 PAGES, LETTER TO DIVISION OF COMPLIANCE, REGION 1 (AEC), OCTOBER 1, 1973

AIRCRAFT EMERGENCY EXIT SIGNS CONTAINING 4 CURIES OF TRITIUM EACH WERE REMOVED FROM AIRCRAFT AT WRIGHT-PATTERSON AIR FORCE BASE. LAND BURIAL OF RADIOACTIVE MATERIAL IS NOT AUTHORIZED. HOWEVER, SOME OF THE ESTIMATED 600 SIGNS REMOVED WERE DISPOSED OF IN THE SANITARY LANDFILL. OTHERS WERE GIVEN TO FAMILY AND FRIENDS OF THE MEN WHO REMOVED THEM. ONLY A FEW HAVE BEEN REMOVED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FAILURE, OPERATOR ERROR + PROCEDURES AND MANUALS + BYPRODUCT MATERIAL + WASTE DISPOSAL + COMPLIANCE + FAILURE, ADMINISTRATIVE CONTROL + MILITARY CONSIDERATION

087511
REPORT OF PERSONNEL EXPOSURE
UNITED STATES RADIUM CORPORATION, PENNSYLVANIA
1 PAGE, LETTER TO DIRECTORATE OF REGULATORY OPERATIONS (AEC), NOVEMBER 30, 1973

REPORTS THE EXPOSURE OF AN INDIVIDUAL TO AIRBORNE TRITIUM.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

INHALATION + BYPRODUCT MATERIAL + *PERSONNEL EXPOSURE, RADIATION

097789
EXPOSURE OF EMPLOYEE TO TRITIUM AT HOFFMANN-LA ROCHE
HOFFMANN-LA ROCHE INC., NEW JERSEY
1 PAGE, LETTER TO DIRECTORATE OF REGULATORY OPERATIONS (AEC), OCTOBER 9, 1974

CAUSE - EQUIPMENT FAILURE. THE ACCIDENTAL IMPLOSION OF A VACUUM FLASK RELEASED 7 CI OF TRITIUM IN THE FORM OF ACETIC ACID. THE EMPLOYEE WAS EXPOSED TO AIRBORNE CONCENTRATION OF TRITIUM WHICH WERE 38% IN EXCESS OF OCCUPATIONAL LIMITS. IN THE FUTURE, ALL VACUUM WILL BE INSPECTED FOR FLAWS PRIOR TO USE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*AIRBORNE RELEASE + *FAILURE, EQUIPMENT + FAILURE + INHALATION + BYPRODUCT MATERIAL + COMPLIANCE + PERSONNEL EXPOSURE, RADIATION + RADIOPHARMACEUTICAL

098560
TRITIUM LEVEL IN RIVER SAMPLE EXCEEDS CONTROL VALVE AT THREE MILE ISLAND 1
METROPOLITAN EDISON CO., READING, PA.
4 PAGES, LETTER WITH REPORT TO DIRECTORATE OF REGULATORY OPERATIONS (AEC), REGION I, DECEMBER 24, 1974, DOCKET 50-289, TYPE--PWR, MFG--B+W, AE--GILBERT ASSOC.

CAUSE - MINOR LEAKS. A MONTHLY COMPOSITE RIVER WATER SAMPLE COLLECTED 1/2 MILE BELOW THE DISCHARGE FROM THE PLANT WAS MORE THAN 4 TIMES THE CONTROL STATION VALUE FOR TRITIUM. A SAMPLE COLLECTED ONE WEEK LATER WAS AGAIN NORMAL. THERE WERE LOSSES IN REACTOR COOLANT INVENTORY THROUGH VARIOUS COMPONENTS CONNECTED TO THE PRIMARY DRAIN TANK VIA LEAK-OFF LINES. REPAIRS HAVE BEEN MADE TO THESE COMPONENTS. THE LEVEL WAS LESS THAN 1% MPC.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

FAILURE + REACTOR, PWR + *RIVER + *REACTOR COOLANT + SAMPLING + RADIOACTIVITY RELEASE + MONITORING PROGRAM,

098560 *CONTINUED*
ENVIRONMENTAL + LEAK + THREE MILE ISLAND 1 (PWR)

099674
QUARTERLY SAMPLE FOR TRITIUM NOT TAKEN ON TIME AT COOPER
NEBRASKA PUBLIC POWER DISTRICT
1 PAGE, LETTER TO AEC DIRECTORATE OF REGULATORY OPERATIONS, REGION 4, FEBRUARY 3, 1975, DOCKET 50-298, TYPE--BWR, MFG--G.E., AE--BURNS & ROE

CAUSE - NOT SCHEDULED PROPERLY. THE QUARTERLY SAMPLING DEADLINE FOR TRITIUM ANALYSIS OF THE OFF GAS VENT PIPE WAS EXCEEDED BY 7 DAYS. THE APPARENT CAUSE WAS ATTRIBUTED TO FAILURE OF RESPONSIBLE PERSONNEL IN THE CHEMISTRY DEPARTMENT TO MONITOR THE APPROACHING DEADLINE AND INITIATE SAMPLING PRIOR TO THAT DEADLINE. THE REQUIRED SAMPLE WAS TAKEN AND ANALYZED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

REACTOR, BWR + FAILURE + *SAMPLING + STACK + OFF GAS + FAILURE, ADMINISTRATIVE CONTROL + *TEST INTERVAL + COOPER (BWR)

100916
TRITIUM LEAKING FROM PENETRATION AT FT. ST. VRAIN
PUBLIC SERVICE CO. OF COLORADO
4 PAGES, LETTER WITH AO REPORT 75/4-A TO NRC OFFICE OF INSPECTION & ENFORCEMENT, MARCH 14, 1975, DOCKET 50-267, TYPE--HTGR, MFG--G.A., AE--G.A.

CAUSE - SYSTEM DESIGN. THE SECONDARY CLOSURE PLATE ON REFUELING PENETRATION 1 WAS BEING REMOVED TO EXAMINE THE RESERVE SHUTDOWN PRESSURIZING LINE FOLLOWING MODIFICATIONS TO THE LINE. TRITIUM LEVELS AROUND THE SECONDARY SEAL INCREASED TO TWICE BACKGROUND INDICATING A POSSIBLE PRIMARY COOLANT LEAK. THE CLOSURE PLATE WAS RETIGHTENED. DURING DEPRESSURIZATION OF THE PRIMARY COOLANT SYSTEM, HELIUM IS BLED FROM THE PURIFICATION SYSTEM TO THE STORAGE BOTTLE AHEAD OF THE HYDROGEN GETTER UNIT; THEREFORE, THE INCREASE IN TRITIUM WAS DUE TO THE NORMAL PRESENCE OF TRITIUM IN THE PRESSURIZING GAS, NOT TO A LEAK.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AIRBORNE RELEASE + FAILURE + REACTOR STARTUP EXPERIENCE + COOLANT PURIFICATION SYSTEM + FT. ST. VRAIN (HTGR) + SYSTEM OPERABILITY IN ACCIDENT + REACTOR, HTGR

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

ABSORPTION
047229 P 11 067194 P 17 068458 P 17
ACCELERATOR
011788 P 2
ACCIDENT
047229 P 11 066691 P 17 067194 P 17
ACCIDENT ANALYSIS
072428 P 18
ACCIDENT, RADIOISOTOPE
037494 P 8
ADMINISTRATIVE CONTROL
008009 P 1 014861 P 2
AGENCY, AEC
084884 P 21
AIRBORNE RELEASE
015311 P 3 016404 P 4 016661 P 4 020722 P 5
021658 P 6 021718 P 6 025349 P 6 028573 P 7
030279 P 7 038078 P 8 038079 P 8 047157 P 11
048187 P 12 055009 P 13 064826 P 16 076467 P 18
076509 P 19 080114 P 20 084884 P 21 085939 P 22
097789 P 22 100916 P 23
ALUMINUM
060110 P 14
AMERICIUM
025349 P 6 069892 P 18
ANALYTICAL TECHNIQUE
038079 P 8
ANIMAL, VERTEBRATE
049549 P 13 049659 P 13 067194 P 17
BIOLOGICAL HALF-LIFE
049549 P 13
BIOMEDICAL
067194 P 17
BLOOD
047229 P 11 067194 P 17
BODY BURDEN
067194 P 17
BODY FLUID
047229 P 11 067194 P 17
BYPRODUCT MATERIAL
010408 P 1 010831 P 2 025349 P 6 028573 P 7
029142 P 7 030279 P 7 036066 P 7 039821 P 9
041148 P 9 041159 P 9 041359 P 9 041365 P 10
041560 P 10 041562 P 10 041563 P 10 044641 P 11
044648 P 11 047157 P 11 048187 P 12 048251 P 12
048261 P 12 048268 P 12 049915 P 13 057036 P 13
059951 P 14 063198 P 14 064095 P 15 064457 P 15
064638 P 15 064666 P 16 068458 P 17 068987 P 18
069892 P 18 074185 P 18 076230 P 18 076467 P 18
076509 P 19 076525 P 19 077252 P 19 077662 P 19
077983 P 20 077993 P 20 078456 P 20 078594 P 20
084741 P 21 084798 P 21 084823 P 21 084884 P 21
085939 P 22 086176 P 22 087511 P 22 097789 P 22
CARBON
018385 P 5 064457 P 15 077252 P 19
CHEMICAL REACTION
021718 P 6
CHLORINE
016404 P 4
CHROMIUM
059951 P 14
CHROMOSOMAL EFFECT
047229 P 11 067194 P 17
CLADDING
060110 P 14
CLOUD
066691 P 17
COBALT
049659 P 13
CODES AND STANDARDS
078991 P 20
COLLEGES AND UNIVERSITIES
010831 P 2 041159 P 9 048261 P 12 064457 P 15
064826 P 16 076467 P 18 076525 P 19 077993 P 20
COMPLIANCE
010376 P 1 010408 P 1 010640 P 1 010831 P 2
011949 P 2 016660 P 4 017116 P 4 020619 P 5
020620 P 5 025349 P 6 029142 P 7 030279 P 7
036066 P 7 038745 P 8 039429 P 8 040450 P 9
041148 P 9 041159 P 9 041359 P 9 041365 P 10
041560 P 10 041562 P 10 041563 P 10 047157 P 11
048187 P 12 048251 P 12 048268 P 12 049915 P 13
055009 P 13 057036 P 13 059951 P 14 063198 P 14
063637 P 15 063647 P 15 064095 P 15 064457 P 15
064638 P 15 064645 P 16 064666 P 16 069892 P 18
074185 P 18 076467 P 18 076509 P 19 076525 P 19
077252 P 19 077662 P 19 077983 P 20 077993 P 20
078594 P 20 084741 P 21 084798 P 21 084823 P 21
084884 P 21 085939 P 22 086176 P 22 097789 P 22
CONCENTRATION
047229 P 11 066691 P 17
CONSUMER PRODUCT
036066 P 7
CONTAINMENT FILTERING SYSTEM
014861 P 2
CONTAINMENT INTEGRITY
080114 P 20
CONTAMINATION
017116 P 4 018386 P 5 028573 P 7 029142 P 7
041148 P 9 041645 P 10 044648 P 11 048251 P 12
048268 P 12 060110 P 14 063198 P 14 063647 P 15
064645 P 16 072428 P 18
COOLANT CHEMISTRY
016404 P 4 020722 P 5
COOLANT PURIFICATION SYSTEM
100916 P 23
COOPER (BWR)
099674 P 23
CRITICAL NUCLIDE PATHWAY
066691 P 17
CRUD
020722 P 5
CYLINDER GAS
028573 P 7
DAMAGE
076230 P 18
DECONTAMINATION
060110 P 14
DIFFUSION
028573 P 7
DILUTION
017511 P 4 030279 P 7
DISTRIBUTION
049549 P 13 067194 P 17
DOSE
047229 P 11
DOSE CALCULATION, INTERNAL
067194 P 17
EFFLUENT
015010 P 3 015085 P 3 015311 P 3 020722 P 5
021658 P 6 021715 P 6 041359 P 9 085939 P 22
ENVIRONMENTAL PROTECTION AGENCY (EPA)
078991 P 20
EXCRETION, URINE
038079 P 8 049549 P 13 066691 P 17 067194 P 17
EXPLOSION
018385 P 5 048268 P 12
EXPONENTIAL FUNCTION
049549 P 13 067194 P 17
EXPOSURE, ACUTE
047229 P 11
EXPOSURE, CHRONIC
049549 P 13
EXPOSURE, SKIN
044648 P 11 047229 P 11 077983 P 20
FAILURE
041359 P 9 059951 P 14 068458 P 17 077983 P 20
078594 P 20 080114 P 20 097789 P 22 098560 P 22
099674 P 23 100916 P 23
FAILURE, ADMINISTRATIVE CONTROL
011788 P 2 013446 P 2 018386 P 5 020619 P 5
029142 P 7 032284 P 7 036066 P 7 037494 P 8
038078 P 8 040450 P 9 041148 P 9 041159 P 9
041365 P 10 041560 P 10 041562 P 10 041563 P 10
043005 P 11 048187 P 12 049915 P 13 055009 P 13
057036 P 13 063198 P 14 064095 P 15 064457 P 15
064666 P 16 068987 P 18 077252 P 19 077662 P 19
084798 P 21 084823 P 21 084884 P 21 086176 P 22
099674 P 23
FAILURE, CLADDING
060110 P 14
FAILURE, DESIGN ERROR
074185 P 18 076230 P 18
FAILURE, EQUIPMENT

007703 P 1 048268 P 12 074185 P 18 078456 P 20
097789 P 22
FAILURE, FUEL ELEMENT
060110 P 14
FAILURE, INSTRUMENT
038078 P 8
FAILURE, MAINTENANCE ERROR
008009 P 1 065550 P 16 080114 P 20
FAILURE, OPERATOR ERROR
010831 P 2 011788 P 2 016404 P 4 043005 P 11
044641 P 11 044648 P 11 048261 P 12 059951 P 14
061448 P 14 063637 P 15 064095 P 15 064666 P 16
064826 P 16 068987 P 18 077252 P 19 077993 P 20
084741 P 21 086176 P 22
FAILURE, PIPE
015010 P 3
FAILURE, SCRAM MECHANISM
020722 P 5
FAILURE, TUBING
020722 P 5 021715 P 6 027525 P 6 059951 P 14
064649 P 16 066846 P 17
FAT
049549 P 13
FISSION PRODUCT RELEASE
055009 P 13 060110 P 14 065550 P 16
FLOOD
076230 P 18
FT. ST. VRAIN (HTGR)
100916 P 23
FUEL BURNUP
016404 P 4
FUEL ELEMENTS
060110 P 14
FUEL REPROCESSING
063647 P 15
GAS
047229 P 11 049549 P 13
GLOVE BOX
030279 P 7 041148 P 9 078456 P 20
GROSS BETA
063647 P 15
HEAT EXCHANGERS
016404 P 4 021715 P 6 064649 P 16 066846 P 17
HEAVY WATER
066846 P 17
HEMATOLOGY
067194 P 17
HOT LABORATORY
041148 P 9 041359 P 9 041560 P 10 041563 P 10
044641 P 11 064457 P 15 064645 P 16
HYDROGEN
015996 P 3
IC GROSSLY NORMAL
067194 P 17
INCIDENT
017373 P 4 018385 P 5
INCIDENT, EQUIPMENT
015010 P 3 015085 P 3
INCIDENT, EXPOSURE
038079 P 8 044641 P 11 044648 P 11 047229 P 11
048261 P 12 049915 P 13
INCIDENT, HUMAN ERROR
016404 P 4 018386 P 5 044641 P 11 044648 P 11
064666 P 16
INCIDENT, NONREACTOR
037494 P 8 038078 P 8 038079 P 8 044641 P 11
044648 P 11 049915 P 13
INCIDENT, WINDSCALE
015289 P 3
INDUSTRIAL SAFETY
039821 P 9 040450 P 9 041560 P 10 041562 P 10
INDUSTRY, MANUFACTURING
067194 P 17
INGESTION
048261 P 12 059951 P 14 077983 P 20
INHALATION
020620 P 5 021715 P 6 043005 P 11 044641 P 11
048187 P 12 049549 P 13 049659 P 13 049915 P 13
059951 P 14 064095 P 15 068987 P 18 074185 P 18
076467 P 18 078456 P 20 087511 P 22 097789 P 22
INSTRUMENT, ABNORMAL INDICATION
065550 P 16
INSTRUMENT, INTERLOCK
020619 P 5
INSTRUMENT, LIQUID LEVEL
065550 P 16
IODINE
064457 P 15 065550 P 16 078991 P 20
KIDNEY
049549 P 13
KRYPTON
025349 P 6
LAKE MICHIGAN
072428 P 18
LEAK
027525 P 6 048251 P 12 059951 P 14 064649 P 16
066846 P 17 098560 P 22
LEGALISTICS
084884 P 21 085939 P 22
LICENSE STATUS
010640 P 1 036066 P 7 057036 P 13 077662 P 19
LIVER
049549 P 13
LRL
066691 P 17
LUMINARY
067194 P 17
LUNG
049549 P 13
MAIN COOLING SYSTEM
015996 P 3 027525 P 6 060110 P 14
MAINTENANCE AND REPAIR
007703 P 1 020722 P 5 027525 P 6 077983 P 20
MALE
067194 P 17
MAN
049549 P 13 049659 P 13 067194 P 17
MATURE
067194 P 17
MILITARY CONSIDERATION
086176 P 22
MILK
066691 P 17
MITR (RR)
064826 P 16
MODIFICATION
084741 P 21
MONITOR, AIR
041359 P 9
MONITOR, ENVIRONMENTAL
066691 P 17
MONITOR, GAS
041560 P 10 041562 P 10
MONITOR, LIQUID
061448 P 14
MONITOR, STACK
015085 P 3 055009 P 13
MONITORING PROGRAM, ENVIRONMENTAL
030279 P 7 098560 P 22
MONITORING SYSTEM, RADIATION
041148 P 9 041560 P 10
MONTH
049659 P 13 067194 P 17
MPC
017511 P 4 021718 P 6 048187 P 12 066691 P 17
MUSCLE
049549 P 13
NBS
064638 P 15 064649 P 16 066846 P 17
NFS
063647 P 15
NICKEL
025349 P 6
NOBLE GAS
078991 P 20
NS SAVANNAH (PWR)
014861 P 2
OFF GAS
015996 P 3 016404 P 4 099674 P 23
OPERATING EXPERIENCE
027525 P 6 061448 P 14
OPERATING EXPERIENCE SUMMARY
007703 P 1 015996 P 3
OXIDE
067194 P 17
PALISADES (PWR)
072428 P 18
PERSONNEL EXPOSURE, RADIATION
010376 P 1 013446 P 2 038078 P 8 038079 P 8
041563 P 10 043005 P 11 044641 P 11 044648 P 11
047157 P 11 047229 P 11 048187 P 12 048251 P 12
048261 P 12 048268 P 12 049549 P 13 049659 P 13
049915 P 13 059951 P 14 060110 P 14 063637 P 15
064095 P 15 064826 P 16 067194 P 17 068458 P 17
068987 P 18 074185 P 18 076467 P 18 076509 P 19
076525 P 19 077252 P 19 077983 P 20 078456 P 20
084741 P 21 087511 P 22 097789 P 22
PERSONNEL PROTECTIVE DEVICE
068458 P 17 077983 P 20
PHYSIOLOGY/METABOLISM
049549 P 13 049659 P 13
PM 3A (PWR)

007703 P 1
POINT BEACH 1 (PWR)
065550 P 16
POPULATION EXPOSURE
066691 P 17 084884 P 21
POWER PLANT, NUCLEAR
078991 P 20
PRESSURE, SUBATMOSPHERIC
048268 P 12
PROCEDURES AND MANUALS
064457 P 15 086176 P 22
PROMETHIUM
039425 P 8
RADIATION EFFECT
047229 P 11 067194 P 17
RADIATION EXPOSURE, RECORD KEEPING
048187 P 12
RADIATION MONITORS
014861 P 2 066691 P 17
RADIATION PROTECTION, ORGANIZATION
060110 P 14
RADIATION SAFETY AND CONTROL
008009 P 1 013446 P 2 016660 P 4 017511 P 4
032284 P 7 041562 P 10 041563 P 10 063198 P 14
064457 P 15
RADIOACTIVITY RELEASE
027525 P 6 029142 P 7 037494 P 8 041148 P 9
041359 P 9 063198 P 14 066691 P 17 076230 P 18
078991 P 20 080114 P 20 084798 P 21 098560 P 22
RADIOCHEMICAL PLANT SAFETY
041148 P 9 047157 P 11
RADIOCHEMICAL PROCESSING
041148 P 9 044641 P 11 048268 P 12 055009 P 13
059951 P 14 063637 P 15 063647 P 15 068458 P 17
068987 P 18 074185 P 18 076230 P 18 077983 P 20
085939 P 22
RADIOGRAPHY
032284 P 7
RADIOISOTOPE
017116 P 4 017373 P 4 018385 P 5 018386 P 5
025349 P 6 039821 P 9
RADIOLOGY
044648 P 11 048187 P 12 048261 P 12 048268 P 12
049915 P 13 077993 P 20 084741 P 21
RADIONUCLIDE UPTAKE
049549 P 13 049659 P 13
RADIOPHARMACEUTICAL
044648 P 11 077993 P 20 057789 P 22
RADIUM
025349 P 6 028573 P 7 029142 P 7
RADON
025349 P 6 028573 P 7
REACTOR COOLANT
098560 P 22
REACTOR SAFETY SYSTEM
049659 P 13
REACTOR STARTUP EXPERIENCE
100916 P 23
REACTOR, BWR
099674 P 23
REACTOR, HTGR
100916 P 23
REACTOR, HWR
015010 P 3 017511 P 4 021715 P 6 066846 P 17
REACTOR, MARITIME
014861 P 2
REACTOR, MILITARY
007703 P 1
REACTOR, POWER
015996 P 3
REACTOR, PWR
007703 P 1 014861 P 2 015996 P 3 016404 P 4
020722 P 5 027525 P 6 061448 P 14 065550 P 16
080114 P 20 098560 P 22
REACTOR, RESEARCH
010831 P 2 015010 P 3 017511 P 4 060110 P 14
064649 P 16 064826 P 16 066846 P 17
RECORDS
064457 P 15
REFUELING
007703 P 1
REGULATION, AEC
039821 P 9 041159 P 9 078991 P 20
REGULATION, STATE
063647 P 15
RELEASE RATE
085939 P 22
REPORT, ENVIRONMENTAL
078991 P 20
REPORT, NRC INSPECTION
084798 P 21 084823 P 21
REPORT, OPERATIONS
015996 P 3 020722 P 5 027525 P 6
REPORT, OPERATIONS SUMMARY
016404 P 4
RETENTION
049659 P 13
RETENTION FUNCTION
049659 P 13 067194 P 17
RIVER
098560 P 22
ROBINSON 2 (PWR)
061448 P 14
SAFETY EVALUATION
014861 P 2
SAMPLING
066691 P 17 085939 P 22 098560 P 22 099674 P 23
SCRUBBER
021658 P 6
SHEARON HARRIS 2 (PWR)
078991 P 20
SHEARON HARRIS 3 (PWR)
078991 P 20
SHEARON HARRIS 4 (PWR)
078991 P 20
SHIELDING
032284 P 7
SHIPPING CONTAINER
017373 P 4 059951 P 14
SHUTDOWN COOLING SYSTEM
065550 P 16
SKIN
067194 P 17
SOLID
044641 P 11
SORPTION
021718 P 6
SOURCE, CONTINUOUS
029142 P 7
SOURCE, MULTIPLE
029142 P 7
SOURCE, RADIATION
008009 P 1 041365 P 10 048251 P 12 048261 P 12
069892 P 18
SOURCE, RADIATION, LOST
010408 P 1 011788 P 2 038745 P 8 064638 P 15
064666 P 16 077993 P 20 078594 P 20
SPECIAL NUCLEAR MATERIAL
039821 P 9
SPLEEN
049549 P 13
STACK
015085 P 3 015311 P 3 016661 P 4 021658 P 6
021718 P 6 028573 P 7 030279 P 7 037494 P 8
099674 P 23
STEAM GENERATOR
016404 P 4 020722 P 5 027525 P 6
STORAGE CONTAINER
018385 P 5 072428 P 18 074185 P 18 076230 P 18
STRESS RUPTURE
060110 P 14
STRONTIUM
063647 P 15
SURFACE CONTAMINATION
037494 P 8
SURFACE, PAINTED
030279 P 7
SURVEILLANCE PROGRAM
020619 P 5 020620 P 5
SURVEY
041359 P 9
SURVEY, RADIATION
011949 P 2 055009 P 13
SWITZERLAND
060110 P 14
SYSTEM OPERABILITY IN ACCIDENT
100916 P 23
TECHNICAL SPECIFICATIONS
014861 P 2
TEST INTERVAL
069892 P 18 099674 P 23
TEST, DOP FILTER
014861 P 2
TEST, LEAK
069892 P 18
TEST, LEAK RATE
015996 P 3
THREE MILE ISLAND 1 (PWR)
098560 P 22
TOXICITY
049549 P 13
TRACER

015996 P 3
TRANSPORTATION AND HANDLING
017373 P 4 032284 P 7 064638 P 15 077662 P 19
077993 P 20 078594 P 20
VEGETATION
066691 P 17
VENTILATION SYSTEM
018386 P 5 030279 P 7 038078 P 8 038079 P 8
049915 P 13
WASTE DISPOSAL
014861 P 2 027525 P 6 077252 P 19 086176 P 22
WASTE DISPOSAL, ATMOSPHERIC
037494 P 8
WASTE DISPOSAL, GAS
037494 P 8
WASTE DISPOSAL, LIQUID
010831 P 2 011949 P 2 017511 P 4 061448 P 14
065550 P 16 072428 P 18
WASTE DISPOSAL, RIVER
015010 P 3 017511 P 4
WASTE STORAGE
020620 P 5 076230 P 18
WASTE TREATMENT, EQUIPMENT
076230 P 18
WASTE, SEWAGE
063647 P 15
WATER
049549 P 13 066691 P 17
WATER QUALITY
078991 P 20
WEATHER, SEVERE
076230 P 18
WHOLE BODY
047229 P 11 049659 P 13
YANKEE ROWE (PWR)
015996 P 3 016404 P 4 020722 P 5 027525 P 6
080114 P 20
YEAR
049549 P 13

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

BAINBRIDGE AE
015289 P 3
BECKETT EF
007703 P 1
BRANDT FC
060110 P 14
BURTSAVAGE EM
015311 P 3 021718 P 6
CASTO WR
041645 P 10
DAWSON KB
047229 P 11 067194 P 17
EHHALT DH
015289 P 3
FAIRMAN W
049659 P 13
FLURY H
060110 P 14
FRICK U
060110 P 14
GUDIKSEN PH
066691 P 17
JOHNSON RM
011788 P 2
KILLIAN CB
013446 P 2
LAMBERT BE
047229 P 11 067194 P 17
LOW LD
028573 P 7
MINDER W
049549 P 13
MYERS DS
066691 P 17
ROBINSON J
049659 P 13
SEDLET J
049659 P 13
SHARP BA
047229 P 11
SHARPE HBA
067194 P 17
SOERNSON RC
025349 P 6
SUTER F
060110 P 14
TINNEY JF
066691 P 17
YODER RE
066691 P 17

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN THE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE. * INDICATES END OF TITLE.)

#RESPONSE TO AEC LETTER	ABOUT APPARENT NONCOMPLIANCE (WARNER-LAMBERT RES. INST.)*	077252 P 19
#	ACCIDENT ANALYSIS - RUPTURE OF SIRW TANK (PALISADES POINT)*	072428 P 18
THE TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN FOLLOWING THE	ACCIDENT AT WINDSCALE* #A PEAK IN	015289 P 3
#JOHNS HOPKINS U TRITIUM	ACCIDENT*	018386 P 5
#	ACCIDENTAL INTAKE OF TRITIATED WATER (HPIS/63)*	067194 P 17
#AN	ACCIDENTAL INTAKE OF TRITIATED WATER*	047229 P 11
#ENVIRONMENTAL SAMPLING PROGRAM FOLLOWING AN	ACCIDENTAL TRITIUM RELEASE*	066691 P 17
#CORRECTIVE	ACTION TO VIOLATIONS OF AEC REQUIREMENTS*	084823 P 21
#CORRECTIVE	ACTION TO VIOLATIONS OF AEC REQUIREMENTS*	084798 P 21
#AEC ASKED TO REVIEW CORRECTIVE	ACTIONS PROPOSED BY DIAL-PAINTING FACILITY*	010376 P 1
#PERSONNEL EXPOSURE TO AIRBORNE	ACTIVITY*	064095 P 15
#CONTAMINATION IN UNRESTRICTED AREA AND TRITIUM	ACTIVITY*	063198 P 14
#N S SAVANNAH CHANGE 5 - MISC.	ADMINISTRATION AND TESTING*	014861 P 2
PAINTING FACILITY* #	AEC ASKED TO REVIEW CORRECTIVE ACTIONS PROPOSED BY DIAL-	010376 P 1
RADIATION SAFETY PROGRAM* #	AEC INSPECTION CALLS FOR RE-EVALUATION OF COMPANY	048187 P 12
RES. INST.)* #RESPONSE TO	AEC LETTER ABOUT APPARENT NONCOMPLIANCE (WARNER-LAMBERT	077252 P 19
#RESPONSE TO	AEC NONCOMPLIANCE CITATION*	055009 P 13
#CORRECTIVE ACTION TO VIOLATIONS OF	AEC REQUIREMENTS*	084798 P 21
#CORRECTIVE ACTION TO VIOLATIONS OF	AEC REQUIREMENTS*	084823 P 21
#EMPLOYEE WORKED IN HIGH	AIR CONCENTRATION OF TRITIUM (4 TIMES THE MPC FOR AIR)*	076467 P 18
#DISAPPEARANCE OF RADIOACTIVE MATERIAL FROM KELLY	AIR FORCE BASE*	010408 P 1
#LOSS OF EMERGENCY EXIT SIGN CONTAINING TRITIUM BY THE	AIR FORCE*	086176 P 22
#LOSS OF COMPASSES CONTAINING TRITIUM BY THE	AIR FORCE*	064666 P 16
IN HIGH AIR CONCENTRATION OF TRITIUM (4 TIMES THE MPC FOR	AIR)* #EMPLOYEE WORKED	076467 P 18
#PERSONNEL EXPOSURE TO	AIRBORNE ACTIVITY*	064095 P 15
#TWO OVEREXPOSURES REPORTED (	AIRBORNE EFFLUENT, TRITIUM)*	047157 P 11
#EMPLOYEES INHALE	AIRBORNE RADIOACTIVE MATERIAL (TRITIUM)*	038079 P 8
#ELECTRONS CO.	ALLOWED TOO MUCH TIME BETWEEN LEAK TESTS*	069892 P 18
#ACCIDENT	ANALYSIS - RUPTURE OF SIRW TANK (PALISADES POINT)*	072428 P 18
#VIOLATION OF CONTAINMENT AT YANKEE ROWE (	AO 73-1)*	080114 P 20
#RESPONSE TO AEC LETTER ABOUT	APPARENT NONCOMPLIANCE (WARNER-LAMBERT RES. INST.)*	077252 P 19
#CONTAMINATION IN UNRESTRICTED	AREA AND TRITIUM ACTIVITY*	063198 P 14
TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF WORKERS AND WORK	AREA* #LEAKY VIAL OF	048251 P 12
#A COBALT AND A TRITIUM INCIDENT AT	ARGONNE NATIONAL LABORATORY*	049659 P 13
PAINTING FACILITY* #AEC	ASKED TO REVIEW CORRECTIVE ACTIONS PROPOSED BY DIAL-	010376 P 1
#A PEAK IN THE TRITIUM CONTENT OF	ATMOSPHERIC HYDROGEN FOLLOWING THE ACCIDENT AT WINDSCALE*	015289 P 3
#REFUELING AND REPAIRS OF THE PM-3A DURING THE 1964-65	AUSTRAL SUMMER*	007703 P 1
#DISAPPEARANCE OF RADIOACTIVE MATERIAL FROM KELLY AIR FORCE	BASE*	010408 P 1
#UNSCHEDULED RELEASE OF RADIOACTIVE WASTE AT POINT	BEACH*	065550 P 16
#SEWAGE WATER CONTAMINATED AT NUCLEAR FUELS SERVICES, INC. (	BETA, STRONTIUM, TRITIUM)*	063647 P 15
#ELECTRONS CO. ALLOWED TOO MUCH TIME	BETWEEN LEAK TESTS*	069892 P 18
#MATTHEY	BISHOP POSSESSED TRITIUM WITHOUT LICENSE*	057036 P 13
#LEAK IN PRIMARY HEAT EXCHANGER, NATL.	BUR. STANDARDS RESEARCH REACTOR*	064649 P 16
OF TRITIATED WATER* #NATL.	BUREAU OF STANDARDS REPORTS LOSS OF TWO STANDARD SAMPLES	064638 P 15
#NONCOMPLIANCE WITH	BYPRODUCT MATERIAL LICENSE*	041563 P 10
#NONCOMPLIANCE WITH	BYPRODUCT MATERIAL LICENSE*	041148 P 9
#NONCOMPLIANCE WITH	BYPRODUCT MATERIAL LICENSE*	041560 P 10
#NONCOMPLIANCE WITH	BYPRODUCT MATERIAL LICENSE*	041359 P 9
* #AEC INSPECTION	CALLS FOR RE-EVALUATION OF COMPANY RADIATION SAFETY PROGRAM	048187 P 12
EXPLOSION ENDANGERING ISOTOPES* #	CASE INSTITUTE OF TECHNOLOGY REPORTS REFRIGERATOR	018385 P 5
#LEAKY VIAL OF TRITIUM GAS	CAUSES SLIGHT CONTAMINATION OF WORKERS AND WORK AREA*	048251 P 12
#NONCOMPLIANCE OF LICENSE BY NON-	CERTIFICATION OF SPECIFICATIONS DESCRIBED IN LICENSE*	039429 P 8
#N S SAVANNAH	CHANGE 5 - MISC. ADMINISTRATION AND TESTING*	014861 P 2
#	CHEMIST EXPOSED TO TRITIATED WATER*	076509 P 19
HR PERIOD* #	CHEMIST HAS UPTAKE OF 767 MICROCURIES OF TRITIUM OVER A 49-	063637 P 15
#	CHEMIST RECEIVES INTERNAL EXPOSURE FROM TRITIUM*	068458 P 17
#	CITATION CORRESPONDENCE*	029142 P 7
TRITIUM* #NONCOMPLIANCE	CITATION FOR UNAUTHORIZED TRANSFER AND POSSESSION OF	036066 P 7
#T. R. SCHWALM REPLIES TO COMPLIANCE	CITATION OF MAY 11, 1967*	017116 P 4
#NON COMPLIANCE	CITATION OF US RADIUM*	025349 P 6
#NONCOMPLIANCE	CITATION*	028573 P 7
#RESPONSE TO AEC NONCOMPLIANCE	CITATION*	055009 P 13
#KAMAN NUCLEAR DIV.	CITED FOR NON-COMPLIANCE FEBRUARY 28, 1967*	020619 P 5
#TRACERLAB	CITED FOR NON-COMPLIANCE MARCH 7, 1967*	020620 P 5
#T. R. SCHWALM	CITED FOR NON-COMPLIANCE*	016660 P 4
#T.R. SCHWALM OF LANCASTER, PA.	CITED FOR NONCOMPLIANCE WITH LICENSE AND 10CFR20 (TRITIUM)*	037494 P 8
#NEW ENGLAND NUCLEAR CORPORATION	CITED FOR NONCOMPLIANCE, AUGUST 8, 1966*	011949 P 2
#DIVISION OF COMPLIANCE	CITES COMPANY FOR UNAUTHORIZED POSSESSION OF TRITIUM*	010640 P 1
#	CIVIL PENALITIES IMPOSED ON THEODORE R. SCHWALM, INC.*	084884 P 21
EXCESSIVE TRITIUM RELEASES* #	CIVIL PENALTY IMPOSED ON THEODORE R. SCHWALM, INC., FOR	085939 P 22

#ELECTRONS CO. ALLOWED TOO MUCH TIME BETWEEN LEAK TESTS* 069892 P 18
LABORATORY* #A COBALT AND A TRITIUM INCIDENT AT ARGONNE NATIONAL 049659 P 13
#DIVISION OF COMPLIANCE CITES COMPANY FOR UNAUTHORIZED POSSESSION OF TRITIUM* 010640 P 1
#AEC INSPECTION CALLS FOR RE-EVALUATION OF COMPANY RADIATION SAFETY PROGRAM* 048187 P 12
#IMPORTATION OF COMPASSES CONTAINING TRITIUM BY SILVA* 077662 P 19
#LOSS OF COMPASSES CONTAINING TRITIUM BY THE AIR FORCE* 064666 P 16
#T. R. SCHWALM REPLIES TO COMPLIANCE CITATION OF MAY 11, 1967* 017116 P 4
#NON COMPLIANCE CITATION OF US RADIUM* 025349 P 6
TRITIUM* #DIVISION OF COMPLIANCE CITES COMPANY FOR UNAUTHORIZED POSSESSION OF 010640 P 1
#KAMAN NUCLEAR DIV. CITED FOR NON- COMPLIANCE FEBRUARY 28, 1967* 020619 P 5
#TRACERLAB CITED FOR NON- COMPLIANCE MARCH 7, 1967* 020620 P 5
#T. R. SCHWALM CITED FOR NON- COMPLIANCE* 016660 P 4
#EMPLOYEE WORKED IN HIGH AIR CONCENTRATION OF TRITIUM (4 TIMES THE MPC FOR AIR)* 076467 P 18
#POWER REACTOR REGULATION -- HARRIS PLANT, EPA CONCERNS* 078991 P 20
#IMPORTATION OF COMPASSES CONTAINING TRITIUM BY SILVA* 077662 P 19
#LOSS OF EMERGENCY EXIT SIGN CONTAINING TRITIUM BY THE AIR FORCE* 086176 P 22
#LOSS OF COMPASSES CONTAINING TRITIUM BY THE AIR FORCE* 064666 P 16
RADIOPHARMACEUTICAL LAB.* #FLASK CONTAINING 2.25 CURIES OF TRITIUM IMPLODES AT 048268 P 12
#VIOLATION OF CONTAINMENT AT YANKEE ROWE (AO 73-1)* 080114 P 20
STRONTIUM, TRITIUM)* #SEWAGE WATER CONTAMINATED AT NUCLEAR FUELS SERVICES, INC. (BETA, 063647 P 15
#PENNSYLVANIA STATE UNIVERSITY RECEIVES TRITIUM CONTAMINATED PACKAGE* 017373 P 4
#TITANIUM TRITIDE CONTAMINATES TABLE TOP* 064645 P 16
CONTAMINATION AT TRITIUM PAINTING ESTABLISHMENT* 041645 P 10
CONTAMINATION IN UNRESTRICTED AREA AND TRITIUM ACTIVITY* 063198 P 14
CONTAMINATION OF TWO PERSONS WITH TRITIUM* 044648 P 11
#LEAKY VIAL OF TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF WORKERS AND WORK AREA* 048251 P 12
WINDSCALE* #A PEAK IN THE TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN FOLLOWING THE ACCIDENT AT 015289 P 3
CONTROL OF RADIATION SAFETY* 041562 P 10
#TRITIUM LEVEL IN RIVER SAMPLE EXCEEDS CONTROL VALVE AT THREE MILE ISLAND 1* 098560 P 22
#INADEQUATE RADIATION CONTROL, TR SCHWALM, INC., LANCASTER, PA.* 008009 P 1
#QUARTERLY SAMPLE FOR TRITIUM NOT TAKEN ON TIME AT COOPER* 099674 P 23
#US RADIUM CORP REPORTS EXCESSIVE TRITIUM RELEASES SEPT 27/28, 1967* 021658 P 6
REPAIRING EQUIPMENT* #MAN AT U.S. RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT WHILE 043005 P 11
#US RADIUM CORP. LISTS 87 TRITIUM RELEASES JULY - DECEMBER 1966* 015311 P 3
#U.S. RADIUM CORP. REPORTS 6 EXCESSIVE STACK DISCHARGES* 021718 P 6
#EXPOSURE TO TRITIUM AT UNITED STATES RADIUM CORP.* 074185 P 18
#FLOOD DAMAGE AT U.S. RADIUM CORP.* 076230 P 18
#NEW ENGLAND NUCLEAR CORPORATION CITED FOR NONCOMPLIANCE, AUGUST 8, 1966* 011949 P 2
#U. S. RADIUM CORPORATION EMPLOYEE RECEIVES OVERDOSE OF TRITIUM* 038078 P 9
#U.S. RADIUM CORPORATION REPORTS EXCESSIVE STACK DISCHARGE OF TRITIUM* 016661 P 4
#U.S. RADIUM CORPORATION TRITIUM LEAK AND STACK-DISCHARGE* 015085 P 3
#TWO TRITIUM EXPOSURE INCIDENTS AT NEW ENGLAND NUCLEAR CORPORATION* 077983 P 20
#TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966* 013446 P 2
CORRECTIVE ACTION TO VIOLATIONS OF AEC REQUIREMENTS* 084823 P 21
CORRECTIVE ACTION TO VIOLATIONS OF AEC REQUIREMENTS* 084798 P 21
#AEC ASKED TO REVIEW CORRECTIVE ACTIONS PROPOSED BY DIAL-PAINTING FACILITY* 010376 P 1
CORRESPONDENCE ON TRITIUM PAINTING* 030279 P 7
#CITATION CORRESPONDENCE* 029142 P 7
#FLASK CONTAINING 2.25 CURIES OF TRITIUM IMPLODES AT RADIOPHARMACEUTICAL LAB.* 048268 P 12

#FLOOD DAMAGE AT U.S. RADIUM CORP.* 076230 P 18
#DEFECTIVE FUEL ELEMENTS AND DECONTAMINATION OF THE REACTOR DIORIT (PART I(* 060110 P 14
DIORIT (PART I(* # DEFECTIVE FUEL ELEMENTS AND DECONTAMINATION OF THE REACTOR 060110 P 14
OF LICENSE BY NON-CERTIFICATION OF SPECIFICATIONS DESCRIBED IN LICENSE* #NONCOMPLIANCE 039429 P 9
#AEC ASKED TO REVIEW CORRECTIVE ACTIONS PROPOSED BY DIAL-PAINTING FACILITY* 010376 P 1
#DEFECTIVE FUEL ELEMENTS AND DECONTAMINATION OF THE REACTOR DIORIT (PART I(* 060110 P 14
BASE* # DISAPPEARANCE OF RADIOACTIVE MATERIAL FROM KELLY AIR FORCE 010408 P 1
#MIT GRANTED EXEMPTION FROM 10CFR 20 PROVISIONS RELATING TO DISCHARGE OF TRITIUM TO SEWER* 017511 P 4
#U.S. RADIUM CORPORATION REPORTS EXCESSIVE STACK DISCHARGE OF TRITIUM* 016661 P 4
#U.S. RADIUM CORPORATION TRITIUM LEAK AND STACK- DISCHARGE* 015085 P 3
#U.S. RADIUM CORP. REPORTS 6 EXCESSIVE STACK DISCHARGES* 021718 P 6
#KAMAN NUCLEAR DIV. CITED FOR NON-COMPLIANCE FEBRUARY 28, 1967* 020619 P 5
POSSESSION OF TRITIUM* # DIVISION OF COMPLIANCE CITES COMPANY FOR UNAUTHORIZED 010640 P 1
#TRITIUM RELEASE FROM MIT REACTOR DUE TO HEAT EXCHANGER LEAK* 021715 P 6
#TRACE LIQUID RADIOACTIVE WASTE (TRITIUM) TO DUMP* 010831 P 2
#PROBABLE LOSS OF TRITIUM DURING SHIPMENT* 078594 P 20
#REFUELING AND REPAIRS OF THE PM-3A DURING THE 1964-65 AUSTRAL SUMMER* 007703 P 1

#TWO OVEREXPOSURES REPORTED (AIRBORNE EFFLUENT, TRITIUM)* 047157 P 11
ELECTRONS CO. ALLOWED TOO MUCH TIME BETWEEN LEAK TESTS* 069892 P 18
* #DEFECTIVE FUEL ELEMENTS AND DECONTAMINATION OF THE REACTOR DIORIT (PART I(060110 P 14
#LOSS OF EMERGENCY EXIT SIGN CONTAINING TRITIUM BY THE AIR FORCE* 086176 P 22
#U. S. RADIUM CORPORATION EMPLOYEE RECEIVES OVERDOSE OF TRITIUM* 038078 P 9
#EXPOSURE OF EMPLOYEE TO TRITIUM AT HOFFMANN-LA ROCHE* 097789 P 22
#EXPOSURE OF AN EMPLOYEE TO TRITIUM* 044641 P 11
TIMES THE MPC FOR AIR)* # EMPLOYEE WORKED IN HIGH AIR CONCENTRATION OF TRITIUM (4 076467 P 18
EMPLOYEES INHALE AIRBORNE RADIOACTIVE MATERIAL (TRITIUM)* 038079 P 8
CASE INSTITUTE OF TECHNOLOGY REPORTS REFRIGERATOR EXPLOSION ENDANGERING ISOTOPES* # 018385 P 5
AUGUST 8, 1966* #NEW ENGLAND NUCLEAR CORPORATION CITED FOR NONCOMPLIANCE, 011949 P 2
#TWO TRITIUM EXPOSURE INCIDENTS AT NEW ENGLAND NUCLEAR CORPORATION* 077983 P 20
#TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966* 013446 P 2
WERE OVEREXPOSED* #NEW ENGLAND NUCLEAR REPORTS THREE INCIDENTS IN WHICH WORKERS 059951 P 14

#TECHNICIAN EXPOSED TO TRITIUM AT NEW ENGLAND NUCLEAR* 084741 P 21
TRITIUM RELEASE* # ENVIRONMENTAL SAMPLING PROGRAM FOLLOWING AN ACCIDENTAL 066691 P 17
#POWER REACTOR REGULATION -- HARRIS PLANT, EPA CONCERNS* 078991 P 20
INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT WHILE REPAIRING EQUIPMENT* #MAN AT U.S. RADIUM CORP. 043005 P 11
#CONTAMINATION AT TRITIUM PAINTING ESTABLISHMENT* 041645 P 10
#AEC INSPECTION CALLS FOR RE- EVALUATION OF COMPANY RADIATION SAFETY PROGRAM* 048187 P 12
#TRITIUM LEVEL IN RIVER SAMPLE EXCEEDS CONTROL VALVE AT THREE MILE ISLAND 1* 098560 P 22
#U.S. RADIUM CORPORATION REPORTS EXCESSIVE STACK DISCHARGE OF TRITIUM* 016661 P 4
#U.S. RADIUM CORP. REPORTS 6 EXCESSIVE STACK DISCHARGES* 021718 P 6
#US RADIUM CORP REPORTS EXCESSIVE TRITIUM RELEASES SEPT 27/28, 1967* 021658 P 6
#CIVIL PENALTY IMPOSED ON THEODORE R. SCHWALM, INC., FOR EXCESSIVE TRITIUM RELEASES* 085939 P 22
#TRITIUM RELEASE FROM MIT REACTOR DUE TO HEAT EXCHANGER LEAK* 021715 P 6
#MIT REACTOR HEAT EXCHANGER LEAK, FEBRUARY 21-23, 1967* 015010 P 3
#HEAT EXCHANGER TUBE LEAK AT NBS* 066846 P 17
#LEAK IN PRIMARY HEAT EXCHANGER, NATL. BUR. STANDARDS RESEARCH REACTOR* 064649 P 16
OF TRITIUM TO SEWER* #MIT GRANTED EXEMPTION FROM 10CFR 20 PROVISIONS RELATING TO DISCHARGE 017511 P 4
#LOSS OF EMERGENCY EXIT SIGN CONTAINING TRITIUM BY THE AIR FORCE* 086176 P 22
#SELECTED YANKEE OPERATING EXPERIENCE.* 016404 P 4
#CASE INSTITUTE OF TECHNOLOGY REPORTS REFRIGERATOR EXPLOSION ENDANGERING ISOTOPES* 018385 P 5
#CHEMIST EXPOSED TO TRITIATED WATER* 076509 P 19
#TECHNICIAN EXPOSED TO TRITIUM AT NEW ENGLAND NUCLEAR* 084741 P 21
#CHEMIST RECEIVES INTERNAL EXPOSURE FROM TRITIUM* 068458 P 17
#TWO TRITIUM EXPOSURE INCIDENTS AT NEW ENGLAND NUCLEAR CORPORATION* 077983 P 20
#MAN AT U.S. RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT WHILE REPAIRING EQUIPMENT* 043005 P 11
EXPOSURE OF AN EMPLOYEE TO TRITIUM* 044641 P 11
EXPOSURE OF EMPLOYEE TO TRITIUM AT HOFFMANN-LA ROCHE* 097789 P 22
EXPOSURE OF TWO TECHNICIANS TO TRITIUM* 048261 P 12
#PERSONNEL EXPOSURE TO AIRBORNE ACTIVITY* 064095 P 15
EXPOSURE TO TRITIUM AT UNITED STATES RADIUM CORP.* 074185 P 18
#PERSONNEL EXPOSURE TO TRITIUM* 049915 P 13
#REPORT OF PERSONNEL EXPOSURE* 068987 P 18
#REPORT OF PERSONNEL EXPOSURE* 087511 P 22
#TECHNICIAN RECEIVES INTERNAL TRITIUM EXPOSURE* 078456 P 20
#TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966* 013446 P 2

TO REVIEW CORRECTIVE ACTIONS PROPOSED BY DIAL-PAINTING FACILITY* #AEC ASKED 010376 P 1
#QUANTITY OF TRITIUM IMPORTED FOR FISCAL YEAR 1968* 040450 P 9
RADIOPHARMACEUTICAL LAB.* # FLASK CONTAINING 2.25 CURIES OF TRITIUM IMPLODES AT 048268 P 12
FLOOD DAMAGE AT U.S. RADIUM CORP.* 076230 P 18
#ENVIRONMENTAL SAMPLING PROGRAM FOLLOWING AN ACCIDENTAL TRITIUM RELEASE* 066691 P 17
#A PEAK IN THE TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN FOLLOWING THE ACCIDENT AT WINDSCALE* 015289 P 3
#DISAPPEARANCE OF RADIOACTIVE MATERIAL FROM KELLY AIR FORCE BASE* 010408 P 1
#LOSS OF COMPASSES CONTAINING TRITIUM BY THE AIR FORCE* 064666 P 16
#LOSS OF EMERGENCY EXIT SIGN CONTAINING TRITIUM BY THE AIR FORCE* 086176 P 22
24, 1971* # FOUR OVEREXPOSED TO TRITIUM AT MIT RESEARCH REACTOR, MAY 064826 P 16
#TRITIUM LEAKING FROM PENETRATION AT FT. ST. VRAIN* 100916 P 23
PART II* #DEFECTIVE FUEL ELEMENTS AND DECONTAMINATION OF THE REACTOR DIORIT (060110 P 14
#SEWAGE WATER CONTAMINATED AT NUCLEAR FUELS SERVICES, INC. (BETA, STRONTIUM, TRITIUM)* 063647 P 15

#LEAKY VIAL OF TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF WORKERS AND WORK AREA* 048251 P 12
#YANKEE STEAM GENERATOR TUBE REPAIRS* 020722 P
DISCHARGE OF TRITIUM TO SEWER* #MIT GRANTED EXEMPTION FROM 10CFR 20 PROVISIONS RELATING TO 017511 P

#POWER REACTOR REGULATION -- HARRIS PLANT, EPA CONCERNS* 078991 P 20
PERIOD* #CHEMIST HAS UPTAKE OF 767 MICROCURIES OF TRITIUM OVER A 49-HR 063637 P 15
#TRITIUM RELEASE FROM MIT REACTOR DUE TO HEAT EXCHANGER LEAK* 021715 P 6
#MIT REACTOR HEAT EXCHANGER LEAK, FEBRUARY 21-23, 1967* 015010 P 3
HEAT EXCHANGER TUBE LEAK AT NBS* 066846 P 17
#LEAK IN PRIMARY HEAT EXCHANGER, NATL. BUR. STANDARDS RESEARCH REACTOR* 064649 P 16
* #EMPLOYEE WORKED IN HIGH AIR CONCENTRATION OF TRITIUM (4 TIMES THE MPC FOR AIR) 076467 P 18
#EXPOSURE OF EMPLOYEE TO TRITIUM AT HOFFMANN-LA ROCHE* 097789 P 22
#JOHNS HOPKINS U TRITIUM ACCIDENT* 018386 P 5
#ACCIDENTAL INTAKE OF TRITIATED WATER (HPIS/63)* 067194 P 17
#CHEMIST HAS UPTAKE OF 767 MICROCURIES OF TRITIUM OVER A 49- HR PERIOD* 063637 P 15
#A PEAK IN THE TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN FOLLOWING THE ACCIDENT AT WINDSCALE* 015289 P 3

ELEMENTS AND DECONTAMINATION OF THE REACTOR DIORIT (PART II* #DEFECTIVE FUEL 060110 P 14
#NONCOMPLIANCE WITH RADIATION SAFETY STANDARDS AT U OF ILLINOIS* 064457 P 15
#FLASK CONTAINING 2.25 CURIES OF TRITIUM IMPLODES AT RADIOPHARMACEUTICAL LAB.* 048268 P 12
IMPORTATION OF COMPASSES CONTAINING TRITIUM BY SILVA* 077662 P 19
#QUANTITY OF TRITIUM IMPORTED FOR FISCAL YEAR 1968* 040450 P 9
#TRITIUM IMPORTED INTO UNITED STATES FOR USE IN TIMEPIECES* 039821 P 9
#CIVIL PENALITIES IMPOSED ON THEODORE R. SCHWALM, INC.* 084884 P 21
TRITIUM RELEASES* #CIVIL PENALTY IMPOSED ON THEODORE R. SCHWALM, INC., FOR EXCESSIVE 085939 P 22
PA.* # INADEQUATE RADIATION CONTROL, TR SCHWALM, INC., LANCASTER, 008009 P 1
#SEWAGE WATER CONTAMINATED AT NUCLEAR FUELS SERVICES, INC. (BETA, STRONTIUM, TRITIUM)* 063647 P 15

#CIVIL PENALITIES IMPOSED ON THEODORE R. SCHWALM, INC.* 084884 P 21
#CIVIL PENALTY IMPOSED ON THEODORE R. SCHWALM, INC., FOR EXCESSIVE TRITIUM RELEASES* 085939 P 27
#INADEQUATE RADIATION CONTROL, TR SCHWALM, INC., LANCASTER, PA.* 008009 P 1
#A COBALT AND A TRITIUM INCIDENT AT ARGONNE NATIONAL LABORATORY* 049659 P 13
#TWO TRITIUM EXPOSURE INCIDENTS AT NEW ENGLAND NUCLEAR CORPORATION* 077983 P 20
#NEW ENGLAND NUCLEAR REPORTS THREE INCIDENTS IN WHICH WORKERS WERE OVEREXPOSED* 059951 P 14
#EMPLOYEES INHALE AIRBORNE RADIOACTIVE MATERIAL (TRITIUM)* 038079 P 8
EQUIPMENT* #MAN AT U.S. RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT WHILE REPAIRING 043005 P 11
SAFETY PROGRAM* #AEC INSPECTION CALLS FOR RE-EVALUATION OF COMPANY RADIATION 048187 P 12
LETTER ABOUT APPARENT NONCOMPLIANCE (WARNER-LAMBERT RES. INST.)* #RESPONSE TO AEC 077252 P 19
ENDANGERING ISOTOPES* #CASE INSTITUTE OF TECHNOLOGY REPORTS REFRIGERATOR EXPLOSION 018385 P 5
#ACCIDENTAL INTAKE OF TRITIATED WATER (HPIS/63)* 067194 P 17
#AN ACCIDENTAL INTAKE OF TRITIATED WATER* 047229 P 11
#SELECTED TOPICS OF INTEREST* 027525 P 6
#CHEMIST RECEIVES INTERNAL EXPOSURE FROM TRITIUM* 068458 P 17
#TECHNICIAN RECEIVES INTERNAL TRITIUM EXPOSURE* 078456 P 20
INTERNE KONTAMINATION MIT TRITIUM* 049549 P 13
#TRITIUM IMPORTED INTO UNITED STATES FOR USE IN TIMEPIECES* 039821 P 9
LEVEL IN RIVER SAMPLE EXCEEDS CONTROL VALVE AT THREE MILE ISLAND 1* #TRITIUM 098560 P 22
OF TECHNOLOGY REPORTS REFRIGERATOR EXPLOSION ENDANGERING ISOTOPES* #CASE INSTITUTE 018385 P 5

JOHNS HOPKINS U TRITIUM ACCIDENT* 018386 P 5

1967* # KAMAN NUCLEAR DIV. CITED FOR NON-COMPLIANCE FEBRUARY 28, 020619 P 5
#DISAPPEARANCE OF RADIOACTIVE MATERIAL FROM KELLY AIR FORCE BASE* 010408 P 1
#INTERNE KONTAMINATION MIT TRITIUM* 049549 P 13

#EXPOSURE OF EMPLOYEE TO TRITIUM AT HOFFMANN- LA ROCHE* 097789 P 22
2.25 CURIES OF TRITIUM IMPLODES AT RADIOPHARMACEUTICAL LAB.* #FLASK CONTAINING 048268 P 12
#A COBALT AND A TRITIUM INCIDENT AT ARGONNE NATIONAL LABORATORY* 049659 P 13
RESPONSE TO AEC LETTER ABOUT APPARENT NONCOMPLIANCE (WARNER- LAMBERT RES. INST.)* # 077252 P 19
10CFR20 (TRITIUM)* #T.R. SCHWALM OF LANCASTER, PA. CITED FOR NONCOMPLIANCE WITH LICENSE AND 037494 P 8
#INADEQUATE RADIATION CONTROL, TR SCHWALM, INC., LANCASTER, PA.* 008009 P 1
#U.S. RADIUM CORPORATION TRITIUM LEAK AND STACK-DISCHARGE* 015085 P 3
#HEAT EXCHANGER TUBE LEAK AT NBS* 066846 P 17
RESEARCH REACTOR* # LEAK IN PRIMARY HEAT EXCHANGER, NATL. BUR. STANDARDS 064649 P 16
#ELECTRONS CO. ALLOWED TOO MUCH TIME BETWEEN LEAK TESTS* 069892 P 18
#TRITIUM RELEASE FROM MIT REACTOR DUE TO HEAT EXCHANGER LEAK* 021715 P 6
#MIT REACTOR HEAT EXCHANGER LEAK, FEBRUARY 21-23, 1967* 015010 P 3
#TRITIUM LEAKING FROM PENETRATION AT FT. ST. VRAIN* 100916 P 23
WORKERS AND WORK AREA* # LEAKY VIAL OF TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF 048251 P 12
INST.)* #RESPONSE TO AEC LETTER ABOUT APPARENT NONCOMPLIANCE (WARNER-LAMBERT RES. 077252 P 19
ISLAND 1* #TRITIUM LEVEL IN RIVER SAMPLE EXCEEDS CONTROL VALVE AT THREE MILE 098560 P 22
#SHIPMENT RADIATION LEVELS 20 R/HR* 032284 P 7
T.R. SCHWALM OF LANCASTER, PA. CITED FOR NONCOMPLIANCE WITH LICENSE AND 10CFR20 (TRITIUM)* # 037494 P 8
IN LICENSE* #NONCOMPLIANCE OF LICENSE BY NON-CERTIFICATION OF SPECIFICATIONS DESCRIBED 039429 P 8
#NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE* 041359 P 9
#NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE* 041560 P 10
#NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE* 041148 P 9
#NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE* 041563 P 10
#MATTHEY BISHOP POSSESSED TRITIUM WITHOUT LICENSE* 057036 P 13
#POSSESSION OF SOURCE WITHOUT A LICENSE* 041365 P 10
LICENSE BY NON-CERTIFICATION OF SPECIFICATIONS DESCRIBED IN LICENSE* #NONCOMPLIANCE OF 039429 P 8
#MAN AT U.S. RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT WHILE REPAIRING EQUIPMENT* 043005 P 11
#TRACE LIQUID RADIOACTIVE WASTE (TRITIUM) TO DUMP* 010831 P 7
#UNMONITORED LIQUID WASTE RELEASE* 061448 P 14
#US RADIUM CORP. LISTS 87 TRITIUM RELEASES JULY - DECEMBER 1966* 015311 P 3
#REPORTED LOSS AND SUBSEQUENT RECOVERY OF 2 TRITIUM SOURCES* 038745 P 8
LOSS OF COMPASSES CONTAINING TRITIUM BY THE AIR FORCE* 064666 P 16
FORCE* # LOSS OF EMERGENCY EXIT SIGN CONTAINING TRITIUM BY THE AIR 086176 P 22
#PROBABLE LOSS OF TRITIUM DURING SHIPMENT* 078594 P 20
#NATL. BUREAU OF STANDARDS REPORTS LOSS OF TWO STANDARD SAMPLES OF TRITIATED WATER* 064638 P 15
#NORTHWESTERN UNIVERSITY TRITIUM SOURCE LOSS* 011788 P 2
#TRITIUM SOURCE LOST IN SHIPMENT TO TEMPLE UNIVERSITY* 077993 P 20

LIMIT WHILE REPAIRING EQUIPMENT* # MAN AT U.S. RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE 043005 P 11
#EMPLOYEES INHALE AIRBORNE RADIOACTIVE MATERIAL (TRITIUM)* 038079 P 8
#DISAPPEARANCE OF RADIOACTIVE MATERIAL FROM KELLY AIR FORCE BASE* 010408 P 1
#NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE* 041359 P 9
#NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE* 041148 P 9
#NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE* 041563 P 10
#NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE* 041560 P 10
MATTHEY BISHOP POSSESSED TRITIUM WITHOUT LICENSE* 057036 P 13
#CHEMIST HAS UPTAKE OF 767 MICROCURIES OF TRITIUM OVER A 49-HR PERIOD* 063637 P 15
LEVEL IN RIVER SAMPLE EXCEEDS CONTROL VALVE AT THREE MILE ISLAND 1* #TRITIUM 098560 P 22
#N S SAVANNAH CHANGE 5 - MISC. ADMINISTRATION AND TESTING* 014861 P 2

DISCHARGE OF TRITIUM TO SEWER*	$ MIT GRANTED EXEMPTION FROM 10CFR 20 PROVISIONS RELATING TO	017511 P 4
$TRITIUM RELEASE FROM	MIT REACTOR DUE TO HEAT EXCHANGER LEAK*	021715 P 6
	$ MIT REACTOR HEAT EXCHANGER LEAK, FEBRUARY 21-23, 1967*	015010 P 3
$FOUR OVEREXPOSED TO TRITIUM AT	MIT RESEARCH REACTOR, MAY 24, 1971*	064826 P 16
$INTERNE KONTAMINATION	MIT TRITIUM*	049549 P 13
WORKED IN HIGH AIR CONCENTRATION OF TRITIUM (4 TIMES THE	MPC FOR AIR)* $EMPLOYEE	076467 P 18
$ELECTRONS CO. ALLOWED TOO	MUCH TIME BETWEEN LEAK TESTS*	069892 P 18
$A COBALT AND A TRITIUM INCIDENT AT ARGONNE	NATIONAL LABORATORY*	049659 P 13
$LEAK IN PRIMARY HEAT EXCHANGER,	NATL. BUR. STANDARDS RESEARCH REACTOR*	064649 P 16
SAMPLES OF TRITIATED WATER*	$ NATL. BUREAU OF STANDARDS REPORTS LOSS OF TWO STANDARD	064638 P 15
$HEAT EXCHANGER TUBE LEAK AT	NBS*	066846 P 17
AUGUST 8, 1966*	$ NEW ENGLAND NUCLEAR CORPORATION CITED FOR NONCOMPLIANCE,	011949 P 2
$TWO TRITIUM EXPOSURE INCIDENTS AT	NEW ENGLAND NUCLEAR CORPORATION*	077983 P 20
$TRITIUM EXPOSURES AT	NEW ENGLAND NUCLEAR CORPORATION, OCTOBER 1966*	013446 P 2
WORKERS WERE OVEREXPOSED*	$ NEW ENGLAND NUCLEAR REPORTS THREE INCIDENTS IN WHICH	059951 P 14
$TECHNICIAN EXPOSED TO TRITIUM AT	NEW ENGLAND NUCLEAR*	084741 P 21
	$ NON COMPLIANCE CITATION OF US RADIUM*	025349 P 6
$NONCOMPLIANCE OF LICENSE BY	NON-CERTIFICATION OF SPECIFICATIONS DESCRIBED IN LICENSE*	039429 P 8
$KAMAN NUCLEAR DIV. CITED FOR	NON-COMPLIANCE FEBRUARY 28, 1967*	020619 P 5
$TRACERLAB CITED FOR	NON-COMPLIANCE MARCH 7, 1967*	020620 P 5
$T. R. SCHWALM CITED FOR	NON-COMPLIANCE*	016660 P 4
$RESPONSE TO AEC LETTER ABOUT APPARENT	NONCOMPLIANCE (WARNER-LAMBERT RES. INST.)*	077252 P 19
POSSESSION OF TRITIUM*	$ NONCOMPLIANCE CITATION FOR UNAUTHORIZED TRANSFER AND	036066 P 7
	$ NONCOMPLIANCE CITATION*	028573 P 7
$RESPONSE TO AEC	NONCOMPLIANCE CITATION*	055009 P 13
SPECIFICATIONS DESCRIBED IN LICENSE*	$ NONCOMPLIANCE OF LICENSE BY NON-CERTIFICATION OF	039429 P 8
	$ NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE*	041359 P 9
	$ NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE*	041148 P 9
	$ NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE*	041563 P 10
	$ NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE*	041560 P 10
$T.R. SCHWALM OF LANCASTER, PA. CITED FOR	NONCOMPLIANCE WITH LICENSE AND 10CFR20 (TRITIUM)*	037494 P 8
ILLINOIS*	$ NONCOMPLIANCE WITH RADIATION SAFETY STANDARDS AT U OF	064457 P 15
$NEW ENGLAND NUCLEAR CORPORATION CITED FOR	NONCOMPLIANCE, AUGUST 8, 1966*	011949 P 2
	$ NORTHWESTERN UNIVERSITY TRITIUM SOURCE LOSS*	011788 P 2
$QUARTERLY SAMPLE FOR TRITIUM	NOT TAKEN ON TIME AT COOPER*	099674 P 23
* $NEW ENGLAND	NUCLEAR CORPORATION CITED FOR NONCOMPLIANCE, AUGUST 8, 1966	011949 P 2
$TWO TRITIUM EXPOSURE INCIDENTS AT NEW ENGLAND	NUCLEAR CORPORATION*	077983 P 20
$TRITIUM EXPOSURES AT NEW ENGLAND	NUCLEAR CORPORATION, OCTOBER 1966*	013446 P 2
$KAMAN	NUCLEAR DIV. CITED FOR NON-COMPLIANCE FEBRUARY 28, 1967*	020619 P 5
$SEWAGE WATER CONTAMINATED AT	NUCLEAR FUELS SERVICES, INC. (BETA, STRONTIUM, TRITIUM)*	063647 P 15
$YANKEE	NUCLEAR POWER STATION OPERATION REPORT NO. 71*	015996 P 3
OVEREXPOSED* $NEW ENGLAND	NUCLEAR REPORTS THREE INCIDENTS IN WHICH WORKERS WERE	059951 P 14
$TECHNICIAN EXPOSED TO TRITIUM AT NEW ENGLAND	NUCLEAR*	084741 P 21
$SELECTED YANKEE	OPERATING EXPERIENCE.*	016404 P 4
$YANKEE NUCLEAR POWER STATION	OPERATION REPORT NO. 71*	015996 P 3
$CHEMIST HAS UPTAKE OF 767 MICROCURIES OF TRITIUM	OVER A 49-HR PERIOD*	063637 P 15
$U. S. RADIUM CORPORATION EMPLOYEE RECEIVES	OVERDOSE OF TRITIUM*	038078 P 8
1971* $FOUR	OVEREXPOSED TO TRITIUM AT MIT RESEARCH REACTOR, MAY 24,	064826 P 16
$STUDENT	OVEREXPOSED TO TRITIUM AT UNIVERSITY OF VIRGINIA*	076525 P 19
NUCLEAR REPORTS THREE INCIDENTS IN WHICH WORKERS WERE	OVEREXPOSED* $NEW ENGLAND	059951 P 14
$TWO	OVEREXPOSURES REPORTED (AIRBORNE EFFLUENT, TRITIUM)*	047157 P 11
TRITIUM)* $T.R. SCHWALM OF LANCASTER,	PA. CITED FOR NONCOMPLIANCE WITH LICENSE AND 10CFR20 (	037494 P 8
$INADEQUATE RADIATION CONTROL, TR SCHWALM, INC., LANCASTER,	PA.*	008009 P 1
PENNSYLVANIA STATE UNIVERSITY RECEIVES TRITIUM CONTAMINATED	PACKAGE*	$ 017373 P 4
$CONTAMINATION AT TRITIUM	PAINTING ESTABLISHMENT*	041645 P 10
$AEC ASKED TO REVIEW CORRECTIVE ACTIONS PROPOSED BY DIAL-	PAINTING FACILITY*	010376 P 1
$CORRESPONDENCE ON TRITIUM	PAINTING*	030279 P 7
$ACCIDENT ANALYSIS - RUPTURE OF SIRW TANK (	PALISADES POINT)*	072428 P 18
FUEL ELEMENTS AND DECONTAMINATION OF THE REACTOR DIORIT (	PART I(* $DEFECTIVE	060110 P 14
FOLLOWING THE ACCIDENT AT WINDSCALE* $A	PEAK IN THE TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN	015289 P 3
$CIVIL	PENALITIES IMPOSED ON THEODORE R. SCHWALM, INC.*	084884 P 21
EXCESSIVE TRITIUM RELEASES* $CIVIL	PENALTY IMPOSED ON THEODORE R. SCHWALM, INC., FOR	085939 P 22
$TRITIUM LEAKING FROM	PENETRATION AT FT. ST. VRAIN*	100916 P 23
CONTAMINATED PACKAGE*	$ PENNSYLVANIA STATE UNIVERSITY RECEIVES TRITIUM	017373 P 4
	$ PERSONNEL EXPOSURE TO AIRBORNE ACTIVITY*	064095 P 15
	$ PERSONNEL EXPOSURE TO TRITIUM*	049915 P 13
$REPORT OF	PERSONNEL EXPOSURE*	068987 P 18
$REPORT OF	PERSONNEL EXPOSURE*	087511 P 22
$CONTAMINATION OF TWO	PERSONS WITH TRITIUM*	044648 P 11
$POWER REACTOR REGULATION — HARRIS	PLANT, EPA CONCERNS*	078991 P 20
$REFUELING AND REPAIRS OF THE	PM-3A DURING THE 1964-65 AUSTRAL SUMMER*	007703 P 1
$UNSCHEDULED RELEASE OF RADIOACTIVE WASTE AT	POINT BEACH*	065550 P 16
$ACCIDENT ANALYSIS - RUPTURE OF SIRW TANK (PALISADES	POINT)*	072428 P 18
$MATTHEY BISHOP	POSSESSED TRITIUM WITHOUT LICENSE*	057036 P 13
	$ POSSESSION OF SOURCE WITHOUT A LICENSE*	041365 P 10
$UNAUTHORIZED	POSSESSION OF TRITIUM TARGET*	041159 P 9

#NONCOMPLIANCE CITATION FOR UNAUTHORIZED TRANSFER AND	POSSESSION OF TRITIUM*	036066 P 7
#DIVISION OF COMPLIANCE CITES COMPANY FOR UNAUTHORIZED	POSSESSION OF TRITIUM*	010640 P 1
#	POWER REACTOR REGULATION -- HARRIS PLANT, EPA CONCERNS*	078991 P 20
#YANKEE NUCLEAR	POWER STATION OPERATION REPORT NO. 71*	015996 P 3
REACTOR* #LEAK IN	PRIMARY HEAT EXCHANGER, NATL. BUR. STANDARDS RESEARCH	064649 P 16
#	PROBABLE LOSS OF TRITIUM DURING SHIPMENT*	078594 P 20
#AEC ASKED TO REVIEW CORRECTIVE ACTIONS	PROPOSED BY DIAL-PAINTING FACILITY*	010376 P 1
#MIT GRANTED EXEMPTION FROM 10CFR 20	PROVISIONS RELATING TO DISCHARGE OF TRITIUM TO SEWER*	017511 P 4
#	QUANTITY OF TRITIUM IMPORTED FOR FISCAL YEAR 1968*	040450 P 9
#T.	R. SCHWALM CITED FOR NON-COMPLIANCE*	016660 P 4
#T.	R. SCHWALM REPLIES TO COMPLIANCE CITATION OF MAY 11, 1967*	017116 P 4
#CIVIL PENALITIES IMPOSED ON THEODORE	R. SCHWALM, INC.*	084884 P 21
#CIVIL PENALTY IMPOSED ON THEODORE	R. SCHWALM, INC., FOR EXCESSIVE TRITIUM RELEASES*	085939 P 22
#SHIPMENT RADIATION LEVELS 20	R/HR*	032284 P 7
#INADEQUATE	RADIATION CONTROL, TR SCHWALM, INC., LANCASTER, PA.*	008009 P 1
#SHIPMENT	RADIATION LEVELS 20 R/HR*	032284 P 7
#AEC INSPECTION CALLS FOR RE-EVALUATION OF COMPANY	RADIATION SAFETY PROGRAM*	048187 P 12
#NONCOMPLIANCE WITH	RADIATION SAFETY STANDARDS AT U OF ILLINOIS*	064457 P 15
#CONTROL OF	RADIATION SAFETY*	041562 P 10
#EMPLOYEES INHALE AIRBORNE	RADIOACTIVE MATERIAL (TRITIUM)*	038079 P 8
#DISAPPEARANCE OF	RADIOACTIVE MATERIAL FROM KELLY AIR FORCE BASE*	010408 P 1
#TRACE LIQUID	RADIOACTIVE WASTE (TRITIUM) TO DUMP*	010831 P 2
#UNSCHEDULED RELEASE OF	RADIOACTIVE WASTE AT POINT BEACH*	065550 P 16
#FLASK CONTAINING 2.25 CURIES OF TRITIUM IMPLODES AT	RADIOPHARMACEUTICAL LAB.*	048268 P 12
1967* #US	RADIUM CORP REPORTS EXCESSIVE TRITIUM RELEASES SEPT 27/28,	021658 P 6
REPAIRING EQUIPMENT* #MAN AT U.S.	RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT WHILE	043005 P 11
* #US	RADIUM CORP. LISTS 87 TRITIUM RELEASES JULY - DECEMBER 1966	015311 P 3
#U.S.	RADIUM CORP. REPORTS 6 EXCESSIVE STACK DISCHARGES*	021719 P 6
#EXPOSURE TO TRITIUM AT UNITED STATES	RADIUM CORP.*	074185 P 19
#FLOOD DAMAGE AT U.S.	RADIUM CORP.*	076230 P 19
#U. S.	RADIUM CORPORATION EMPLOYEE RECEIVES OVERDOSE OF TRITIUM*	038078 P 8
TRITIUM* #U.S.	RADIUM CORPORATION REPORTS EXCESSIVE STACK DISCHARGE OF	016661 P 4
#U.S.	RADIUM CORPORATION TRITIUM LEAK AND STACK-DISCHARGE*	015085 P 3
#NON COMPLIANCE CITATION OF US	RADIUM*	025349 P 6
#AEC INSPECTION CALLS FOR	RE-EVALUATION OF COMPANY RADIATION SAFETY PROGRAM*	048187 P 12
#DEFECTIVE FUEL ELEMENTS AND DECONTAMINATION OF THE	REACTOR DIORIT (PART I(*	060110 P 14
#TRITIUM RELEASE FROM MIT	REACTOR DUE TO HEAT EXCHANGER LEAK*	021715 P 6
#MIT	REACTOR HEAT EXCHANGER LEAK, FEBRUARY 21-23, 1967*	015010 P 3
#POWER	REACTOR REGULATION -- HARRIS PLANT, EPA CONCERNS*	078991 P 20
IN PRIMARY HEAT EXCHANGER, NATL. BUR. STANDARDS RESEARCH	REACTOR* #LEAK	064649 P 16
#FOUR OVEREXPOSED TO TRITIUM AT MIT RESEARCH	REACTOR, MAY 24, 1971*	064826 P 16
#CHEMIST	RECEIVES INTERNAL EXPOSURE FROM TRITIUM*	068458 P 17
#TECHNICIAN	RECEIVES INTERNAL TRITIUM EXPOSURE*	078456 P 20
#U. S. RADIUM CORPORATION EMPLOYEE	RECEIVES OVERDOSE OF TRITIUM*	038078 P 8
#PENNSYLVANIA STATE UNIVERSITY	RECEIVES TRITIUM CONTAMINATED PACKAGE*	017373 P 4
#REPORTED LOSS AND SUBSEQUENT	RECOVERY OF 2 TRITIUM SOURCES*	038745 P 8
#CASE INSTITUTE OF TECHNOLOGY REPORTS	REFRIGERATOR EXPLOSION ENDANGERING ISOTOPES*	018385 P 5
AUSTRAL SUMMER* #	REFUELING AND REPAIRS OF THE PM-3A DURING THE 1964-65	007703 P 1
#POWER REACTOR	REGULATION -- HARRIS PLANT, EPA CONCERNS*	078991 P 20
#MIT GRANTED EXEMPTION FROM 10CFR 20 PROVISIONS	RELATING TO DISCHARGE OF TRITIUM TO SEWER*	017511 P 4
#TRITIUM	RELEASE FROM MIT REACTOR DUE TO HEAT EXCHANGER LEAK*	021715 P 6
#UNSCHEDULED	RELEASE OF RADIOACTIVE WASTE AT POINT BEACH*	065550 P 16
#UNMONITORED LIQUID WASTE	RELEASE*	061448 P 14
SAMPLING PROGRAM FOLLOWING AN ACCIDENTAL TRITIUM	RELEASE* #ENVIRONMENTAL	066691 P 17
#US RADIUM CORP. LISTS 87 TRITIUM	RELEASES JULY - DECEMBER 1966*	015311 P 3
#US RADIUM CORP REPORTS EXCESSIVE TRITIUM	RELEASES SEPT 27/28, 1967*	021658 P 6
IMPOSED ON THEODORE R. SCHWALM, INC., FOR EXCESSIVE TRITIUM	RELEASES* #CIVIL PENALTY	085939 P 22
RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT WHILE	REPAIRING EQUIPMENT* #MAN AT U.S.	043005 P 11
#REFUELING AND	REPAIRS OF THE PM-3A DURING THE 1964-65 AUSTRAL SUMMER*	007703 P 1
#YANKEE STEAM GENERATOR TUBE	REPAIRS*	020722 P 5
#T. R. SCHWALM	REPLIES TO COMPLIANCE CITATION OF MAY 11, 1967*	017116 P 4
#TWO OVEREXPOSURES	REPORTED (AIRBORNE EFFLUENT, TRITIUM)*	047157 P 11
#	REPORTED LOSS AND SUBSEQUENT RECOVERY OF 2 TRITIUM SOURCES*	038745 P 8
#U.S. RADIUM CORPORATION	REPORTS EXCESSIVE STACK DISCHARGE OF TRITIUM*	016661 P 4
#US RADIUM CORP	REPORTS EXCESSIVE TRITIUM RELEASES SEPT 27/28, 1967*	021658 P 6
#NATL. BUREAU OF STANDARDS	REPORTS LOSS OF TWO STANDARD SAMPLES OF TRITIATED WATER*	064638 P 15
#CASE INSTITUTE OF TECHNOLOGY	REPORTS REFRIGERATOR EXPLOSION ENDANGERING ISOTOPES*	018385 P 5
#NEW ENGLAND NUCLEAR	REPORTS THREE INCIDENTS IN WHICH WORKERS WERE OVEREXPOSED*	059951 P 14
#U.S. RADIUM CORP.	REPORTS 6 EXCESSIVE STACK DISCHARGES*	021718 P 6
#CORRECTIVE ACTION TO VIOLATIONS OF AEC	REQUIREMENTS*	084823 P 21
#CORRECTIVE ACTION TO VIOLATIONS OF AEC	REQUIREMENTS*	084798 P 21
TO AEC LETTER ABOUT APPARENT NONCOMPLIANCE (WARNER-LAMBERT	RES. INST.)* #RESPONSE	077252 P 19
#LEAK IN PRIMARY HEAT EXCHANGER, NATL. BUR. STANDARDS	RESEARCH REACTOR*	064649 P 16
#FOUR OVEREXPOSED TO TRITIUM AT MIT	RESEARCH REACTOR, MAY 24, 1971*	064826 P 16
WARNER-LAMBERT RES. INST.)* #	RESPONSE TO AEC LETTER ABOUT APPARENT NONCOMPLIANCE (	077252 P 19
#	RESPONSE TO AEC NONCOMPLIANCE CITATION*	055009 P 13
FACILITY* #AEC ASKED TO	REVIEW CORRECTIVE ACTIONS PROPOSED BY DIAL-PAINTING	010376 P 1
#TRITIUM LEVEL IN	RIVER SAMPLE EXCEEDS CONTROL VALVE AT THREE MILE ISLAND 1*	098560 P 22
#EXPOSURE OF EMPLOYEE TO TRITIUM AT HOFFMANN-LA	ROCHE*	097789 P 22
#VIOLATION OF CONTAINMENT AT YANKEE	ROWE (AO 73-1)*	080114 P 20

#ACCIDENT ANALYSIS - RUPTURE OF SIRW TANK (PALISADES POINT)* 072428 P 18

* #U. S. RADIUM CORPORATION EMPLOYEE RECEIVES OVERDOSE OF TRITIUM 038078 P 8
AEC INSPECTION CALLS FOR RE-EVALUATION OF COMPANY RADIATION SAFETY PROGRAM* # 048187 P 12
#NONCOMPLIANCE WITH RADIATION SAFETY STANDARDS AT U OF ILLINOIS* 064457 P 15
#CONTROL OF RADIATION SAFETY* 061562 P 10
#TRITIUM LEVEL IN RIVER SAMPLE EXCEEDS CONTROL VALVE AT THREE MILE ISLAND 1* 098560 P 22
#QUARTERLY SAMPLE FOR TRITIUM NOT TAKEN ON TIME AT COOPER* 099674 P 23
#NATL. BUREAU OF STANDARDS REPORTS LOSS OF TWO STANDARD SAMPLES OF TRITIATED WATER* 064638 P 15
#ENVIRONMENTAL SAMPLING PROGRAM FOLLOWING AN ACCIDENTAL TRITIUM RELEASE* 066691 P 17
#N S SAVANNAH CHANGE 5 - MISC. ADMINISTRATION AND TESTING* 014861 P 2
#T. R. SCHWALM CITED FOR NON-COMPLIANCE* 016660 P 4
LICENSE AND 10CFR20 (TRITIUM)* #T.R. SCHWALM OF LANCASTER, PA. CITED FOR NONCOMPLIANCE WITH 037494 P 8
#T. R. SCHWALM REPLIES TO COMPLIANCE CITATION OF MAY 11, 1967* 017116 P 4
#CIVIL PENALITIES IMPOSED ON THEODORE R. SCHWALM, INC.* 084884 P 21
#CIVIL PENALTY IMPOSED ON THEODORE R. SCHWALM, INC., FOR EXCESSIVE TRITIUM RELEASES* 085939 P 22
#INADEQUATE RADIATION CONTROL, TR SCHWALM, INC., LANCASTER, PA.* 008009 P 1
SELECTED TOPICS OF INTEREST* 027525 P 6
SELECTED YANKEE OPERATING EXPERIENCE.* 016404 P 4
#US RADIUM CORP REPORTS EXCESSIVE TRITIUM RELEASES SEPT 27/28, 1967* 021658 P 6
#SEWAGE WATER CONTAMINATED AT NUCLEAR FUELS SERVICES, INC. (BETA, STRONTIUM, TRITIUM)* 063647 P 15
BETA, STRONTIUM, TRITIUM)* # SEWAGE WATER CONTAMINATED AT NUCLEAR FUELS SERVICES, INC. (063647 P 15
10CFR 20 PROVISIONS RELATING TO DISCHARGE OF TRITIUM TO SEWER* #MIT GRANTED EXEMPTION FROM 017511 P 4
SHIPMENT RADIATION LEVELS 20 R/HR* 032284 P 7
#TRITIUM SOURCE LOST IN SHIPMENT TO TEMPLE UNIVERSITY* 077993 P 20
#PROBABLE LOSS OF TRITIUM DURING SHIPMENT* 078594 P 20
#LOSS OF EMERGENCY EXIT SIGN CONTAINING TRITIUM BY THE AIR FORCE* 086176 P 22
#IMPORTATION OF COMPASSES CONTAINING TRITIUM BY SILVA* 077662 P 19
#ACCIDENT ANALYSIS - RUPTURE OF SIRW TANK (PALISADES POINT)* 072428 P 18
#LEAKY VIAL OF TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF WORKERS AND WORK AREA* 048251 P 12
#NORTHWESTERN UNIVERSITY TRITIUM SOURCE LOSS* 011788 P 2
#TRITIUM SOURCE LOST IN SHIPMENT TO TEMPLE UNIVERSITY* 077993 P 20
#POSSESSION OF SOURCE WITHOUT A LICENSE* 041365 P 10
#REPORTED LOSS AND SUBSEQUENT RECOVERY OF 2 TRITIUM SOURCES* 038745 P 8
#NONCOMPLIANCE OF LICENSE BY NON-CERTIFICATION OF SPECIFICATIONS DESCRIBED IN LICENSE* 039429 P 8
#TRITIUM LEAKING FROM PENETRATION AT FT. ST. VRAIN* 100916 P 23
#U.S. RADIUM CORPORATION REPORTS EXCESSIVE STACK DISCHARGE OF TRITIUM* 016661 P 4
#U.S. RADIUM CORP. REPORTS 6 EXCESSIVE STACK DISCHARGES* 021718 P 6
#U.S. RADIUM CORPORATION TRITIUM LEAK AND STACK-DISCHARGE* 015085 P 3
#NATL. BUREAU OF STANDARDS REPORTS LOSS OF TWO STANDARD SAMPLES OF TRITIATED WATER* 064638 P 15
#NONCOMPLIANCE WITH RADIATION SAFETY STANDARDS AT U OF ILLINOIS* 064457 P 15
TRITIATED WATER* #NATL. BUREAU OF STANDARDS REPORTS LOSS OF TWO STANDARD SAMPLES OF 064638 P 15
#LEAK IN PRIMARY HEAT EXCHANGER, NATL. BUR. STANDARDS RESEARCH REACTOR* 064649 P 16
#PENNSYLVANIA STATE UNIVERSITY RECEIVES TRITIUM CONTAMINATED PACKAGE* 017373 P 4
#TRITIUM IMPORTED INTO UNITED STATES FOR USE IN TIMEPIECES* 039821 P 9
#EXPOSURE TO TRITIUM AT UNITED STATES RADIUM CORP.* 076185 P 18
#YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 71* 015996 P 3
#YANKEE STEAM GENERATOR TUBE REPAIRS* 020722 P 5
WATER CONTAMINATED AT NUCLEAR FUELS SERVICES, INC. (BETA, STRONTIUM, TRITIUM)* #SEWAGE 063647 P 15
STUDENT OVEREXPOSED TO TRITIUM AT UNIVERSITY OF VIRGINIA* 076525 P 19
#REPORTED LOSS AND SUBSEQUENT RECOVERY OF 2 TRITIUM SOURCES* 038745 P 8
AND REPAIRS OF THE PM-3A DURING THE 1964-65 AUSTRAL SUMMER* #REFUELING 007703 P 1

T. R. SCHWALM CITED FOR NON-COMPLIANCE* 016660 P 4
1967* # T. R. SCHWALM REPLIES TO COMPLIANCE CITATION OF MAY 11, 017116 P 4
WITH LICENSE AND 10CFR20 (TRITIUM)* # T.R. SCHWALM OF LANCASTER, PA. CITED FOR NONCOMPLIANCE 037494 P 8
#TITANIUM TRITIDE CONTAMINATES TABLE TOP* 064645 P 16
#QUARTERLY SAMPLE FOR TRITIUM NOT TAKEN ON TIME AT COOPER* 099674 P 23
#ACCIDENT ANALYSIS - RUPTURE OF SIRW TANK (PALISADES POINT)* 072428 P 18
#UNAUTHORIZED POSSESSION OF TRITIUM TARGET* 041159 P 9
TECHNICIAN EXPOSED TO TRITIUM AT NEW ENGLAND NUCLEAR* 084741 P 21
TECHNICIAN RECEIVES INTERNAL TRITIUM EXPOSURE* 078456 P 20
#EXPOSURE OF TWO TECHNICIANS TO TRITIUM* 048261 P 12
ISOTOPES* #CASE INSTITUTE OF TECHNOLOGY REPORTS REFRIGERATOR EXPLOSION ENDANGERING 018385 P 5
#TRITIUM SOURCE LOST IN SHIPMENT TO TEMPLE UNIVERSITY* 077993 P 20
#N S SAVANNAH CHANGE 5 - MISC. ADMINISTRATION AND TESTING* 014861 P 2
#ELECTRONS CO. ALLOWED TOO MUCH TIME BETWEEN LEAK TESTS* 069892 P 18
#CIVIL PENALITIES IMPOSED ON THEODORE R. SCHWALM, INC.* 084884 P 21
#CIVIL PENALTY IMPOSED ON THEODORE R. SCHWALM, INC., FOR EXCESSIVE TRITIUM RELEASES* 085939 P 22
#NEW ENGLAND NUCLEAR REPORTS THREE INCIDENTS IN WHICH WORKERS WERE OVEREXPOSED* 059951 P 14
#TRITIUM LEVEL IN RIVER SAMPLE EXCEEDS CONTROL VALVE AT THREE MILE ISLAND 1* 098560 P 22
#QUARTERLY SAMPLE FOR TRITIUM NOT TAKEN ON TIME AT COOPER* 099674 P 23
#ELECTRONS CO. ALLOWED TOO MUCH TIME BETWEEN LEAK TESTS* 069892 P 18
#TRITIUM IMPORTED INTO UNITED STATES FOR USE IN TIMEPIECES* 039821 P 9
#EMPLOYEE WORKED IN HIGH AIR CONCENTRATION OF TRITIUM (4 TIMES THE MPC FOR AIR)* 076467 P 18
#MAN AT U.S. RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT WHILE REPAIRING EQUIPMENT* 043005 P 11
TITANIUM TRITIDE CONTAMINATES TABLE TOP* 064645 P 16
#ELECTRONS CO. ALLOWED TOO MUCH TIME BETWEEN LEAK TESTS* 069892 P 18
#TITANIUM TRITIDE CONTAMINATES TABLE TOP* 064645 P 16
#SELECTED TOPICS OF INTEREST* 027525 P 6
#INADEQUATE RADIATION CONTROL, TR SCHWALM, INC., LANCASTER, PA.* 008009 P 1
TRACE LIQUID RADIOACTIVE WASTE (TRITIUM) TO DUMP* 010831 P 2

#	TRACERLAB CITED FOR NON-COMPLIANCE MARCH 7, 1967*	020620 P 5
#NONCOMPLIANCE CITATION FOR UNAUTHORIZED	TRANSFER AND POSSESSION OF TRITIUM*	036066 P 7
#ACCIDENTAL INTAKE OF	TRITIATED WATER (HPIS/63)*	067194 P 17
#CHEMIST EXPOSED TO	TRITIATED WATER*	076509 P 19
#AN ACCIDENTAL INTAKE OF	TRITIATED WATER*	047229 P 11
BUREAU OF STANDARDS REPORTS LOSS OF TWO STANDARD SAMPLES OF	TRITIATED WATER* #NATL.	064638 P 15
#TITANIUM	TRITIDE CONTAMINATES TABLE TOP*	064645 P 16
#EMPLOYEE WORKED IN HIGH AIR CONCENTRATION OF	TRITIUM (4 TIMES THE MPC FOR AIR)*	076467 P 18
#JOHNS HOPKINS U	TRITIUM ACCIDENT*	018386 P 5
#CONTAMINATION IN UNRESTRICTED AREA AND	TRITIUM ACTIVITY*	063198 P 14
#EXPOSURE OF EMPLOYEE TO	TRITIUM AT HOFFMANN-LA ROCHE*	097789 P 22
#FOUR OVEREXPOSED TO	TRITIUM AT MIT RESEARCH REACTOR, MAY 24, 1971*	064826 P 16
#TECHNICIAN EXPOSED TO	TRITIUM AT NEW ENGLAND NUCLEAR*	084741 P 21
#EXPOSURE TO	TRITIUM AT UNITED STATES RADIUM CORP.*	074185 P 18
#STUDENT OVEREXPOSED TO	TRITIUM AT UNIVERSITY OF VIRGINIA*	076525 P 19
#IMPORTATION OF COMPASSES CONTAINING	TRITIUM BY SILVA*	077662 P 19
#LOSS OF EMERGENCY EXIT SIGN CONTAINING	TRITIUM BY THE AIR FORCE*	086176 P 22
#LOSS OF COMPASSES CONTAINING	TRITIUM BY THE AIR FORCE*	064666 P 16
#PENNSYLVANIA STATE UNIVERSITY RECEIVES	TRITIUM CONTAMINATED PACKAGE*	017373 P 4
ACCIDENT AT WINDSCALE* #A PEAK IN THE	TRITIUM CONTENT OF ATMOSPHERIC HYDROGEN FOLLOWING THE	015289 P 3
#PROBABLE LOSS OF	TRITIUM DURING SHIPMENT*	078594 P 20
CORPORATION* #TWO	TRITIUM EXPOSURE INCIDENTS AT NEW ENGLAND NUCLEAR	077983 P 20
#TECHNICIAN RECEIVES INTERNAL	TRITIUM EXPOSURE*	078456 P 20
OCTOBER 1966* #	TRITIUM EXPOSURES AT NEW ENGLAND NUCLEAR CORPORATION,	013446 P 2
WORK AREA* #LEAKY VIAL OF	TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF WORKERS AND	048251 P 12
#FLASK CONTAINING 2.25 CURIES OF	TRITIUM IMPLODES AT RADIOPHARMACEUTICAL LAB.*	048268 P 12
#QUANTITY OF	TRITIUM IMPORTED FOR FISCAL YEAR 1968*	040450 P 9
#	TRITIUM IMPORTED INTO UNITED STATES FOR USE IN TIMEPIECES*	039821 P 9
#A COBALT AND A	TRITIUM INCIDENT AT ARGONNE NATIONAL LABORATORY*	049659 P 13
#U.S. RADIUM CORPORATION	TRITIUM LEAK AND STACK-DISCHARGE*	015085 P 3
#	TRITIUM LEAKING FROM PENETRATION AT FT. ST. VRAIN*	100916 P 23
THREE MILE ISLAND 1* #	TRITIUM LEVEL IN RIVER SAMPLE EXCEEDS CONTROL VALVE AT	098560 P 22
#QUARTERLY SAMPLE FOR	TRITIUM NOT TAKEN ON TIME AT COOPER*	099674 P 23
#CHEMIST HAS UPTAKE OF 767 MICROCURIES OF	TRITIUM OVER A 49-HR PERIOD*	063637 P 15
#CONTAMINATION AT	TRITIUM PAINTING ESTABLISHMENT*	041645 P 10
#CORRESPONDENCE ON	TRITIUM PAINTING*	030279 P 7
* #	TRITIUM RELEASE FROM MIT REACTOR DUE TO HEAT EXCHANGER LEAK	021715 P 6
#ENVIRONMENTAL SAMPLING PROGRAM FOLLOWING AN ACCIDENTAL	TRITIUM RELEASE*	066691 P 17
#US RADIUM CORP. LISTS 87	TRITIUM RELEASES JULY - DECEMBER 1966*	015311 P 3
#US RADIUM CORP REPORTS EXCESSIVE	TRITIUM RELEASES SEPT 27/28, 1967*	021658 P 6
PENALTY IMPOSED ON THEODORE R. SCHWALM, INC., FOR EXCESSIVE	TRITIUM RELEASES* #CIVIL	085939 P 22
#NORTHWESTERN UNIVERSITY	TRITIUM SOURCE LOSS*	011788 P 2
#	TRITIUM SOURCE LOST IN SHIPMENT TO TEMPLE UNIVERSITY*	077993 P 20
#REPORTED LOSS AND SUBSEQUENT RECOVERY OF 2	TRITIUM SOURCES*	038745 P 8
#UNAUTHORIZED POSSESSION OF	TRITIUM TARGET*	041159 P 9
EXEMPTION FROM 10CFR 20 PROVISIONS RELATING TO DISCHARGE OF	TRITIUM TO SEWER* #MIT GRANTED	017511 P 4
#MATTHEY BISHOP POSSESSED	TRITIUM WITHOUT LICENSE*	057036 P 13
#U. S. RADIUM CORPORATION EMPLOYEE RECEIVES OVERDOSE OF	TRITIUM*	038078 P 8
#CONTAMINATION OF TWO PERSONS WITH	TRITIUM*	044648 P 11
#EXPOSURE OF AN EMPLOYEE TO	TRITIUM*	044641 P 11
#PERSONNEL EXPOSURE TO	TRITIUM*	049915 P 13
#EXPOSURE OF TWO TECHNICIANS TO	TRITIUM*	048261 P 12
#INTERNE KONTAMINATION MIT	TRITIUM*	049549 P 13
#CHEMIST RECEIVES INTERNAL EXPOSURE FROM	TRITIUM*	068458 P 17
RADIUM CORPORATION REPORTS EXCESSIVE STACK DISCHARGE OF	TRITIUM* #U.S.	016661 P 4
OF COMPLIANCE CITES COMPANY FOR UNAUTHORIZED POSSESSION OF	TRITIUM* #DIVISION	010640 P 1
CITATION FOR UNAUTHORIZED TRANSFER AND POSSESSION OF	TRITIUM* #NONCOMPLIANCE	036066 P 7
#TRACE LIQUID RADIOACTIVE WASTE (	TRITIUM) TO DUMP*	010831 P 2
#TWO OVEREXPOSURES REPORTED (AIRBORNE EFFLUENT,	TRITIUM)*	047157 P 11
#EMPLOYEES INHALE AIRBORNE RADIOACTIVE MATERIAL (	TRITIUM)*	038079 P 8
AT NUCLEAR FUELS SERVICES, INC. (BETA, STRONTIUM,	TRITIUM)* #SEWAGE WATER CONTAMINATED	063647 P 15
PA. CITED FOR NONCOMPLIANCE WITH LICENSE AND 10CFR20 (	TRITIUM)* #T.R. SCHWALM OF LANCASTER,	037494 P 8
#HEAT EXCHANGER	TUBE LEAK AT NBS*	066846 P 17
#YANKEE STEAM GENERATOR	TUBE REPAIRS*	020722 P 5
#	TWO OVEREXPOSURES REPORTED (AIRBORNE EFFLUENT, TRITIUM)*	047157 P 11
#CONTAMINATION OF	TWO PERSONS WITH TRITIUM*	044648 P 11
#NATL. BUREAU OF STANDARDS REPORTS LOSS OF	TWO STANDARD SAMPLES OF TRITIATED WATER*	064638 P 15
#EXPOSURE OF	TWO TECHNICIANS TO TRITIUM*	048261 P 12
CORPORATION* #	TWO TRITIUM EXPOSURE INCIDENTS AT NEW ENGLAND NUCLEAR	077983 P 20
TRITIUM* #	U. S. RADIUM CORPORATION EMPLOYEE RECEIVES OVERDOSE OF	038078 P 8
WHILE REPAIRING EQUIPMENT* #MAN AT	U.S. RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT	043005 P 11
#	U.S. RADIUM CORP. REPORTS 6 EXCESSIVE STACK DISCHARGES*	021718 P 6
#FLOOD DAMAGE AT	U.S. RADIUM CORP.*	076230 P 18
OF TRITIUM* #	U.S. RADIUM CORPORATION REPORTS EXCESSIVE STACK DISCHARGE	016661 P 4
#	U.S. RADIUM CORPORATION TRITIUM LEAK AND STACK-DISCHARGE*	015085 P 3
#	UNAUTHORIZED POSSESSION OF TRITIUM TARGET*	041159 P 9
#DIVISION OF COMPLIANCE CITES COMPANY FOR	UNAUTHORIZED POSSESSION OF TRITIUM*	010640 P 1
#NONCOMPLIANCE CITATION FOR	UNAUTHORIZED TRANSFER AND POSSESSION OF TRITIUM*	036066 P 7
#TRITIUM IMPORTED INTO	UNITED STATES FOR USE IN TIMEPIECES*	039821 P 9
#EXPOSURE TO TRITIUM AT	UNITED STATES RADIUM CORP.*	074185 P 18
#STUDENT OVEREXPOSED TO TRITIUM AT	UNIVERSITY OF VIRGINIA*	076525 P 19
#PENNSYLVANIA STATE	UNIVERSITY RECEIVES TRITIUM CONTAMINATED PACKAGE*	017373 P 4
#NORTHWESTERN	UNIVERSITY TRITIUM SOURCE LOSS*	011788 P 2
#TRITIUM SOURCE LOST IN SHIPMENT TO TEMPLE	UNIVERSITY*	077993 P 20

@	UNMONITORED LIQUID WASTE RELEASE*	061448 P 14
@CONTAMINATION IN	UNRESTRICTED AREA AND TRITIUM ACTIVITY*	063198 P 14
@	UNSCHEDULED RELEASE OF RADIOACTIVE WASTE AT POINT BEACH*	065550 P 16
@CHEMIST HAS	UPTAKE OF 767 MICROCURIES OF TRITIUM OVER A 49-HR PERIOD*	063637 P 15
27/28, 1967* @	US RADIUM CORP REPORTS EXCESSIVE TRITIUM RELEASES SEPT	021658 P 6
1966* @	US RADIUM CORP. LISTS 87 TRITIUM RELEASES JULY - DECEMBER	015311 P 3
@NON COMPLIANCE CITATION OF	US RADIUM*	025349 P 6
@TRITIUM IMPORTED INTO UNITED STATES FOR	USE IN TIMEPIECES*	039821 P 9
@TRITIUM LEVEL IN RIVER SAMPLE EXCEEDS CONTROL	VALVE AT THREE MILE ISLAND 1*	098560 P 22
AND WORK AREA* @LEAKY	VIAL OF TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF WORKERS	048251 P 12
@	VIOLATION OF CONTAINMENT AT YANKEE ROWE (AO 73-1)*	080114 P 20
@CORRECTIVE ACTION TO	VIOLATIONS OF AEC REQUIREMENTS*	084823 P 21
@CORRECTIVE ACTION TO	VIOLATIONS OF AEC REQUIREMENTS*	084798 P 21
@STUDENT OVEREXPOSED TO TRITIUM AT UNIVERSITY OF	VIRGINIA*	076525 P 19
@TRITIUM LEAKING FROM PENETRATION AT FT. ST.	VRAIN*	100916 P 23
@RESPONSE TO AEC LETTER ABOUT APPARENT NONCOMPLIANCE (	WARNER-LAMBERT RES. INST.)*	077252 P 19
@TRACE LIQUID RADIOACTIVE	WASTE (TRITIUM) TO DUMP*	010831 P 2
@UNSCHEDULED RELEASE OF RADIOACTIVE	WASTE AT POINT BEACH*	065550 P 16
@UNMONITORED LIQUID	WASTE RELEASE*	061448 P 14
@ACCIDENTAL INTAKE OF TRITIATED	WATER (HPIS/63)*	067194 P 17
STRONTIUM, TRITIUM)* @SEWAGE	WATER CONTAMINATED AT NUCLEAR FUELS SERVICES, INC. (BETA,	063647 P 15
@AN ACCIDENTAL INTAKE OF TRITIATED	WATER*	047229 P 11
@CHEMIST EXPOSED TO TRITIATED	WATER*	076509 P 19
STANDARDS REPORTS LOSS OF TWO STANDARD SAMPLES OF TRITIATED	WATER* @NATL. BUREAU OF	064638 P 15
@MAN AT U.S. RADIUM CORP. INHALED 1.6 TIMES	WEEKLY EXPOSURE LIMIT WHILE REPAIRING EQUIPMENT*	043005 P 11
ENGLAND NUCLEAR REPORTS THREE INCIDENTS IN WHICH WORKERS	WERE OVEREXPOSED* @NEW	059951 P 14
@NEW ENGLAND NUCLEAR REPORTS THREE INCIDENTS IN	WHICH WORKERS WERE OVEREXPOSED*	059951 P 14
U.S. RADIUM CORP. INHALED 1.6 TIMES WEEKLY EXPOSURE LIMIT	WHILE REPAIRING EQUIPMENT* @MAN AT	043005 P 11
CONTENT OF ATMOSPHERIC HYDROGEN FOLLOWING THE ACCIDENT AT	WINDSCALE* @A PEAK IN THE TRITIUM	015289 P 3
@POSSESSION OF SOURCE	WITHOUT A LICENSE*	041365 P 10
@MATTHEY BISHOP POSSESSED TRITIUM	WITHOUT LICENSE*	057036 P 13
OF TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF WORKERS AND	WORK AREA* @LEAKY VIAL	048251 P 12
MPC FOR AIR)* @EMPLOYEE	WORKED IN HIGH AIR CONCENTRATION OF TRITIUM (4 TIMES THE	076467 P 18
@LEAKY VIAL OF TRITIUM GAS CAUSES SLIGHT CONTAMINATION OF	WORKERS AND WORK AREA*	048251 P 12
@NEW ENGLAND NUCLEAR REPORTS THREE INCIDENTS IN WHICH	WORKERS WERE OVEREXPOSED*	059951 P 14
@	YANKEE NUCLEAR POWER STATION OPERATION REPORT NO. 71*	015996 P 3
@SELECTED	YANKEE OPERATING EXPERIENCE.*	016404 P 4
@VIOLATION OF CONTAINMENT AT	YANKEE ROWE (AO 73-1)*	080114 P 20
@	YANKEE STEAM GENERATOR TUBE REPAIRS*	020722 P 5
@QUANTITY OF TRITIUM IMPORTED FOR FISCAL	YEAR 1968*	040450 P 9

XI Responses to Environmental Impact Questions

XI - RESPONSES TO ENVIRONMENTAL IMPACT QUESTIONS

014585
QUESTION F.3 - ESTIMATE AND JUSTIFY TRITIUM DISCHARGE IN LIQUID
TENNESSEE VALLEY AUTHORITY
4 PAGES, PAGES F.3.1 TO F.3.4 OF BROWNS FERRY CONSTRUCTION PERMIT, AMENDMENT 3, ANSWERS TO AEC QUESTIONS, NOVEMBER 10, 1966, DOCKET NO. 50-259/260

STUDIES INDICATE TRITIUM IN THE LIQUID EFFLUENT IS A MILLIONTH OF THE OFF-SITE MPC (BASED ON ONLY ACTIVATION OF DEUTERIUM). NO SPECIAL MONITORING INSTRUMENTS ARE NECESSARY. EXPERIENCE SHOWS THAT LESS THAN 1% OF THE TRITIUM IN A ZIRCALOY-CLAD FUEL ROD LEAKS OUT BECAUSE OF HYDRIDE FORMATION, WHILE STAINLESS-CLAD FUEL ALLOWS IT TO LEAK.

AVAILABILITY - USAEC-PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

REACTOR, BWR + MONITOR, LIQUID + OPERATING EXPERIENCE SUMMARY + WASTE DISPOSAL, LIQUID + *RESPONSE TO NRC QUESTION + *REPORT, PSAR

016514
QUESTION 17 - RADIATION MONITOR RD4-3 IN LIQUID WASTE SYSTEM.
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C.
6 PAGES, 1 FIGURE, 1 TABLE, 1 REFERENCE, NATIONAL BUREAU OF STANDARDS REACTOR. FINAL SAFETY ANALYSIS REPORT, SUPPL. A, PAGES 17-1/17-6, OCTOBER 1, 1966, DOCKET NO. 50-184

PROVIDE QUANTITATIVE INFORMATION TO SHOW HOW RADIATION MONITOR RD4-3 IN THE LIQUID-WASTE SYSTEM CAN BE SET TO ENSURE THAT THE 10 CFR 20 LIMIT OF ONE CURIE PER YEAR FOR RELEASES TO SANITARY SEWER SYSTEMS IS NOT EXCEEDED. CONSIDERATION SHOULD BE GIVEN TO - VARIATIONS IN FLOW RATE AND COMPOSITION OF THE FLUID BEING MONITORED, MINIMUM SENSITIVITY OF THE MONITOR EMPLOYED, THE UNKNOWN NATURE OF POSSIBLE ACTIVITY RELEASED, THE NEED TO INCLUDE TRITIUM AND OTHER LOW-ENERGY EMITTERS. HOW IS THE NECESSARY FUNCTIONAL OR PHYSICAL REDUNDANCY PROVIDED IN THIS AUTOMATIC SYSTEM TO ENSURE ITS OPERATION WHEN REQUIRED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

REACTOR, HWR + *MONITOR, LIQUID + REACTOR, RESEARCH + REPORT, SAR + *WASTE DISPOSAL, LIQUID + RESPONSE TO NRC QUESTION

017924
QUESTION 10 - ANALYSIS OF TRITIUM DOSES FROM HEAT EXCHANGER FAILURE
NATIONAL BUREAU OF STANDARDS, REACTOR RADIATIONS DIVISION, INSTITUTE FOR MATERIALS RESEARCH
NBSR-98 + NBS-R-9464 +. 4 PAGES, 1 TABLE, PAGE 10-1 THRU 10-4 OF SUPPLEMENT B OF THE FINAL SAFETY ANALYSIS REPORT OF THE NATIONAL BUREAU OF STANDARDS REACTOR, DECEMBER 16, 1966, DOCKET NO. 50-184

ANALYZE TRITIUM DOSES RESULTING FROM A MASSIVE HEAT-EXCHANGER FAILURE WHEN THE HEAVY WATER CARRIES OVER TO THE SECONDARY COOLING TOWER. (ANSWER) A SINGLE TUBE RUPTURE WITH NO OPERATOR ACTION WILL GIVE AN OFF-SITE CONCENTRATION OF 9 MPC, REQUIRING 250 HR EXPOSURE TO OBTAIN A DOSE OF 0.2 REM.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*AIRBORNE RELEASE + *DOSE + REACTOR, HWR + REACTOR, RESEARCH + REPORT, SAR + *HAZARDS ANALYSIS + RESPONSE TO NRC QUESTION + NBS + FAILURE, TUBING + HEAT EXCHANGERS

021603
QUESTION 4.2--PRODUCTION RATE OF TRITIUM FROM ROUTINE OPERATION
PHILADELPHIA ELECTRIC COMPANY
1 PAGE OF THE PRELIMINARY SAFETY ANALYSIS REPORT, PEACH BOTTOM ATOMIC POWER STATION UNITS 2 AND 3, SUPPLEMENT NO. 1, DOCKET 50-277/278, TYPE--BWR, MFG--G.E., AE--BECHTEL, 1967

SUBMIT YOUR ANALYSIS OF THE PRODUCTION RATE OF TRITIUM RESULTING FROM ROUTINE OPERATION, AND DESCRIBE CAPABILITY TO MEASURE ITS PRESENCE IN LIQUID AND GASEOUS EFFLUENTS, AND POSSIBLE RATE OF BUILDUP IN THE PRIMARY COOLANT SYSTEM OVER AN EXTENDED TIME. ***(ANSWER) FORMATION RATE IS 0.4 CURIE PER MONTH PER UNIT IN THE COOLANT WATER, AND 1400 CURIES IN THE FUEL/MONTH/UNIT.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

ACTIVITY BUILDUP + REACTOR, BWR + FISSION PRODUCT RELEASE + MEASUREMENT + *RESPONSE TO NRC QUESTION + REPORT, PSAR + MAIN COOLING SYSTEM + PEACH BOTTOM 2 (BWR)

022680
QUESTION 4.7 - TRITIUM BUILDUP AND HAZARD
NORTHERN STATES POWER CO., MINNEAPOLIS, MINNESOTA
3 PAGES, 3 REFERENCES, PAGE 4.7-1 THRU 4.7-3 OF AMENDMENT 4 TO MONTICELLO CONSTRUCTION PERMIT APPLICATION, JAN. 10, 1967, DOCKET NO. 50-263

ANALYZE THE BUILDUP OF TRITIUM IN THE PRIMARY COOLANT OVER THE LIFE OF THE PLANT. EVALUATE THE HAZARD FROM TRITIUM INVENTORY IN THE PRIMARY COOLANT IN TERMS OF A STEAM-LINE RUPTURE. WHAT MEANS OF TRITIUM MONITORING WILL BE PROVIDED TO ENSURE THAT EXCESSIVE CONCENTRATIONS ARE NOT REACHED IN THE REACTOR COOLANT OR RADWASTE SYSTEM. (ANSWER) MAXIMUM CONCENTRATION IN REACTOR COOLANT IS 0.5 MICROCURIE/CC. EFFLUENT CONCENTRATIONS WILL BE BELOW OFF-SITE PERMISSIBLE CONCENTRATIONS BY A FACTOR OF 1 MILLION, SO NO SPECIAL MONITORS ARE NECESSARY. OFF-SITE DOSES

022680 *CONTINUED*
FOR STEAM-LINE-BREAK ACCIDENT WERE ANALYZED IN THE SAR AND ARE BELOW LIMITS, SO ANALYSIS FOR TRITIUM IS NOT NECESSARY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

ACTIVITY BUILDUP + REACTOR, BWR + EFFLUENT + *HAZARD, RELATIVE + ACCIDENT, STEAM LINE RUPTURE + *HAZARDS ANALYSIS + CONTAMINATION + MONITOR + RESPONSE TO NRC QUESTION + MONTICELLO (BWR) + REPORT, PSAR + MAIN COOLING SYSTEM

025191
RESPONSE TO QUESTION 5-1 - CURRENT TRITIUM LEVEL IN LAKE MICHIGAN
COMMONWEALTH EDISON COMPANY
1 PAGE, PAGE 5-1-1 OF AMENDMENT 7 TO ZION 1 AND 2 LICENSE APPLICATION (PSAR), APRIL 17, 1968, DOCKET NO. 50-295/304, TYPE--PWR, MFG--WEST, AE--SGT + LUNDY

WHAT IS THE TRITIUM LEVEL IN LAKE MICHIGAN. (ANSWER) LITERATURE SHOWS OCEAN LEVELS AS 4 X 10 (MINUS 16TH) CURIE/CC, AND RIVERS AS 10(MINUS 11 TO MINUS 13). WE ESTIMATE THE TRITIUM LEVEL IN LAKE MICHIGAN AS 10(MINUS 13 TO MINUS 14) CURIE/CC, AND OUR SAMPLES WILL BE ANALYZED IN A MONTH. SEE QUESTION 18-1 IN VOL. IV FOR POTENTIAL OF TRITIUM BUILDUP IN THE LAKE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VIRGINIA, 22151, $3.00 COPY, $0.65 MICROFICHE

ACTIVITY BUILDUP + OCEAN AND SEA + REACTOR, PWR + RIVER + *RESPONSE TO NRC QUESTION + REPORT, PSAR + ZION 1 (PWR) + WASTE DISPOSAL, LAKE

030494
WASTE HANDLING, VESSEL INTERNALS, AND TABULATION OF LOCATION OF RESPONSES TO AEC QUESTIONS
ROCHESTER GAS AND ELECTRIC CORP.
50 PAGES, FIGURES, TABLES, AMENDMENT 12 TO GINNA LICENSE APPLICATION (SUPPL. TO FSAR), DEC. 6, 1968, DOCKET 50-244, TYPE--PWR, MFG--WEST., AE--GILBERT ASSOC.

CONTAINS REPLACEMENT PAGES FOR FSAR AND SOME ADDITIONAL INFORMATION ON WASTE HANDLING IN GENERAL AND TRITIUM IN PARTICULAR. ALSO INCLUDES ADDITIONAL FIGURES OF THE REACTOR INTERNALS ASSEMBLY. INFORMATION IN REPLACEMENT PAGES COMPLETES RESPONSES TO AEC QUESTIONS AND PROVIDES A TABULATION OF THE LOCATION (SUPPLEMENT AND/OR FSAR) OF INFORMATION WHICH RESPONDS TO AEC QUESTIONS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

NRC QUESTION + REACTOR, PWR + REACTOR, INTERNAL SUPERHEAT + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + CORE COMPONENTS

030610
SUPPLEMENT 3 TO PSAR - ADDITIONAL INFORMATION TO AEC QUESTIONS IN SUPPLEMENT 1
NIAGARA MOHAWK POWER CORPORATION
24 PAGES, AMENDMENT 3 TO EASTON LICENSE APPLICATION (SUPPL. 3 TO PSAR), APRIL 16, 1969, DOCKET 50-300, TYPE--BWR, MFG--G.E., AE--STONE + WEBSTER

BRIEF INFORMATION CONCERNING MAXIMUM PROBABLE FLOOD, RESPONSE OF UPSTREAM DAMS, EARTHQUAKE ACCELERATION RESPONSE SPECTRA, AEC DESIGN CRITERION 35 ON BRITTLE FRACTURE OF REACTOR COOLANT PRESS. BOUNDARY, VESSEL STUB TUBES, RESIDUAL HEAT REMOVAL SYSTEM, TRITIUM, TORNADO EMERGENCY POWER, SAFETY SYSTEM, CLEANUP SYSTEM, AND SEISMIC ANALYSIS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*NRC QUESTION + REACTOR, BWR + BRITTLE FRACTURE + EMERGENCY POWER, ELECTRIC + NRC DESIGN CRITERIA + PRESSURE VESSELS + REACTOR SAFETY SYSTEM + WELDING + COOLING, SHUTDOWN + EARTHQUAKE + DESTRUCTIVE WIND + REPORT, PSAR + ACCELERATION + EARTHQUAKE ENGINEERING + RESPONSE SPECTRUM + FLOOD + EASTON (BWR) + AUXILIARY COOLING SYSTEM + PIPES AND PIPE FITTINGS + CONTROL ROD DRIVE MECHANISMS

030617
RESPONSE TO QUESTION 7 - TRITIUM CONTROLS
NIAGARA MOHAWK POWER CORPORATION
4 PAGES, 1 TABLE, PP. 18-22 OF SUPPLEMENT 3 TO EASTON PSAR, APRIL 16, 1968, DOCKET 50-300, TYPE--BWR, MFG--G.E., AE--STONE + WEBSTER

DISCUSS PRODUCTION RATES AND CONTROLS FOR TRITIUM. *** (ANSWER) FORMATION RATE BY NEUTRON BOMBARDMENT IS 3 TIMES 10(MINUS 3RD) MICROCURIE/SEC IN 1000-MWT REACTOR, 165 MICROCURIES/SEC FROM FISSION, AND 3100 MICROCURIES/SEC FROM BORON CONTROL RODS. LIQUID RELEASE IS FACTOR OF 4 BELOW MPC, GAS RELEASE FACTOR OF 5 BELOW LIMIT.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

ACTIVITY BUILDUP + REACTOR, BWR + BORON + FISSION GAS RELEASE + FISSION PRODUCT, VOLATILE + *WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RADIOACTIVITY RELEASE + RADIOLYTIC GAS + FISSION PRODUCT

030617 *CONTINUED*
RETENTION + RESPONSE TO NRC QUESTION + REPORT, PSAR + MAIN COOLING SYSTEM + EASTON (BWR) + CONTROL RODS

031698
RESPONSE TO COMMENT 2.17--TRITIUM
NEW YORK STATE ELECTRIC AND GAS CORP.
2 PAGES, AMENDMENT 1 TO BELL LICENSE APPLICATION (PSAR), DOCKET 50-319, TYPE--BWR, MFG--G.E., AE--UE+C, OCTOBER 1968

IDENTIFY SOURCES OF TRITIUM, AND RELEASE AMOUNT. DESCRIBE MEASUREMENT AND DETECTION TECHNIQUES, POTENTIAL SOURCE, PRODUCTION RATE, AMOUNT RELEASED TO COOLANT, EXPECTED CONCENTRATION IN THE DISCHARGE CANAL CONSIDERING REPLACEMENT RATE OF COOLANT, COOLANT RELEASED AS LIQUID WASTE, DESIGN OF RADWASTE SYSTEM, MODE OF RELEASE OF RADWASTE TO DISCHARGE CANAL, HOW TRITIUM CONCENTRATIONS ARE MEASURED IN EFFLUENTS, AND HEALTH AND SAFETY PROBLEMS ASSOCIATED WITH RELEASES. ***(ANSWER) SEE SIMILAR RESPONSE IN AMEND. 1 OF E.I. HATCH (DOCKET 50-321). NO MONITORING PROGRAM PLANNED. CONCENTRATION SO LOW, NO HEALTH OR SAFETY PROBLEM. COOLING TOWERS PLANNED, AND NO OTHER UNITS EXPECTED, SO PERMISSIBLE LIMITS IN LAKE WILL NOT BE EXCEEDED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

ACTIVITY BUILDUP + REACTOR, BWR + *HAZARD, RELATIVE + *RADIATION SAFETY AND CONTROL + RADIOACTIVITY RELEASE + RADIOLYTIC GAS + RADIONUCLIDE, INDUCED + RESPONSE TO NRC QUESTION + REPORT, PSAR + MAIN COOLING SYSTEM + LAKE .+ BELL (BWR)

032438
RESPONSE TO QUESTION 2 - SPECIFICATIONS FOR COOLANT ACTIVITY AND LEAKAGE
SAXTON NUCLEAR EXPERIMENTAL CORPORATION
16 PAGES, 3 TABLES, PP. 5-20 OF LETTER TO D.J. SKOVHOLT, DRL, MARCH 12, 1969, DOCKET 50-146, TYPE--PWR, MFG--WEST., AE--GILBERT ASSOC.

ANALYSIS AND SPECIFICATIONS REQUIRED FOR 7 ITEMS (MAX. ALLOWABLE FAILED FUEL, STEAM-GENERATOR LEAKAGE, ACTIVITY IN BLOWDOWN AND WATER-STORAGE TANKS, MONITORING OF ACTIVITY, RELIEF-VALVE TESTING). *** (ANSWER) (A) PRIMARY-COOLANT-GAS ACTIVITY LIMIT OF 200 MICROCURIES/CC, EQUIVALENT TO GAS FROM 10 RODS. (B,C) EXISTING LIMIT ON BLOWDOWN ACTIVITY AND HEAT-EXCHANGER LEAKAGE GIVES OFF-SITE DOSES OF MILLIREMS IN STEAM-LINE BREAKS. (D) TRITIUM LIMIT OF 0.0048 MICROCURIE/CC PROPOSED FOR STORED WATER. (E,F) CONTINUOUS MONITORING OF PRIMARY-COOLANT FISSION-PRODUCT ACTIVITY ABOVE 2/3 POWER. TANK INTEGRITY VERIFIED THRICE WEEKLY. (G) PSV RELIEF VALVE TEST YEARLY.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*ACTIVITY BUILDUP + REACTOR, PWR + SAXTON (PWR) + ACCIDENT, STEAM LINE RUPTURE + INSTRUMENT, DETECTION FAILED FUEL ELEMENT + TECHNICAL SPECIFICATIONS + REFUELING + RESPONSE TO NRC QUESTION + *MAIN COOLING SYSTEM

033201
RESPONSE TO QUESTION 14.6--PRODUCTION RATE OF TRITIUM IN PRIMARY COOLANT
BALTIMORE GAS AND ELECTRIC COMPANY
2 PAGES, 2 TABLES, PAGES 14.6-1 AND -2 OF CALVERT CLIFFS NUCLEAR POWER PLANTS LICENSE APPLICATION, UNITS 1 AND 2, DECEMBER 19, 1968, DOCKET 50-317, 318, TYPE--PWR, MFG--COMB., AE--BECHTEL

PROVIDE DATA ON PRODUCTION RATE OF TRITIUM BY TERNARY FISSION AND ACTIVATION OF COOLANT BORON AND LITHIUM. ***ANSWER ON PAGES 14.6-1 AND -2.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151, $3.00 COPY, $0.65 MICROFICHE

*ACTIVITY BUILDUP + BORON + REACTOR, PWR + *ACTIVATION PRODUCT + LITHIUM + RESPONSE TO NRC QUESTION + *MAIN COOLING SYSTEM + CALVERT CLIFFS 1 (PWR) + CALVERT CLIFFS 2 (PWR)

033717
RESPONSE TO QUESTION 12.6-A - TRITIUM GENERATION AND CONTROL
JERSEY CENTRAL POWER AND LIGHT + METROPOLITAN EDISON COMPANY
7 PAGES, 3 FIGURES, PG. 12.6-A-1 THRU -4 OF THREE MILE ISLAND 2, PSAR, VOL. 4, MARCH 10, 1969, DOCKET 50-320, TYPE--PWR, MFG--B+W, AE--BURNS + ROE

DISCUSS TRITIUM GENERATION AND CONTROL. *** (ANSWER ON PG. 12.6-A-1 THRU -4 PLUS 3 FIGURES.)

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*ACTIVITY BUILDUP + REACTOR, PWR + *WASTE DISPOSAL, GAS + WASTE MANAGEMENT + STORAGE CONTAINER + RESPONSE TO NRC QUESTION + REPORT, PSAR + THREE MILE ISLAND 2 (PWR)

034797
RESPONSE TO QUESTION 2.4B - TRITIUM AND IODINE CONCENTRATIONS FROM DBA

034797 *CONTINUED*
NEW YORK STATE ELECTRIC AND GAS COMPANY
3 PAGES, 1 TABLE, PG. 2.4B-1 THRU -3 OF AMENDMENT 3 TO BELL LICENSE APPLICATION, JANUARY 27, 1969, DOCKET 50-319, TYPE--BWR, MFG--G.E., AE--UE+C

ASSUMING ALL LIQUID RADWASTE RELEASED FOR 7 MONTHS IS CONFINED IN THE UPPER 50 FEET OF THE EPILIMNION IN THE CENTRAL PORTION OF THE LAKE, WHERE IT IS UNAFFECTED BY ANY STREAM INFLOW DURING THIS PERIOD, PROVIDE NEW ANALYSES OF THE CONCENTRATIONS OF TRITIUM, LONG LIVED ACTIVITY, OR RADIOIODINE, AS APPROPRIATE, WHICH WOULD RESULT AT VARIOUS DISTANCES FROM THE REACTOR. CONSIDER IN YOUR ANALYSIS THE SAME EFFECTS LISTED IN PART A. ABOVE AS APPROPRIATE. *** (ANSWER ON PG. 2.4B-1 THRU -3.)

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATICN, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, BWR + DOSE + FISSION PRODUCT, IODINE + RESPONSE TO NRC QUESTION + REPORT, PSAR + OFF SITE + WASTE DISPOSAL, LAKE + BELL (BWR)

034798
RESPONSE TO QUESTION 2.4C - TRITIUM AND IODINE CONCENTRATION FOR DBA
NEW YORK STATE ELECTRIC AND GAS CORPORATION
6 PAGES, PG. 2.4C-1 THRU -6 OF AMENDMENT 3 OF BELL LICENSE APPLICATION, JANUARY 27, 1969, DOCKET 50-319, TYPE--BWR, MFG--G.E., AE--UE+C

PROVIDE ANALYSES OF THE CONCENTRATIONS OF TRITIUM, LONG LIVED ACTIVITY, OR RADIOIODINE, AS APPROPRIATE, WHICH WOULD RESULT AT VARIOUS DISTANCES FROM THE REACTOR ASSUMING DBA OCCURS DURING A SLOW DRIZZLE WHICH CONTINUES FOR 24 HOURS AND PRODUCES MAXIMUM RAINOUT EFFECTS AT ALL DISTANCES. *** (ANSWER ON PG. 2.4C-1 THRU -6.)

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATIN, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, BWR + *FISSICN PRODUCT RELEASE + FISSION PRODUCT, IODINE + *RAINOUT + RESPONSE TO NRC QUESTION + REPORT, PSAR + BELL (BWR)

037151
RESPONSE TO QUESTION 11.3 - TRITIUM SAMPLING
CONSUMERS POWER COMPANY
1 PAGE, PG 11.3-1 OF AMENDMENT 14 TO PALISADES LICENSE APPLICATION, JULY 17, 1969, DOCKET 50-255, TYPE--PWR, MFG--COMB., AE--BECHTEL

AT WHICH POINTS IN THE LIQUID WASTE SYSTEM WILL TRITIUM LEVELS BE MONITORED AND HOW WILL TRITIUM CONCENTRATIONS BE DETERMINED. *** ANSWER ON PG 11.3-1.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

EFFLUENT + MONITOR, LIQUID + REACTOR, PWR + REPORT, SAR + *WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + PALISADES (PWR) + RADIATION MONITORS

037742
RESPONSE TO QUESTION 12.6-A - TRITIUM GENERATION AND CONTROL
JERSEY CENTRAL POWER AND LIGHT
1 PAGE, PG 12.6-A-1 OF AMENDMENT 5 TO OYSTER CREEK 2 LICENSE APPLICATION, DEC. 2, 1968, DOCKET 50-320, TYPE--PWR, MFG--B+W, AE--BURNS AND ROE

DISCUSS TRITIUM GENERATION AND CONTROL. *** (ANSWER) FOR THE OYSTER CREEK UNIT 2 REACTOR, THIS IS BEING ANALYZED. ANALYSIS IS NOT YET COMPLETE AND WILL BE SUBMITTED LATER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

ACTIVITY BUILDUP + REACTOR, PWR + *REACTOR COOLANT + RESPONSE TO NRC QUESTION + REPORT, PSAR + MAIN COOLING SYSTEM + THREE MILE ISLAND 2 (PWR)

038486
RESPONSE TO QUESTION 9.6 - TRITIUM RELEASE RATE
LONG ISLAND LIGHTING COMPANY, HICKSVILLE, NEW YORK
50322-8 +. 3 PAGES, 3 REFERENCES, PG A5-153 THRU -155 OF AMENDMENT 5 TO SHOREHAM 1 LICENSE APPLICATION, APRIL 18, 1969, DOCKET 50-322, TYPE--BWR, MFG--G.E., AE--STONE + WEBSTER

PROVIDE INFORMATION CONCERNING ESTIMATED TRITIUM RELEASES FROM THIS FACILITY DURING REACTOR OPERATION. *** (ANSWER) THE FOLLOWING SOURCES OF TRITIUM ARE CONSIDERED - (1) TERNARY FISSION - FUEL LEAKAGE, AND (2) ACTIVATION OF BURNABLE POISONS.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, BWR + *RELEASE RATE + *RESPONSE TO NRC QUESTION + REPORT, PSAR + SHOREHAM (BWR)

041121
RESPONSE TO QUESTION 9.5.2-1 - SOURCES OF TRITIUM PRODUCTION
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50324-8 +. 1 PAGE, PG. 9.5.2-1 OF AMENDMENT 4 TO BRUNSWICK 1 AND 2 LICENSE APPLICATION, JANUARY 31, 1969, DOCKETS 50-324/325, TYPE--BWR, MFG--G.E., AE--UE+C

IDENTIFY THE SOURCES OF TRITIUM PRODUCTION IN THE REACTOR, INCLUDING THE BASES FOR EVALUATING THE PRODUCTION RATES. DISCUSS THE UNCERTAINTIES THAT ARE ASSOCIATED WITH THE PRODUCTION RATES. *** (ANSWER) THE ENTIRE QUESTION OF TRITIUM HAS BEEN DISCUSSED IN TECHNICAL NOTES ON THE SIGNIFICANCE OF TRITIUM IN WATER REACTORS, BY JAMES M. SMITH, WHICH WAS SUBMITTED TO THE AEC AS PART OF AMENDMENT 1 TO THE E.I. HATCH NUCLEAR PLANT DOCKET 50-321.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + WASTE SOURCE AND TYPE + WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + BRUNSWICK 1 (BWR) + BRUNSWICK 2 (BWR)

041123
RESPONSE TO QUESTION 9.5.4 - FRACTION OF TRITIUM RELEASED OF PRIMARY COOLANT
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50324-8 +. 1 PAGE, PG. 9.5.4-1 OF AMENDMENT 4 TO BRUNSWICK 1 AND 2 LICENSE APPLICATION, JANUARY 31, 1969, DOCKETS 50-324/325. TYPE--BWR, MFG--G.E., AE--UE+C

WHAT FRACTION OF THE TRITIUM PRODUCED FROM EACH OF THE SOURCES IS RELEASED TO THE PRIMARY COOLANT. HOW HAVE THESE VALUES BEEN DETERMINED. WHAT ARE THE UNCERTAINTIES IN THE VALUES. *** (ANSWER) SEE RESPONSE TO COMMENT 9.5.2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVITY BUILDUP + REACTOR, BWR + RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + COOLANT QUALITY + BRUNSWICK 1 (BWR) + BRUNSWICK 2 (BWR)

041124
RESPONSE TO QUESTION 9.5.5 - TRITIUM/COOLANT/LIQUID-WASTE CHAIN
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50324-8 +. 1 PAGE, PG. 9.5.5-1 OF AMENDMENT 4 TO BRUNSWICK 1 AND 2 LICENSE APPLICATION, JANUARY 31, 1969, DOCKETS 50-324/325, TYPE--BWR, MFG--G.E., AE--UE+C

WHAT FRACTION OF THE TRITIUM RELEASED TO THE PRIMARY COOLANT IS RELEASED IN THE LIQUID WASTES. *** (ANSWER) SEE RESPONSE TO COMMENT 9.5.2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + BRUNSWICK 1 (BWR) + BRUNSWICK 2 (BWR)

041125
RESPONSE TO QUESTION 9.5.6 - EVALUATION OF TRITIUM CONCENTRATIONS IN DISCHARGE CANAL
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50324-8 +. 1 PAGE, PG. 9.5.6-1 OF AMENDMENT 4 TO BRUNSWICK 1 AND 2 LICENSE APPLICATION, JANUARY 31, 1969, DOCKETS 50-324/325, TYPE--BWR, MFG--G.E., AE--UE+C

DESCRIBE HOW THE TRITIUM CONCENTRATIONS IN THE DISCHARGE CANAL WILL BE EVALUATED FOR AVERAGE YEARLY DISCHARGES AND FOR CONDITIONS WHICH ON A SHORT TERM MIGHT LEAD TO HIGHER CONCENTRATIONS. *** (ANSWER) SEE RESPONSE TO COMMENT 9.5.2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + WASTE DISPOSAL, LIQUID + CONCENTRATION, PEAK TO AVERAGE + WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + BRUNSWICK 1 (BWR) + BRUNSWICK 2 (BWR)

041126
RESPONSE TO QUESTION 9.5.7 - TRITIUM CONCENTRATIONS - DISCHARGE CANAL VS SOURCE OF WATER
CAROLINA POWER AND LIGHT COMPANY
DOCKET-50324-8 +. 1 PAGE, PG. 9.5.7-1 OF AMENDMENT 4 TO BRUNSWICK 1 AND 2 LICENSE APPLICATON, JANUARY 31, 1969, DOCKETS 50-324/325, TYPE--BWR, MFG--G.E., AE--UE+C

HOW WILL THE TRITIUM CONCENTRATIONS IN THE DISCHARGE CANAL AND IN THE MIXED WATER SOURCE (I.E., FLOWING RIVER) COMPARE WITH THE TRITIUM ALREADY PRESENT IN THE WATER SOURCE. *** SEE RESPONSE TO COMMENT 9.5.2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + BRUNSWICK 1 (BWR) + BRUNSWICK 2 (BWR)

041335
RESPONSE TO QUESTION 11.5 - SAMPLING TRITIUM (LIQUID RADWASTE SYSTEM
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
1 PAGE, PAGE Q 11.5-1 OF AMENDMENT 12 TO INDIAN POINT 2 LICENSE APPLICATION, NOVEMBER 21, 1969, DOCKET 50-247, TYPE--PWR, MFG--WEST., AE--UNITED ENGR.

WE UNDERSTAND THAT IT IS NOT YOUR INTENT TO SAMPLE FOR TRITIUM IN THE LIQUID RADWASTE SYSTEM ON A BATCH BY BATCH BASIS PRIOR TO RELEASE FROM THIS FACILTIY. IF THIS IS SO, PROVIDE THE BASIS BY WHICH COMPLIANCE WITH THE TECHNICAL SPECIFICATIONS WILL BE DEMONSTRATED. **** ANSWER ON PAGE Q 11.5-1

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + REPORT, SAR + *SAMPLING + *WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + INDIAN POINT 2 (PWR) + RESPONSE TO NRC QUESTION

041759
RESPONSE TO QUESTION 9.2 - TRITIUM-RELEASE LIMITS
WISCONSIN ELECTRIC POWER COMPANY + WISCONSIN MICHIGAN ELECTRIC POWER COMPANY
50266-16 +. 1 PAGE, PG Q 9.2-1 OF AMENDMENT 2 TO POINT BEACH 1 AND 2 LICENSE APPLICATION, JANUARY 19, 1970, DOCKETS 50-266/301, TYPE--PWR, MFG--WEST., AE--BECHTEL

DISCUSS THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED (TABLE 9.2-6 IN FSAR). WHAT SPECIAL PRECAUTIONS WILL BE TAKEN CONCERNING TRITIUM DURING REFUELING WITH RESPECT TO PLANT PWERSONNEL AND RELEASES TO THE ENVIRONMENT. *** (ANSWER) FOR UNCERTAINTIES, SEE TABLE 9.2-6, AS AMENDED. FOR TRITIUM RELEASES TO THE ATMOSPHERE VIA THE CONTAINMENT PURGE SYSTEM, SEE THE FFDSAR, SECTION 15.3.9.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + REPORT, SAR + *WASTE DISPOSAL, GAS + *WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + POINT BEACH 1 (PWR) + AQUATIC ORGANISM + POINT BEACH 2 (PWR)

042236
RESPONSE TO QUESTION 9.4 - CONCENTRATION OF TRITIUM IN COOLING SYSTEM
VIRGINIA ELECTRIC AND POWER COMPANY
50338-11 +. 1 PAGE, PG S9.4-1 OF NORTH ANNA 1 AND 2 PSAR SUPPLEMENT, VOL. 2 OF AMENDMENT 4, JANUARY 26, 1970, DOCKETS 50-338/339, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

THE PSAR STATES, ON PG 9.1.3-1, THAT THE CHEMICAL AND VOLUME CONTROL SYSTEM WILL BE USED TO CONTROL THE CONCENTRATION OF TRITIUM IN THE REACTOR COOLANT SYSTEM. DISCUSS THE CONTROL TECHNIQUES AND CRITERIA. *** (ANSWER) THIS WILL BE DONE BY LETDOWN OF ABOUT 4 SYSTEM VOLUMES PER REFUELING CYCLE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + *RESPONSE TO NRC QUESTION + REPORT, PSAR + *MAIN COOLING SYSTEM + NORTH ANNA 1 (PWR) + NORTH ANNA 2 (PWR)

042250
RESONSE TO QUESTION 11.1A - TRITIUM RELEASES TO CANAL
VIRGINIA ELECTRIC AND POWER COMPANY
50388-11 +. 1 PAGE, PG S11.1(A)-1 OF NORTH ANNA 1 AND 2 PSAR SUPPLEMENT, VOL. 2 OF AMENDMENT 4, JANUARY 26, 1970, DOCKETS 50-338/339, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

WHAT FRACTION OF PRIMARY-COOLANT TRITIUM WILL BE RELEASED TO THE CIRCULATING-WATER DISCHARGE CANAL? *** (ANSWER) THE FRACTION IS A FUNCTION OF THE PRIMARY-GRADE WATER MANAGEMENT AT THE STATION AND CANNOT BE ASSESSED AT THIS TIME.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + *WATER + *WASTE DISPOSAL, LIQUID + *WASTE MANAGEMENT + *RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + REPORT, PSAR + NORTH ANNA 1 (PWR) + NORTH ANNA 2 (PWR)

042251
RESPONSE TO QUESTION S11.1B - TRITIUM ASSAYS - TREATMENT LAGOONS
VIRGINIA ELECTRIC AND POWER COMPANY
50388-11 +. 1 PAGE, PG S11.1(B) OF NORTH ANNA 1 AND 2 PSAR SUPPLEMENT, VOL. 2 OF AMENDMENT 4, JANUARY 26, 1970, DOCKETS 50-338/339, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

DESCRIBE HOW THE TRITIUM CONCENTRATION IN THE TREATMENT LAGOONS WILL BE EVALUATED FOR YEARLY AVERAGE CONCENTRATIONS AND FOR CONDITIONS WHICH OVER A SHORT TERM MIGHT CAUSE HIGHER CONCENTRATIONS. *** (ANSWER) WATER SAMPLES FROM THE TREATMENT LAGOONS WILL BE ROUTINELY OBTAINED AS PART OF THE ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM. RADIOANALYSIS OF THE

042251 *CONTINUED*
SAMPLES WILL INCLUDE TRITIUM ASSAYS FROM WHICH YEARLY AVERAGE CONCENTRATIONS CAN BE DETERMINED.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + *WATER + *SAMPLING + *WASTE DISPOSAL, LIQUID + *WASTE MANAGEMENT + *RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + REPORT, PSAR + *IMPOUNDMENT + NORTH ANNA 1 (PWR) + NORTH ANNA 2 (PWR)

042252
RESPONSE TO QUESTION 11.1C - TRITIUM - RECYCLING EFFECTS
VIRGINIA ELECTRIC AND POWER COMPANY
50338-11 +. 1 PAGE, PG S11.1(C)-1 OF NORTH ANNA 1 AND 2 PSAR SUPPLEMENT, VOL. 2 OF AMENDMENT 4, JANUARY 26, 1970, DOCKETS 50-338/339, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

AS TO TRITIUM, CONSIDER THE POTENTIAL RECYCLING EFFECTS DURING PERIODS OF MINIMUM RESERVOIR INFLOW AND MINIMUM OUTFLOW WHEN THE EFFLUENT DISCHARGE RATE FROM THE TREATMENT LAGOONS EXCEEDS THE INFLOW AND OUTFLOW RATE THROUGH THE NORTH ANNA RESERVOIR. *** (ANSWER) THIS QUESTION IS ANSWERED AS PART OF QUESTION 11.3.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + *WATER + *WASTE DISPOSAL, LIQUID + *WASTE MANAGEMENT + *RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + REPORT, PSAR + *IMPOUNDMENT + NORTH ANNA 1 (PWR) + NORTH ANNA 2 (PWR)

042253
RESPONSE TO QUESTION 11D - MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM STATION
VIRGINIA ELECTRIC AND POWER COMPANY
50338-11 +. 1 PAGE, PG 11.1(D)-1 OF NORTH ANNA 1 AND 2 PSAR SUPPLEMENT, VOL. 2 OF AMENDMENT 4, JANUARY 26, 1970, DOCKETS 50-338/339, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

DESCRIBE THE METHODS FOR MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM THE SATAION. *** (ANSWER) A WATER SAMPLE WILL BE OBTAINED FROM THE LOW LEVEL LIQUID WASTE TANK PRIOR TO STATION DISCHARGE. THE TRITIUM CONCENTRATION IN THIS SAMPLE WILL BE DETERMINED USING A LIQUID SCINTILLATION COUNTER.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + *WATER + *ANALYTICAL TECHNIQUE + *WASTE DISPOSAL, LIQUID + *WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + REPORT, PSAR + *IMPOUNDMENT + NORTH ANNA 1 (PWR) + NORTH ANNA 2 (PWR)

043647
RESPONSE TO QUESTION 8.5 - EMERGENCY POWER TO SAFETY FEATURES
LONG ISLAND LIGHTING COMPANY
50322-12 +. 3 PAGES, REFERENCES, PG A5-153 THRU -155 OF AMENDMENT 6 TO SHOREHAM LICENSE APPLICATION, JUNE 30, 1969, DOCKET 50-322, TYPE--BWR, MFG--G.E., AE--STONE + WEBSTER

PROVIDE THE FOLLOWING INFORMATION CONCERNING ESTIMATED TRITIUM RELEASES FROM THIS FACILITY DURING REACTOR OPERATION - (A) THE ASSUMPTIONS, CALCULATIONAL METHODS, AND BASES FOR THE TRITIUM RELEASE RATE FIGURES QUOTED IN TABLE IX-2-1. (B) THE MAXIMUM TRITIUM RELEASE RATES THAT COULD OCCUR DURING NORMAL REACTOR OPERATION, AND HOW THESE VALUES WERE DETERMINED. (C) DESCRIBE THE MEANS THAT WILL BE USED TO MONITOR THE TRITIUM LEVELS IN THE RADWASTE SYSTEMS PRIOR TO RELEASE TO THE ENVIRONMENT. *** ANSWER ON PG A5-153 THRU -155.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, BWR + *OPERATION + *RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + REPORT, PSAR + SHOREHAM (BWR)

045127
RESPONSE TO QUESTION 2.8 - SAMPLING THE DISCHARGE CANAL
NORTHERN STATE POWER COMPANY
50263-23 +. 1 PAGE, PG. 2.8-1 OF AMENDMENT 16 TO MONTICELLO LICENSE APPLICATION, AUGUST 22, 1969, DOCKET 50-263, TYPE--BWR, MFG--G.E., AE--BECHTEL

SPECIFICATION 4.6 E IN YOUR PROPOSED TECHNICAL SPECIFICATIONS STATES THAT GRAB SAMPLES WILL BE TAKEN FROM THE DISCHARGE CANAL MONTHLY AND ANALYZED FOR TRITIUM AND SIGNIFICANT ISOTOPES. EXPLAIN THE APPARENT INCONSISTENCY OF THIS WITH THE STATEMENT MADE IN SECTION 9.2.3.1. OF THE FSAR THAT THE LIQUID RADWASTE SYSTEM FOR MONTICELLO IS DESIGNED TO DISCHARGE RADIOACTIVE MATERIALS WITHIN THE LIMITS OF 10 CFR 20 WITHOUT THE ANNUAL AVERAGING PROVISION ON A BATCH-BY-BATCH BASIS. *** (ANSWER) SEE PG 2.8-1.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, BWR + *SAMPLING + *WASTE DISPOSAL, RIVER + *WASTE DISPOSAL, LIQUID + *RADIOISOTOPE + RESPONSE TO NRC QUESTION + MONTICELLO (BWR) + *TEST INTERVAL

045287
RESPONSE TO QUESTION 11.2 - LIQUID WASTES
FLORIDA POWER AND LIGHT COMPANY
50250-25 +. 1 PAGE, PG B-43 OF TURKEY POINT 2 AND 4 LICENSE APPLICATION, MAY 1, 1970, DOCKETS 50-250/251, TYPE--PWR, MFG--WEST., AE--BECHTEL

THE FSAR STATES THAT AN ISOTOPIC IDENTIFICATION OF LIQUID WASTES WILL BE MADE IF NECESSARY. INDICATE THE CRITERIA TO BE USED FOR DETERMINATION OF THE NEED FOR ISOTOPIC IDENTIFICATION. HOW WILL TRITIUM DISCHARGES BE EVALUATED AND ACCOUNTED FOR. *** (ANSWER) SEE FSAR PAGES 11.1-1 (REV.).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + REPORT, SAR + *WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + *RADIOISOTOPE + RESPONSE TO NRC QUESTION + TURKEY POINT 3 (PWR) + TURKEY POINT 4 (PWR) + *IDENTIFICATION

045390
PROJECT RIO BLANCO ENVIRONMENTAL IMPACT EVALUATION
CER GEONUCLEAR CORPORATION
PNE-RB-4 +. 336 PAGES, 103 FIGURES, 44 TABLES, 82 REFERENCES, OCTOBER 12, 1971

THE ENVIRONMENTAL IMPACT IS CONSIDERED OF AN EXPERIMENT OF THE STIMULATION OF NATURAL GAS BY A NUCLEAR DETONATION; INCLUDING LONG-TERM FLARING OF THE RADIOACTIVE GAS INTO THE ATMOSPHERE FOR TESTING PURPOSES, CONSTRUCTION, GROUND MOTION, PLANNED RADIOACTIVITY RELEASE, AND SEEPAGE OF RADIOISOTOPES FROM THE WELL. TRITIUM-CONTAMINATED WATER SEPARATED FROM THE GAS WILL EITHER BE REINJECTED NEARBY OR EVAPORATED BY INJECTION INTO GAS WHICH IS FLARED. THE HYPOTHETICAL WORST EXPOSURE FROM RADIOIODINE SEEPAGE IS ABOUT 2% OF THE RECOMMENDED YEARLY THYROID DOSE LIMIT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FALLOUT + IODINE + PLOWSHARE + SEISMOLOGY + MILK + DOSE CALCULATION, INTERNAL + GROUND WATER, NUCLIDE OCCURRENCE + HAZARDS ANALYSIS + CRITICAL NUCLIDE PATHWAY + *EXCAVATION, NUCLEAR + HYDROLOGY, RATE OF MOVEMENT + FUEL, FOSSIL + RADIONUCLIDE UPTAKE + BIOACCUMULATION/TURNOVER + *RADIONUCLIDE TRANSFER + STIMULATION + RESOURCE, NATURAL + BENEFIT VS RISK + *REPORT, ENVIRONMENTAL

045649
RESPONSE TO QUESTION 3.9 - DURABILITY OF CONTROL-ROD POISON BLADE
NORTHERN STATES POWER COMPANY
DOCKET-50263-24 +. 1 PAGE, PG 3.9-1 OF AMENDMENT 17 TO MONTICELLO LICENSE APPLICATION, SEPTEMBER 12, 1969, DOCKET 50-263, TYPE--BWR, MFG--G.E., AE--BECHTEL

DESCRIBE THE LENGTH OF TIME THE POISON CONTROL BLADES ARE EXPECTED TO REMAIN IN SERVICE, AND THE BASES FOR ESTABLISHING A REPLACEMENT SCHEDULE FOR THESE CONTROL BLADES. ALSO, DISCUSS THE MANNER IN WHICH PROPERTY CHANGES OF MATERIALS AND THE BUILDUP OF ACTIVATION PRODUCTS, SUCH AS TRITIUM, ARE CONSIDERED IN ARRIVING AT A USEFUL LIFETIME OF THE POISON CONTROL BLADES. *** (ANSWER) THE AVERAGE CONTROL-ROD LIFETIME IS ESTIMATED TO BE ABOUT 15 YEARS. WHEN EVALUATING REPLACEMENT DURING OPERATION, THE MATERIAL PROPERTIES, INTERNAL GAS PRESSURE AND BORON DEPLETION ARE BASED ON MEASURED CORE FLUXES, AND CORRESPONDENT INTEGRATED FLUX FOR INDIVIDUAL CONTROL RODS.

DESCRIBE THE LENGTH OF TIME THE POISON CONTROL BLADES ARE EXPECTED TO REMAIN IN SERVICE, AND THE BASES FOR ESTABLISHING A REPLACEMENT SCHEDULE F

REACTOR, BWR + PRESSURE, INTERNAL + RESPONSE TO NRC QUESTION + MONTICELLO (BWR) + *POISON, FIXED + *DURATION, LONG + CONTROL RODS

045877
RESPONSE TO QUESTION 11.1 - ESTIMATE OF DAILY AND ANNUAL RELEASES OF RADIOACTIVITY
CONSUMERS POWER COMPANY
DOCKET-50329-8 +. 3 PAGES, PGS 11.1-1 THRU -4 OF AMENDMENT 6 TO MIDLAND 1 AND 2 LICENSE APPLICATION, DECEMBER 29, 1969, DOCKETS 50-329/330, TYPE--PWR, MFG--B+W, AE--BECHTEL

PROVIDE AN ESTIMATE OF THE AMOUNTS OF RADIOACTIVITY ON AN ISOTOPIC BASIS (INCLUDING TRITIUM) THAT WOULD BE RELEASED DAILY AND ANNUALLY FROM THE PROPOSED MIDLAND FACILITIES. CONSIDER BOTH LIQUID AND GASEOUS WASTES, ASSUMING THAT THE ACTIVITY OF THE PRIMARY COOLANT IS THAT CORRESPONDING TO OPERATION WITH 1 PERCENT FAILED FUEL. *** ANSWER ON PAGE 11.1-1 THRU -4.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DILUTION + REACTOR, PWR + REGULATION, AEC + WASTE DISPOSAL, GAS + WASTE DISPOSAL, LIQUID + POPULATION EXPOSURE + *WASTE MANAGEMENT + *RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + MIDLAND 1 (PWR) + MIDLAND 2 (PWR)

045919
RESPONSE TO QUESTION 2.7 - SECONDARY COOLANT AND COOLING POND
CONSUMERS POWER COMPANY
50329-7 +. 3 PAGES, PG 2.7-1 THRU -3 OF MIDLAND 1 AND 2 PSAR, NOVEMBER 7, 1969, DOCKETS 50-329/330, TYPE--PWR, MFG--B+W, AE--BECHTEL

045919 *CONTINUED*
BASED UPON THE INDICATED PRIMARY-TO-SECONDARY COOLANT LEAK RATE LIMIT OF 1 GPM AND ASSUMING A PRIMARY COOLANT ACTIVITY LEVEL BASED UPON OPERATION WITH 1 PERCENT FAILED FUEL, PROVIDE THE EQUILIBRIUM SECONDARY COOLANT AND COOLING POND ACTIVITY ON AN ISOTOPIC BASIS (INCLUDING TRITIUM) DUE TO LIQUID WASTE DISCHARGE TO THE POND. *** ANSWER ON PG 2.7-1 THRU -3.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + LEAK + COOLING POND + MIDLAND 1 (PWR) + MIDLAND 2 (PWR)

046027
RESPONSE TO QUESTION 11.1 - ESTIMATED AMOUNTS OF RADIONUCLIDES RELEASED DAILY AND ANNUALLY
CONSUMERS POWER COMPANY
50329-7 +. 3 PAGES, PG 11.1-1 THRU -3 OF MIDLAND 1 AND 2 PSAR, NOVEMBER 7, 1969, DOCKETS 50-329/330, TYPE--PWR, MFG--B+W, AE--BECHTEL

PROVIDE AN ESTIMATE OF THE AMOUNTS OF RADIOACTIVITY ON AN ISOTOPIC BASIS (INCLUDING TRITIUM) THAT WOULD BE RELEASED DAILY AND ANNUALLY FROM THE PROPOSED MIDLAND FACILITIES. *** ANSWER ON PAGE 11.1-1 THRU -3.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

DILUTION + REACTOR, PWR + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + *WASTE MANAGEMENT + RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + MIDLAND 1 (PWR) + MIDLAND 2 (PWR)

046185
RESPONSE TO QUESTION 11.3 - RADIOACTIVITY DISCHARGED TO RIVER - ACCOUNTABILITY
DUQUESNE LIGHT COMPANY
50334-7 +. 1 PAGE, SEC. 9, PG 3 OF BEAVER VALLEY 1 PSAR VOL. 4, SEPTEMBER 3 1969, DOCKET 50-334, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

DESCRIBE THE PROCEDURE FOR ACCOUNTING FOR THE ACTIVITY WHICH IS DISCHARGED AS WASTE TO THE RIVER. *** (ANSWER) SEE SECTION 11.2.4, AMENDMENT 4, BVPS PSAR.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + *WASTE DISPOSAL, RIVER + *WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + BEAVER VALLEY 1 (PWR)

046276
RESPONSE TO QUESTION 11.4 - TRITIUM
PORTLAND GENERAL ELECTRIC COMPANY
DOCKET 50344-9 + 1 PAGE, PG D-128 OF AMENDMENT 6 TO TROJAN PSAR, APRIL 29, 1970, DOCKET 50-344, TYPE--PWR, MFG--WEST., AE--BECHTEL

DISCUSS THE UNCERTAINTIES ASSOCIATED WITH THE AMOUNTS OF TRITIUM GENERATED. PROVIDE YOUR ANALYSIS OF THE FRACTION OF PRIMARY-COOLANT TRITIUM THAT WILL BE RELEASED TO THE CIRCULATING-WATER DISCHARGE CANAL. DESCRIBE THE METHODS FOR MONITORING TRITIUM CONCENTRATIONS BEFORE DISCHARGE FROM THE PLANT. *** ANSWER ON PAGE D-128.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

*MONITOR, LIQUID + REACTOR, PWR + *WASTE DISPOSAL, LIQUID + RESPONSE TO NRC QUESTION + REPORT, PSAR + *MAIN COOLING SYSTEM + TROJAN (PWR)

046573
RESPONSE TO QUESTION 11.2 - TRITIUM AND OTHER RADIOACTIVITY IN LIQUID WASTE
FLORIDA POWER AND LIGHT COMPANY
1 PAGE, PG. 8-43 OF SUPPLEMENT 20 TO TURKEY POINT 3 AND 4 LICENSE APPLICATION, JUNE 26, 1970, DOCKETS 50-250/251, TYPE--PWR, MFG--WEST., AE--BECHTEL

INDICATE NEED FOR ISOTOPIC IDENTIFICATION OF LIQUID WASTES. HOW WILL TRITIUM DISCHARGES BE EVALUATED. *** REFER TO FSAR PAGES 11.1-1 (REV.).

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

REACTOR, PWR + *FISSION PRODUCT TRANSPORT + *WASTE TREATMENT, LIQUID + WASTE SOURCE AND TYPE + RESPONSE TO NRC QUESTION + TURKEY POINT 3 (PWR) + TURKEY POINT 4 (PWR)

046591
RESPONSE TO QUESTION IE - IDENTIFYING RADIOISOTOPES IN LIQUID EFFLUENTS
CAROLINA POWER AND LIGHT COMPANY

046591 *CONTINUED*
DOCKET 50261+. 1 PAGE, PG. IE OF AMENDMNET 4 TO ROBINSON 2 LICENSE APPLICATION, DECEMBER 2, 1969, TYPE--PWR, MFG--WEST., AE--EBASCO

SECTION 41 OF THE PSAR STATES THAT AN ISOTOPIC IDENTIFICATION OF LIQUID WASTES WILL BE MADE IF NECESSARY. STATE YOUR CRITERIA FOR DETERMINING WHETHER AN ISOTOPIC ANALYSIS OF WASTE EFFLUENTS SHOULD BE MADE. INCLUDE YOUR PLANS FOR MONITORING THE RELEASE OF TRITIUM AND THOSE RADIONUCLIDES CONSIDERED TO BE CRITICAL IN THE FOOD CHAIN PATHWAY TO MAN. *** ANSWER ON PAGE IE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + REPORT, SAR + MONITOR, ENVIRONMENTAL + *WASTE DISPOSAL, LIQUID + *RADIOISOTOPE + RESPONSE TO NRC QUESTION + ROBINSON 2 (PWR) + FOOD CHAIN + *IDENTIFICATION

046924
RESPONSE TO QUESTION 11.1 - DISPOSAL OF RADWASTE, GASEOUS AND LIQUID
TOLEDO EDISON COMPANY
50346-7 +. 12 PAGES, 5 TABLES, PG 11.1-1 THRU -12 OF DAVIS-BESSE PSAR, APRIL 26, 1970, DOCKET 50-346, TYPE--PWR, MFG--B+W, AE--BECHTEL

ESTIMATE THE AMOUNT OF RADIOACTIVITY ON AN ISOTOPIC BASIS (INCLUDING TRITIUM) THAT WOULD BE RELEASED DAILY AND ANNUALLY FROM THE PROPOSED FACILITIES. CONSIDER BOTH LIQUID AND GASEOUS WASTES, ASSUMING THAT THE ACTIVITY OF THE PRIMARY COOLANT IS THAT CORRESPONDING TO OPERATION WITH AN ACTIVITY LEVEL TO BE STATED IN THE TECHNICAL SPECIFICATIONS. *** ANSWER ON PG 11.1-1 THRU - 12.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

DILUTION + REACTOR, PWR + STACK + AIR + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + REPORT, PSAR

047723
RESPONSE TO QUESTION 9.4 - TRITIUM IN MAIN COOLING SYSTEM - HAZARD TO WORKERS
TENNESSEE VALLEY AUTHORITY
DOCKET 50327-7 +. 1 PAGE, PG. Q 9.4-1 OF AMENDMENT 4 TO SEQUOYAH 1 AND 2 LICENSE APPLICATION, SEPTEMBER 4, 1969, TYPE--PWR, MFG--WEST., AE--TVA

ON PAGE 9.2-32, IT IS STATED THAT TRITIUM CONCENTRATION IN THE REACTOR COOLANT WILL BE MAINTAINED AT A LEVEL WHICH PRECLUDES PERSONNEL HAZARD DURING ACCESS TO THE CONTAINMENT. INDICATE WHAT CRITERIA AND PROCEDURES WILL BE USED TO ESTABLISH AND VERIFY AN ACCEPTABLE CONCENTRATION LEVEL. *** ANSWER - BEFORE ENTERING CONTAINMENT, AIRBORNE AND GASEOUS ACTIVITY WILL BE REDUCED TO CONCENTRATIONS CONSISTENT WITH APPLICABLE VALUES IN 10CFR20.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + *PERSONNEL EXPOSURE, RADIATION + RESPONSE TO NRC QUESTION + *MAIN COOLING SYSTEM + SEQUOYAH 1 (PWR) + SEQUOYAH 2 (PWR)

049311
RESPONSE TO AEC QUESTION 11.1 - ESTIMATE (ISOTOPIC BASIS) OF DAILY AND ANNUAL RELEASE OF RADIOACTIVE MATERIAL
TOLEDO EDISON COMPANY
50346-11 +. 1 PAGES, PG. 11.1-1 OF AMENDMENT 7 TO DAVIS-BESSE LICENSE APPLICATION , JUNE 29, 1970, DOCKET 50-346, TYPE--BWR, MFG--B+W, AE--BECHTEL

PROVIDE AN ESTIMATE OF THE AMOUNTS OF RADIOACTIVITY ON AN ISOTOPIC BASIS (INCLUDING TRITIUM) THAT WOULD BE RELEASED DAILY AND ANNUALLY FROM THE PROPOSED DAVIS-BESSE FACILITIES. CONSIDER BOTH LIQUID AND GASEOUS WASTES, ASSUMING THAT THE ACTIVITY OF THE PRIMARY COOLANT IS THAT CORRESPONDING TO OPERATION WITH AN ACTIVITY LEVEL TO BE STATED IN THE TECHNICAL SPECIFICATIONS. LIST ALL ASSUMPTIONS MADE AND EXPLAIN THEIR BASES. INDICATE HOW A LOAD-FOLLOWING MODE OF OPERATION WILL AFFECT RELEASES. BASED UPON THE ESTIMATED AVAILABLE ANNUAL AVERAGE DILUTION FACTOR, PROVIDE AN ESTIMATE OF THE MAXIMUM GASEOUS RELEASE LIMIT FOR THIS FACILITY WHICH WOULD BE WITHIN THE LIMITS OF 10 CFR 20. COMPARE THIS ESTIMATED RELEASE LIMIT WITH THE ESTIMATED GASEOUS RELEASES FROM THIS FACILITY. *** ANSWER ON PAGE 11.1-1 THRU -4, PLUS TWO TABLES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 $3.00 COPY, $0.65 MICROFICHE

FISSION PRODUCT RELEASE + REACTOR, PWR + REGULATION, AEC + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + WASTE MANAGEMENT + RESPONSE TO NRC QUESTION

049779
RESPONSE TO QUESTION 2.6.4 - HYDROGEN AND TRITIUM IN AIR EJECTOR EXHAUST
COMMONWEALTH EDISON COMPANY + IOWA-ILLINOIS GAS AND ELECTRIC COMPANY
DOCKET-50254-16 +. 1 PAGE, PG. 9-2 OF QUAD CITIES 1 AND 2 LICENSE APPLICATION, JUNE 11, 1970, DOCKETS 50-254/265, TYPE--BWR, MFG--G.E., AE--SGT + LUNDY

PROVIDE THE ASSUMPTIONS USED TO CALCULATE THE AMOUNTS OF HYDROGEN GAS ANS TRITIUM IN THE AIR-EJECTOR EXHAUST. *** (ANSWER) THIS QUESTION IS ANSWERED IN SECTION 9.2.3 OF THE FSAR.

049779 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + *HYDROGEN + *WASTE DISPOSAL, GAS + *OFF GAS + RESPONSE TO NRC QUESTION + QUAD CITIES 1 (BWR) + QUAD CITIES 2 (BWR)

055527
RESPONSE TO QUESTION 11.5 - TRITIUM PRODUCTION
JERSEY CENTRAL POWER AND LIGHT COMPANY
DOCKET-50363-14 +. 2 PAGES, 11.5-1 THRU -2 OF AMENDMENT 9 TO FORKED RIVER 1 LICENSE APPLICATION, APRIL 1, 1971, DOCKET 50-363, TYPE--PWR, MFG--COMB., AE--BURNS + ROE

PRESENTS INFORMATION ON THE AVERAGE DAILY PRODUCTION RATE FOR TRITIUM IN THE REACTOR COOLANT. ALSO GIVEN ARE THE ASSUMED CONCENTRATIONS OF THE PARENT ELEMENT FOR THE REACTION PRODUCING TRITIUM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVITY BUILDUP + FUEL BURNUP + REACTOR, PWR + *RESPONSE TO NRC QUESTION + FORKED RIVER 1 (PWR)

055709
RESPONSE TO QUESTION 9.3 - TRITIUM
TENNESSEE VALLEY AUTHORITY
DOCKET-50259-30 +. 3 PAGES, PGS. Q9.3-1 THRU Q9.3-3/Q9.3-4 OF AMENDMENT 15 TO BROWNS FERRY 1-2-3 LICENSE APPLICATION, NOVEMBER 5, 1971, DOCKETS 50-259/260/296, TYPE--BWR, MFG--G.E., AE--TVA

DISCUSSES THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNT OF TRITIUM GENERATED AND THE METHOD OF MONITORING THE PLANT DISCHARGE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + *RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + BROWNS FERRY 2 (BWR) + BROWNS FERRY 3 (BWR) + *PRODUCTION + BROWNS FERRY 1 (BWR)

055883
RESPONSE TO QUESTION 9.7 - TRITIUM
PHILADELPHIA ELECTRIC COMPANY
DOCKET-50352/353-12 +. 2 PAGES, PG. 20 THRU 21 OF SUPPLEMENT 5 TO LIMERICK 1 AND 2 LICENSE APPLICATION, MAY 3, 1971, DOCKETS 50-352/353, TYPE--BWR, MFG--G.E., AE--BECHTEL

DISCUSSES THE MECHANISMS, MODES, QUANTITIES, AND RATES FOR THE CARRYOVER OF TRITIATED WATER AND TRITIUM FROM THE REACTOR VESSEL TO THE CONDENSER, AND THE CONCENTRATION EXPECTED AND HOW CONTROL AND DISPOSAL IS ACCOMPLISHED TO ASSURE OPERATION WITH RADIOACTIVITY LEVELS AS LOW AS PRACTICABLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*COOLANT CHEMISTRY + RESPONSE TO NRC QUESTION + LIMERICK 2 (BWR) + LIMERICK 1 (BWR)

056228
RESPONSE TO QUESTION 2.11 - TRITIUM GENERATION RATE AND PROTECTION OF PERSONNEL
FLORIDA POWER AND LIGHT COMPANY
DOCKET-50335-8 +. 150 PAGES, FIGURES, TABLES, REFERENCES, AMENDMENT 3 TO HUTCHINSON ISLAND 1 LICENSE APPLICATION, SEPTEMBER 8, 1969, DOCKET 50-335, TYPE--PWR, MFG--COMB., AE--EBASCO

DISCUSS THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED DURING PLANT OPERATION. WHAT SPECIAL PRECAUTIONS WILL BE TAKEN CONCERNING TRITIUM DURING REFUELING WITH RESPECT TO PLANT PERSONNEL AND RELEASES TO THE ENVIRONMENT?** (ANSWER) PRODUCTION OF TRITIUM BY FISSION HAS AN ACCURACY OF +12%. ALL OTHER SOURCES HAVE AN ACCURACY OF +-25%.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*PERSONNEL EXPOSURE, RADIATION + REFUELING + MAIN COOLING SYSTEM + SAFETY ANALYSIS + *PRODUCTION, RATE + CONTROL RODS + FUEL ELEMENTS

056406
RUNION TC
SPEECH BY T. C. RUNION, PRES., NUCLEAR FUEL SERVICES
NUCLEAR FUEL SERVICES, INC., MARYLAND
46 PAGES, FIGURES, TABLES, STATEMENT BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY, PART II, HEARINGS ON THE ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER, FEBRUARY 25, 1970

THIS SPEECH IS RECORDED ON 39 PAGES AND CONSISTS OF A DETAILED ANALYSIS OF NUS OPERATIONS TO DATE, WITH PREDICTIONS OF FUTURE PRODUCTION (REPROCESSING) VALUES AND ANTICIPATED EXPANSION. CONCERNING OPERATIONS, THE SPEAKER DISCUSSES AEC LICENSING OF CHEMICAL OPERATORS, AND SAFETY AND OPERATING PROCEDURES. COMPOSITION OF TYPICAL BWR AND PWR SPENT FUELS IS GIVEN, I.E., URANIUM, PLUTONIUM, AND MAJOR FISSION PRODUCTS. HE DETAILS PROCESSING OPERATION AND ESP. STORAGE AND DISPOSAL METHODS FOR RADIOACTIVE WASTES. OTHER TOPICS COVERED ARE -- REGULATORY REQUIREMENTS AND

056406 *CONTINUED*
CONTROLS, CONTROL OF EFFLUENTS (LIQUID WASTE CONTROL, GASEOUS WASTE CONTROL), ENVIRONMENTAL MONITORING PROGRAM, N.Y. STATE DEPT. OF HEALTH PROGRAM. EIGHT CHARTS ARE GIVEN TO SHOW RESULTS OF ENVIRONMENTAL MONITORING. ROLES OF AEC DIV. OF COMPLIANCE ENVIRONMENTAL MEASUREMENTS AND U.S. PUBLIC HEALTH SERVICE ARE PRESENTED.

IODINE + SITING, CHEMICAL PROCESS PLANT + STRONTIUM + WASTE DISPOSAL + MILK + REGULATION, AEC + *WASTE MANAGEMENT + RADIOACTIVITY RELEASE + *RADIOCHEMICAL PLANT SAFETY + *FUEL REPROCESSING + AGENCY, STATE + ENVIRONMENTAL CONTROL MEASURE + NUS + INDUSTRY, NUCLEAR + AGENCY, FEDERAL

056460
WEEKLY ROUNDUP OF AEC LICENSING MATERIAL - ALLIED-GULF NUCLEAR SERVICES
3 PAGES, ATOMIC ENERGY CLEARINGHOUSE, NO. 41, PG 13-15 (OCTOBER 12, 1970)

CAROLINA ENVIRONMENTAL STUDY GROUP ADVISES IT WISHES TO BECOME INTERVENOR AGAINST BARNWELL, S.C. REPROCESSING PLANT. THE DEPT. OF INTERIOR COMMENTED ON THE ENVIRONMENTAL REPORT SUBMITTED BY THE COMPANY. IT NOTES DEFICIENCIES IN THE FOLLOWING AREAS COVERED IN THE DRAFT - LICENSING AGENCIES, THERMAL CONSIDERATION, THERMAL ECOLOGY, TRITIUM RELEASES, AND RECREATIONAL CONSIDERATIONS, AND IT STIPULATES WHERE COMPANY SHOULD GENERATE FURTHER INFORMATION.

ECOLOGY + SITING, CHEMICAL PROCESS PLANT + FUEL REPROCESSING + THERMAL POLLUTION + AGENCY, STATE + *INDUSTRY, NUCLEAR + BENEFICIAL USE, RECREATIONAL + *AGENCY, FEDERAL + *ORGANIZATION, CITIZEN

056477
LANDIS JW
SPEECH BY J. W. LANDIS, GULF GENERAL ATOMIC
GULF GENERAL ATOMIC INCORPORATED, CALIFORNIA
14 PAGES, TESTIMONY BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY HEARINGS ON ENVIRONMENTAL EFFECTS OF PRODUCING ELECTRIC POWER, FEBRUARY 25, 1970

SPEAKER NOTES CONCERN OF PUBLIC AND OF GULF GENERAL OVER MATTERS PERTAINING TO ENVIRONMENT AND EFFORTS OF GULF OIL CORP. TO SOLVE POLLUTION PROBLEMS. HE EXPRESSES FUTURE OF N-POWER TO SOLVE POWER NEEDS AND MINIMIZE ENVIRONMENTAL INDIGNITIES. THE COMPANYS WORK ON HTGR IS REVIEWED, HOW IT IS LEAST POLLUTER (COMPARED WITH OTHER N-POWER REACTOR TYPES). HE DISCUSSES METHODS DEVELOPED TO PREVENT DISCHARGE OF KRYPTON, TRITIUM, AND PARTICLES. HTGR HAS THERMAL EFFICIENCY (THEREFORE LOW THERMAL EFFECTS) MATCHING THAT OF MODERN CONVENTIONAL PLANTS. HE NOTES GULFS PROGRESS IN FUSION RESEARCH -- THEIR PLAN TO DEMONSTRATE FEASIBILITY OF THERMONUCLEAR POWER BY 1975 AND HAVE PROTOTYPE FUSION REACTOR BY 1985. OTHER RESEARCHES CONCERN ANTIPOLLUTION EFFORTS IN THEIR PROCESS INDUSTRY, DEVELOPMENT OF SUPERCONDUCTIVE ELECTRIC TRANSMISSION LINES, AND ZINC-AIR BATTERIES TO REPLACE GASOLINE AND DIESEL ENGINES.

FISSION PRODUCT RELEASE + KRYPTON + PEACH BOTTOM 1 (HTGR) + *INDUSTRY, MANUFACTURING + REACTOR, POWER + DESALTING + *ENVIRONMENTAL CONTROL MEASURE + POLLUTION + JCAE + INDUSTRY, NUCLEAR + BENEFICIAL USE, AGRICULTURE + BENEFICIAL USE, COMMERCIAL + BENEFICIAL USE, SPACE HEATING + WASTE HEAT, WATER + POWER TRANSMISSION + PROPONENT + SOCIO/PHILOSOPHICAL CONSIDERATION + *SPOKESMAN, INDUSTRY + N-POWER FORECAST

057139
RESPONSE TO QUESTION 9.3 - TRITIUM - ESTIMATED RATE OF PRODUCTION
PHILADELPHIA ELECTRIC COMPANY
DOCKET 50352-7 +. 2 PAGES, PG. 75-76 OF SUPPLEMENT 1 TO LIMERICK-1 AND -2 LICENSE APPLICATION, OCTOBER 6, 1970, TYPE--BWR, MFG--G.E., AE--BECHTEL

PROVIDE ADDITIONAL INFORMATION TO SUPPORT YOUR STATEMENT IN SECTION 9.2.5 THAT THE MAXIMUM AMOUNT OF TRITIUM ESCAPING THE FUEL AND DIRECTLY FORMED IN THE WATER OF EACH REACTOR IS ESTIMATED TO BE 5.9 MICROCURIES/SEC BASED ON OPERATING EXPERIENCE. *** ANSWER ON PAGE 75-76.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + *WASTE MANAGEMENT + *RESPONSE TO NRC QUESTION + *RATE + *LIMERICK 2 (BWR) + *LIMERICK 1 (BWR) + *PRODUCTION, GROSS

057709
RESPONSE TO QUESTION 11.4 - TRITIUM - GENERATION, RELEASE, MONITORING
PORTLAND GENERAL ELECTRIC COMPANY
DOCKET-50344-8 +. 1 PAGE, PG D-128 OF AMENDMENT 5 TO TROJAN LICENSE APPLICATION, FEBRUARY 19, 1970, DOCKET 50-344, TYPE--PWR, MFG--WEST., AE--BECHTEL

DISCUSS THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED. ANALYZE THE FRACTION OF PRIMARY COOLANT TRITIUM THAT WILL BE RELEASED TO THE CIRCULATING WATER DISCHARGE CANAL. DESCRIBE THE METHODS TO BE EMPLOYED FOR MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM THE PLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + *WASTE DISPOSAL, LIQUID + *MONITOR + *RESPONSE TO NRC QUESTION + *REPORT, PSAR + *MAIN COOLING SYSTEM + *TROJAN (PWR) + *DISCHARGE

057868
RESPONSE TO QUESTION 10.3 - TRITIUM PRODUCED AND RELEASED
THE DETROIT EDISON COMPANY
DOCKET 50341-9 +. 2 PAGES, PG. 10.3-1 AND -2 OF AMENDMENT 3 TO FERMI-2 LICENSE APPLICATION, MAY 11, 1970, TYPE--BWR, MFG--G.E., AE--SGT + LUNDY

PROVIDE CALCULATIONS OF THE ANTICIPATED TRITIUM PRODUCTION AND DISCHARGE FROM THE PLANT. STATE TOTAL CURIES RELEASED PER YEAR, AND THE TRITIUM CONCENTRATIONS AND TOTAL ACTIVITY PER BATCH. *** ANSWER ON PAGE 10.3-1.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + MPC + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + POPULATION EXPOSURE + *RESPONSE TO NRC QUESTION + *FERMI 2 (BWR)

058116
RESPONSE TO QUESTION 1.8-151B - MANAGEMENT OF TRITIUM
SOUTHERN CALIFORNIA EDISON COMPANY
DOCKET 50361-10 +. 1 PAGE, PG. 1.8.151B OF AMENDMENT 2 TO SAN ONOFRE 2 AND 3 LICENSE APPLICATION, SEPTEMBER 16, 1970, TYPE--PWR, MFG--C.E., AE--BECHTEL

PROPOSED PLANS FOR TRITIUM MANAGEMENT. *** ANSWER - TRITIUM PRODUCTION AND ASSOCIATED PRECAUTIONS TO BE TAKEN ARE DISCUSSED IN SUBSECTION 11.6.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + *WASTE DISPOSAL, LIQUID + *WASTE MANAGEMENT + *RESPONSE TO NRC QUESTION + *SAN ONOFRE 2 (PWR) + *SAN ONOFRE 3 (PWR)

058307
RESPONSE TO QUESTION 11.2 - ANNUAL RELEASES OF LIQUID WASTES (ESTIMATED)
VIRGINIA ELECTRIC AND POWER COMPANY
DOCKET-50280-31 +. 2 PAGES, PG S11. 2-1 AND -2 OF SURRY FINAL SAFETY ANALYSIS REPORT, DECEMBER 1, 1970, DOCKET 50-280, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

ESTIMATE THE ANTICIPATED ANNUAL RELEASES FROM THE FACILITY. ASSUME A PLANT OPERATING CYCLE BASED UPON THE MAXIMUM ANTICIPATED DEGREE OF LOAD-FOLLOWING, AND THE GREATEST EXPECTED NUMBER OF FUEL DEFECTS AND AMOUNT OF TRAMP URANIUM. *** (ANSWER) ESTIMATED ANNUAL LIQUID EFFLUENT RELEASES ARE PRESENTED IN SECTION 11A.1 OF THE FSAR. TABLES 11A-7 AND 11A-10 LIST THE ACTIVITY AND ANNUAL DISCHARGE RATE OF LIQUID EFFLUENT FROM THE WASTE DISPOSAL SYSTEM WITHOUT AND WITH STEAM GENERATOR LEAKAGE, RESPECTIVELY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FISSION PRODUCT RELEASE + REACTOR, PWR + URANIUM + REGULATION, AEC + *WASTE DISPOSAL, LIQUID + *WASTE MANAGEMENT + RESPONSE TO NRC QUESTION + SURRY 1 (PWR) + SURRY 2 (PWR)

058311
RESPONSE TO QUESTION 11.6 - TRITIUM PRODUCTION
VIRGINIA ELECTRIC AND POWER COMPANY
DOCKET-50280-31 +. 1 PAGE, PG S11.6-1 OF SURRY FINAL SAFETY ANALYSIS REPORT, DECEMBER 1, 1970, DOCKET 50-280, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

ANALYZE THE PRODUCTION RATE, DISTRIBUTION, AND DISCHARGE OF TRITIUM FROM THE PLANT. DISCUSS THE METHODS THAT WILL BE USED TO EVALUATE AND ACCOUNT FOR THE TRITIUM CONTAINED IN EFFLUENTS FROM THE PLANT. *** (ANSWER) AN ANALYSIS OF THE PRODUCTION OF TRITIUM IN THE REACTOR COOLANT IS PRESENTED IN FSAR TABLE 9.1-7. TABLE 11A-8 OF THE FSAR SHOWS THAT EVEN IF ALL THE TRITIUM PRODUCED IN THE REACTOR COOLANT IS DISCHARGED FROM THE PLANT, THE CONCENTRATION OF TRITIUM IN THE DISCHARGE CANAL WOULD BE 4.8 X 10 (-6TH) UCI/CC (LESS THAN 0.2 PERCENT OF THAT ALLOWED BY 10 CFR 20).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + *REGULATION, AEC + *POPULATION EXPOSURE + RESPONSE TO NRC QUESTION + SURRY 1 (PWR) + SURRY 2 (PWR) + *PRODUCTION

058655
RESPONSE TO QUESTION 9.2 - ADEQUACY OF SYSTEM FOR TREATING LIQUID RADWASTE
COMMONWEALTH EDISON COMPANY
DOCKET-50254-22 +. 6 PAGES, 1 TABLE, PG 9.2-1 THRU -6 OF AMENDMENT 13 TO QUAD CITIES 1-2 LICENSE APPLICATION, NOVEMBER 6, 1970, DOCKETS 50-254/265, TYPE--BWR, MFG--G.E., AE--SGT + LUNDY

TO FULLY EVALUATE THE ADEQUACY OF THE LIQUID RADWASTE TREATMENT SYSTEM, THE FOLLOWING DATA AND DISCUSSION ARE NEEDED - (A) DESCRIBE FULLY THE CONTROLS WHICH ARE BUILT INTO THE SYSTEM IN ORDER TO PREVENT ACCIDENTAL RELEASE OF LIQUID EFFLUENTS. (B) INDICATE THE SAMPLE LOCATIONS AND DESCRIBE THE MEASUREMENTS THAT WILL BE TAKEN TO DETERMINE THAT THE PERMISSIBLE LIQUID EFFLUENT LIMITS SET FORTH IN 10 CFR 20 ARE NOT EXCEEDED. (C) TABULATE THE NORMAL AND MAXIMUM CONCENTRATIONS OF THE PRINCIPAL RADIOACTIVITY AND THE QUANTITIES OF WASTE AT THE INFLUENT AND

058655 *CONTINUED*
EFFLUENT POINTS OF MAJOR COMPONENTS OF THE LIQUID RADWASTE SYSTEM. *** ANSWER ON PG 9.2.2 THRU -6.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + MPC + *MONITOR, LIQUID + *WASTE TREATMENT, LIQUID + *SAMPLING + POPULATION EXPOSURE + *SYSTEM DESCRIPTION + *RESPONSE TO NRC QUESTION + *QUAD CITIES 1 (BWR) + *SYSTEM CAPABILITY + *QUAD CITIES 2 (BWR) + *CONCENTRATION

058943
RESPONSE TO QUESTION 9.10 - FAILURE OF SYSTEM TO PURIFY HELIUM
PUBLIC SERVICE COMPANY OF COLORADO
DOCKET-50267-24 +. 4 PAGES, 1 FIGURE, PG 9.10-1 THRU -4 OF AMENDMENT 17 TO FT. ST. VRAIN LICENSE APPLICATION, DECEMBER 21, 1970, DOCKET 50-267, TYPE--HTGR, MFG--G.A., AE--G.A.

ON PAGE 9.4-15 OF THE FSAR YOU STATE THAT IN THE EVENT OF FAILURES IN THE HELIUM PURIFICATION SYSTEM REGENERATION SECTION OR IN THE HYDROGEN GETTER SECTION, UP TO 50 PERCENT OF THE ACTIVITY CONTAINED IN THE CLEANUP SYSTEM COULD BE RELEASED (PRIMARILY KR-85 AND TRITIUM). YOU FURTHER STATE THAT SUCH ACTIVITY RELEASED WOULD BE SWEPT AWAY AND FILTERED BY THE VENTILATION SYSTEM. PRESENT THE BASES FOR THE VALUE OF 50 PERCENT RELEASE AND INDICATE WHY IT COULD NOT BE 100 PERCENT OF THE PURIFICATION TRAIN CONTENTS AND A SIGNIFICANT FRACTION OF THE PRIMARY COOLANT IF THE FAILURE SHOULD OCCUR BETWEEN THE PCRV AND THE HIGH TEMPERATURE FILTER/ABSORBER UNITS. *** ANSWER ON PG 9.10-1 THRU -3, PLUS 1 FIGURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*FAILURE + REACTOR, GRAPHITE MODERATED + KRYPTON + VENTILATION SYSTEM + HELIUM + *RADIOACTIVITY RELEASE + *RESPONSE TO NRC QUESTION + *COOLANT PURIFICATION SYSTEM + *FT. ST. VRAIN (HTGR) + REACTOR, HTGR

058945
RESPONSE TO QUESTION 9.12 - EFFECTS OF LIOH ON COOLING WATER
PUBLIC SERVICE COMPANY OF COLORADO
DOCKET-50267-24 +. 1 PAGE, PG 9.12-1 OF AMENDMENT 17 TO FT. ST. VRAIN LICENSE APPLICATION, DECEMBER 21, 1970, DOCKET 50-267, TYPE--HTGR, MFG--G.A., AE--G.A.

YOU STATE THAT LITHIUM HYDROXIDE IS ADDED TO THE PCRV COOLING WATER TO CONTROL PH (PAGE 9.7-1). IS THIS LITHIUM ENRICHED IN LI-7. WHAT IS THE NEUTRON FLUX AS A FUNCTION OF ENERGY RANGE IN THE AREA OF THE PCRV IN WHICH THIS COOLING WATER SYSTEM IS LOCATED. CALCULATE THE TRITIUM PRODUCTION RATE AS A RESULT OF NEUTRON ACTIVATION OF THE LITHIUM IN THE COOLING WATER AND STATE ALL ASSUMPTIONS. *** ANSWER ON PG 9.12-1.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GRAPHITE MODERATED + *STEEL LINER + LITHIUM + *RADIONUCLIDE, INDUCED + *RESPONSE TO NRC QUESTION + *FT. ST. VRAIN (HTGR) + REACTOR, HTGR + ADDITIVE + COOLING + HYDROXIDE + *PRODUCTION, RATE

058951
RESPONSE TO QUESTION 11.2 - DISPOSAL OF CERTAIN WASTES
PUBLIC SERVICE COMPANY OF COLORADO
DOCKET-50267-24 +. 1 PAGE, PG 11.2-1 OF AMENDMENT 17 TO FT. ST. VRAIN LICENSE APPLICATION, DECEMBER 21, 1970, DOCKET 50-267, TYPE--HTGR, MFG--G.A., AE--G.A.

AS A RESULT OF THE DISCUSSION OF THE WASTE TREATMENT SYSTEMS, WE UNDERSTAND THAT (1) THE LIQUID-WASTE-TREATMENT DEMINERALIZER IS TO BE DISPOSED OF WHEN IT IS SPENT AND (2) THERE ARE PROVISIONS IN THE HELIUM-PURIFICATION-SYSTEM FILTER TRAIN THAT WOULD ALLOW THE REGENERATION OF THE CRYOGENIC AND HYDROGEN-GETTER COMPONENTS TO A CLOSED SYSTEM AND THENCE TO THE ENVIRONMENT. DESCRIBE THESE SYSTEMS IN SUFFICIENT DETAIL TO CONFIRM THESE CAPABILITIES. *** ANSWER ON PG 112-1.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GRAPHITE MODERATED + TITANIUM + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, SOLID + *POPULATION EXPOSURE + *WASTE MANAGEMENT + *WASTE TREATMENT, EQUIPMENT + RESIN + *RESPONSE TO NRC QUESTION + *FT. ST. VRAIN (HTGR) + REACTOR, HTGR

059476
RESPONSE TO QUESTION 11.4 - TRITIUM
OMAHA PUBLIC POWER DISTRICT
DOCKET-50285-39 +. 1 PAGE, PG XIII OF AMENDMENT 22 TO FORT CALHOUN 1 LICENSE APPLICATION, JANUARY 8, 1971, DOCKET 50-285, TYPE--PWR, MFG--COMB., AE--GIBBS + HILL

PROVIDE AN ANALYSIS OF THE PRODUCTION RATE, DISTRIBUTION, AND DISCHARGE OF TRITIUM FROM THE PLANT. WHAT METHODS WILL BE USED TO EVALUATE AND ACCOUNT FOR THE TRITIUM CONTAINED IN EFFLUENTS FROM THE PLANT. *** ANSWER IN SECT. 11.1.2

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + *WASTE DISPOSAL, LIQUID + RESPONSE TO NRC QUESTION + FT. CALHOUN (PWR) + *DISTRIBUTION + *PRODUCTION, RATE

059547
RESPONSE TO QUESTION 10.3 - TRITIUM
THE DETROIT EDISON COMPANY
DOCKET-50341-25 +. 2 PAGES, PG 10.3-1 AND -2 OF AMENDMENT 15 TO FERMI 2 LICENSE APPLICATION, FEBRUARY 1, 1971, DOCKET 50-341, TYPE--BWR, MFG--G.E., AE--SGT + LUNDY

PROVIDE CALCULATIONS OF THE ANTICIPATED TRITIUM PRODUCTION AND DISCHARGE FROM THE PLANT. STATE TOTAL CURIES RELEASE PER YEAR, AND THE TRITIUM CONCENTRATONS AND TOTAL ACTIVITY PER BATCH. *** ANSWER ON PG 10.3-1 AND -2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + DOSE + *REGULATION, AEC + *WASTE DISPOSAL, LIQUID + POPULATION EXPOSURE + RESPONSE TO NRC QUESTION + FERMI 2 (BWR) + *PRODUCTION + CONCENTRATION

059661
RESPONSE TO QUESTION 9.2 - TRITIUM
COMMONWEALTH EDISON COMPANY + IOWA-ILLINOIS GAS AND ELECTRIC COMPANY
DOCKET-50254-27 +. 1 PAGE, PG 9.2-1 OF AMENDMENT 16 TO LICENSE APPLICATION FOR QUAD CITIES 1-2, FEBRUARY 8, 1971, DOCKETS 50-254/265, TYPE--BWR, MFG--G.E., AE--SGT + LUNDY

WITH RESPECT TO YOUR REPLY TO QUESTION 9.2C, AMENDMENT 13, YOUR ESTIMATES OF TRITIUM FORMATION BY ACTIVATION OF DEUTERIUM NATURALLY PRESENT IN THE COOLING WATER SHOULD BE REVIEWED CONSIDERING THE ESTIMATES SUBMITTED FOR THE LIMERICK NUCLEAR STATION, DOCKET NUMBERS 50-352 AND 353, QUESTION 9.3 OF SUPPLEMENT 1. PROVIDE CORRESPONDING ESTIMATES OF OFFSITE RELEASES OF LIQUID WASTE, RELATING THESE TO THE MPCW. *** (ANSWER) WE HAVE COMPLETED OUR REVIEW RELATING TO TRITIUM FORMATION AND HAVE REVISED SECTION 9 OF THE PSAR TO CLARIFY THE RESULTS. (SEE PART I OF THIS AMENDMENT). THE REFERENCED RADIOACTIVITY CONTROL EQUIPMENT FOR THE GASEOUS EFFLUENTS IS CURRENTLY UNDER STUDY AND DATA WILL BE SUBMITTED WHEN AVAILABLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + *WASTE DISPOSAL, GAS + *WASTE DISPOSAL, LIQUID + RESPONSE TO NRC QUESTION + QUAD CITIES 1 (BWR) + QUAD CITIES 2 (BWR) + *PRODUCTION

060133
RESPONSE TO QUESTION 11.4 - TRITIUM - PRODUCTION RATE
PUBLIC WERVICE COMPANY OF COLORADO
DOCKET-50267-27 +. 2 PAGES, PG 11.4-1 AND -2 OF AMENDMENT 18 TO LICENSE APPLICATION OF FT. ST. VRAIN, FEBRUARY 18, 1971, DOCKET 50-267, TYPE--HTGR, MFG--G.A., AE--G.A.

ON PAGE 11.1-5 OF THE FSAR YOU PRESENT A CALCULATION OF THE EXPECTED TRITIUM PRODUCTION RATES. HOWEVER, SEVERAL RELEVANT PARAMETERS WERE OMITTED. *** ANSWER ON PG 11.4-1 AND -2.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GRAPHITE MODERATED + *RESPONSE TO NRC QUESTION + FT. ST. VRAIN (HTGR) + REACTOR, HTGR + *PRODUCTION, RATE

065354
REPLY TO QUESTIONS BY SURVEILLANCE BRANCH, DIVISION OF SURVEILLANCE AND INSPECTION, RADIATION OFFICE, ENVIRONMENTAL PROTECTION AGENCY
13 PAGES, REPLY TO LETTER OF E. N. CRAMER, S. CALIFORNIA EDISON, WRITTEN TO C. L. WEAVER, FEBRUARY 10, 1971

QUESTIONS SUBMITTED - (1) ANY LARGE-SCALE RADIATION BACKGROUND SURVEYS OF L.A. AREA, (2) RADIATION DOSE TO U.S. CITIZEN, (3) INCREASED MORTALITY IN DENVER OR HIGH-RADIATION AREA, (4A) DOSE TO PEOPLE FROM MEDICAL SOURCES, (4B) FROM K-40, (4C) FROM VARIOUS BUILDING MATERIALS, (4D) FROM JET FLIGHTS, (4E) FROM BEER, (4F) FROM CIGARETTES, (4G) FROM DIAGNOSTIC X-RAY, (4H) FROM WELL WATER, (4I) CANCER ASSOCIATED THEREFROM, (4J) DOSE TO PILOTS AND STEWARDESSES, (5) CONCLUSION OF USPHS ON EMISSION OF NUCLIDES FROM N-POWER PLANTS VIZ., BUILDUP IN ENVIRONMENT, DOSE TO POPULATION, EXCESS DEATHS DUE TO RADIATION.

CESIUM + DOSE + FISSION PRODUCT RELEASE + *RADIATION IN PERSPECTIVE + STRONTIUM + WATER + LEAD + POLONIUM + POTASSIUM + REACTOR, POWER + AIRCRAFT + POPULATION EXPOSURE + CRITICAL NUCLIDE PATHWAY + ENVIRONMENT + X-RAY + *MONITORING PROGRAM, ENVIRONMENTAL + MORTALITY + RADIATION EFFECT + *RADIATION EXPOSURE + CANCER + AGENCY, FEDERAL

065892
TECH-SPEC CHANGE 9 GRANTED FOR MIT RESEARCH REACTOR
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF REACTOR LICENSING
2 PAGES, LETTER - DIVISION OF REACTOR LICENSING (AEC) TO MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DECEMBER 12, 1971, DOCKET 50-20

THE PROPOSED LIMITING CONDITION OF OPERATION FOR SECONDARY WATER TRITIUM CONCENTRATION OF 1 UCI/LITER IS WELL BELOW THE TRITIUM LIMITS SPECIFIED IN 10 CFR 20 FOR WATER EFFLUENTS TO UNRESTRICTED AREAS. SIGNIFICANT DILUTION, CONSIDERING ONLY MIT DISCHARGE TO THE SEWERS, WILL FURTHER REDUCE THE TRITIUM CONCENTRATION IN THE SEWAGE WATER TO LESS THAN 1 PERCENT OF 10 CFR 20 LIMITS.

065892 *CONTINUED*
AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

MPC + *REACTOR, RESEARCH + WASTE DISPOSAL, LIQUID + *TECHNICAL SPECIFICATIONS + COLLEGES AND UNIVERSITIES

066849
PENDING DOCKET DIGEST OF OCTOBER 28
3 PAGES, ATOMIC ENERGY CLEARING HOUSE, 17(44), PP. 32-34 (NOVEMBER 1, 1971)

A SUMMARY OF SITUATIONS INVOLVING LICENSING PROCEEDINGS AROUND THE COUNTRY. UNDER ITEMS COVERED ARE TOPICS SUCH AS FACILITY INVOLVED, TYPE, STATUS OF ASLB OR ASLAB HEARING AND DISPOSITION, INTERVENORS, DATES OF VARIOUS ACTIONS, ETC. TWO OTHER TOPICS ARE REVIEWED - (1) RULE MAKING -- (A) REPORTING AND CONTROL REQUIREMENTS FOR TRITIUM, AND (B) CONTAINMENT-LEAKAGE TESTING FOR WATER-COOLED POWER REACTORS. (2) GENERAL LITIGATION -- A REVIEW OF COURT ACTIONS BY CONSERVATIONIST AND ANTIWAR GROUPS TO PREVENT THE NUCLEAR WEAPONS TEST ON AMCHITKA ISLAND; THEIR CONTENTIONS UNDER NEPA, LIMITED TEST BAN TREATY, AND REQUEST FOR AN IN-CAMERA REVIEW OF CERTAIN DOCUMENTS. ANOTHER COURT CASE INVOLVES A UTAH FAMILY CHARGING AEC WITH EXCEEDING FRC GUIDELINES AT NEVADA TEST SITE, VIOLATION OF NEPA, SECRECY, AND, ACCORDINGLY, ENJOINING AEC FROM FURTHER TESTING.

CODES AND STANDARDS + CONTAINMENT + TEST, WEAPONS + REACTOR, POWER + *REGULATION, AEC + TRIGA (RR) + PALISADES (PWR) + VERMONT YANKEE (BWR) + SHOREHAM (BWR) + *SURVEY + *ASLB + MIDLAND 1 (PWR) + TEST, LEAK + *LITIGATION + OPPONENT + ORGANIZATION, CITIZEN + PUBLIC HEARING + NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

068802
ENVIRONMENTAL STATEMENT. UNDERGROUND NUCLEAR TEST PROGRAMS
U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
PB-202605-F +. 93 PAGES, SEPTEMBER 1971

ENVIRONMENTAL COSTS ARE BALANCED AGAINST THE BENEFITS OF TESTING. THE NEVADA TEST SITE IS ALREADY COMMITTED. WATER WILL BE ENTIRELY ACCEPTABLE FOR DRINKING BEFORE MOVING OFF GOVERNMENT-CONTROLLED LANDS. PRECAUTIONS ARE TAKEN TO PROTECT THE PUBLIC IN CASE OF AN ACCIDENTAL RELEASE OF RADIOACTIVITY. GROUNDWATER IS RELATIVELY DEEP AND SLOW MOVING. INTENSIVE SAMPLING OF ABOUT 100 WATER WELLS AND USE POINTS ON SITE AND OFF SITE HAS DETECTED NO RADIOACTIVITY. COMMENTS OF FEDERAL AND OTHER AGENCIES AND AEC'S RESPONSES ARE ANNEXED. IT IS EXPECTED TO PUBLISH FURTHER INFORMATION IN THE AREA OF RADIONUCLIDE TRANSPORT AS THE RESULT OF STUDIES UNDERWAY.

ECOLOGY + IODINE + KRYPTON + PLUTONIUM + RADIATION IN PERSPECTIVE + *SURFACE WATER, NUCLIDE OCCURRENCE + *GROUND WATER, NUCLIDE OCCURRENCE + NEVADA TEST SITE + HYDROLOGY + *RADIONUCLIDE TRANSFER + REPORT, ENVIRONMENTAL

069587
RESPONSE TO QUESTION 11.36 - COOLANT-TRITIUM CONCENTRATION
COMMONWEALTH EDISON COMPANY
DOCKET-50295-31 +. 2 PAGES, PGS. Q11.36-1 THRU -2 OF AMENDMENT 16 TO ZION 1 AND 2 LICENSE APPLICATION, OCTOBER 21, 1971, DOCKET 50-295, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

DISCUSSES THE MAXIMUM COOLANT-TRITIUM CONCENTRATION EXPECTED AND THE OPERATIONAL LIMIT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACTIVITY BUILDUP + REACTOR, PWR + REACTOR COOLANT + RESPONSE TO NRC QUESTION + ZION 1 (PWR) + ZION 2 (PWR)

069588
RESPONSE TO QUESTION 11.37 - TRITIUM DISPOSAL
COMMONWEALTH EDISON COMPANY
DOCKET-50295-31 +. 1 PAGE, PG. Q11.37-1 OF AMENDMENT 16 TO ZION 1 AND 2 LICENSE APPLICATION, OCTOBER 21, 1971, DOCKET 50-295, TYPE--PWR, MFG--WEST., AE--STONE + WEBSTER

STATES THAT THE DISPOSITION OF THE TRITIATED CONTROL VOLUME INVENTORY AT THE END OF PLANT LIFE WILL BE DECIDED UPON AT A TIME FAR ENOUGH IN THE FUTURE TO ENABLE CONSIDERATION OF ADVANCES IN TECHNOLOGY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + WASTE DISPOSAL, LIQUID + RESPONSE TO NRC QUESTION + ZION 1 (PWR) + ZION 2 (PWR)

069648
RESPONSE TO QUESTION 9.3 - CONTROL OF TRITIUM CONTAMINATION
MAINE YANKEE ATOMIC POWER COMPANY
DOCKET-50309-31 +. 1 PAGE, PG. 9.3 OF AMENDMENT 21 TO MAINE YANKEE LICENSE APPLICATION, MARCH 30, 1971, DOCKET 50-309, TYPE--PWR, MFG--COMB., AE--STONE + WEBSTER

DISCUSSES THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED. PROVIDES ANALYSIS OF THE FRACTION OF PRIMARY COOLANT TRITIUM THAT WILL BE RELEASED TO THE CIRCULATING WATER DISCHARGE POINT. DESCRIBES THE METHODS TO BE EMPLOYED FOR MONITORING TRITIUM

069648 *CONTINUED*
CONCENTRATIONS PRIOR TO DISCHARGE FROM THE PLANT. DISCUSSES THE SPECIAL PRECAUTIONS TO BE TAKEN CONCERNING TRITIUM DURING REFUELING WITH RESPECT TO PLANT PERSONNEL AND RELEASES TO THE ENVIRONMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + *WASTE HANDLING + *WASTE MANAGEMENT + RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + MONITORING SYSTEM, RADIATION + MAINE YANKEE (PWR)

069713
THREE CHANGES TO TECH SPECS FOR NATICNAL BUREAU OF STANDARDS REACTOR
U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
DOCKET-50184-41 +. 5 PAGES, LETTER - U. S. ATOMIC ENERGY COMMISSION TO NATIONAL BUREAU OF STANDARDS - APRIL 4, 1972, DOCKET 50-184

CHANGE 5 AUTHORIZES 3 CHANGES TO THE TECH SPECS - (1) ELIMINATES AN INTERMEDIATE ADMINISTRATIVE POSITION. (2) EXEMPTS TRITIUM DISCHARGES FROM 10 CFR 20 LIMITS BECAUSE OF THE LARGE DILUTION AVAILABLE. (3) SETS LIMITS ON THE LEAK RATE FROM THE PRIMARY TO THE SECONDARY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, HWR + REACTOR, RESEARCH + TECHNICAL SPECIFICATIONS + *RADIOACTIVITY RELEASE + NBS + *LEAK RATE + *STAFFING

070528
RESPONSE TO QUESTION 9.7 - TRITIUM PRODUCTION
PUERTO RICO WATER RESOURCES AUTHORITY
DOCKET-50376-19 +. 2 PAGES, PG. 9.7-1 THRU 9.7-2 OF AMENDMENT 8 TO AGUIRRE LICENSE APPLICATION, AUGUST 2, 1971, DOCKET 50-376, TYPE--PWR, MFG--WEST., AE--GIBBS + HILL

BRIEF DISCUSSION OF TRITIUM PRODUCTION DURING OPERATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACTIVITY BUILDUP + *FUEL BURNUP + REACTOR, PWR + *RESPONSE TO NRC QUESTION + REPORT, PSAR + AGUIRRE 1 (PWR)

070788
RESPONSE TO QUESTION 9.6 - TRITIUM RELEASE
COMMONWEALTH EDISON COMPANY
DOCKET-50373-10 +. 3 PAGES, PG. Q 9.6-1 THRU Q 9.6-3 OF AMENDMENT 5 TO LASALLE 1 AND 2 LICENSE APPLICATION, OCTOBER 8, 1971, DOCKET 50-373/374, TYPE--BWR, MFG--G.E., AE--SGT + LUNDY

PROVIDES THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED, THE FRACTION OF PRIMARY COOLANT TRITIUM THAT WILL BE RELEASED TO THE DISCHARGE WATER HEADER, AND THE METHODS TO BE EMPLOYED FOR MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + *RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + CONCENTRATION + PRODUCTION, RATE + LA SALLE 1 (BWR) + LA SALLE 2 (BWR)

071896
RESPONSE TO QUESTION 9.4 - TRITIUM PRODUCTION AND RELEASE
NEBRASKA PUBLIC POWER DISTRICT
DOCKET-50298-27 +. 6 PAGES, PG. 9.4.1 THRU .6 OF AMENDMENT 9 TO COOPER LICENSE APPLICATION, MARCH 9, 1972, DOCKET 50-298, TYPE--BWR, MFG--G.E., AE--BURNS + ROE

DISCUSSES THE UNCERTAINTIES ASSOCIATED WITH ESTIMATING THE AMOUNTS OF TRITIUM GENERATED; PROVIDES ANALYSIS OF THE FRACTION OF PRIMARY-COOLANT TRITIUM THAT WILL BE RELEASED TO THE CIRCULATING WATER DISCHARGE CANAL; DESCRIBES THE METHODS FOR MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM THE PLANT; HOW THE TRITIUM CONCENTRATIONS IN THE DISCHARGE CANAL AND THE MIXED WATER SOURCE COMPARES WITH THE TRITIUM ALREADY PRESENT IN THE WATER SOURCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + MONITOR, LIQUID + *WASTE DISPOSAL, LIQUID + RESPONSE TO NRC QUESTION + FORECAST + COOPER (BWR) + CONCENTRATION + COMPARISON + PRODUCTION, RATE

072847
ENVIRONMENTAL IMPACT OF PLANT OPERATION UP TO JULY 1, 1972
CONSUMERS POWER COMPANY
DOCKET-50255-96 +. 200 PAGES, CPC SPECIAL REPORT TO DIRECTORATE OF LICENSING (AEC), JULY 19, 1972, DOCKET 50-255, TYPE--PWR, MFG--COMB., AE--BECHTEL

CORRELATES RADIOACTIVE AND THERMAL RELEASE DATA FOR THE FIRST 6 MONTHS OF OPERATION TO PINPOINT ENVIRONMENTAL EFFECTS, IF ANY. NO MEASURABLE INCREASE IN NORMAL CONCENTRATIONS OF RADIOACTIVE

072847 *CONTINUED*
MATERIAL WERE FOUND EXCEPT FOR SLIGHTLY HIGHER LEVELS OF TRITIUM. THE EFFECT ON PLANKTON IN PASSING THROUGH THE CONDENSER WAS MEASURED WITH AN WITHOUT HEATING. THE FISH STUDY INCLUDED ENTRAINMENT ON THE TRAVELING SCREEN, TRAWLING, GILL-NETTING, AND EGG AND LARVA SAMPLING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

OPERATION + REACTOR, PWR + ENVIRONMENT + *PALISADES (PWR) + THERMAL POLLUTION + RADIONUCLIDE UPTAKE + ANIMAL, FISH + PHYTOPLANKTON + ZOOPLANKTON + RADIATION EFFECT, ECOSYSTEM + *REPORT, ENVIRONMENTAL

074864
ENVIRONMENTAL STATEMENT - RIO BLANCO GAS STIMULATION PROJECT, RIO BLANCO COUNTY COLORADO
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
WASH-1519 +. 259 PAGES, TABLES, FIGURES, APRIL 1972

THIS ENVIRONMENTAL STATEMENT IS PREPARED IN COMPLIANCE WITH THE REQUIREMENTS OF THE NATIONAL ENVIRONMENTAL POLICY ACT AND IN SUPPORT OF THE ATOMIC ENERGY COMMISSION'S PARTICIPATION IN THE PROPOSED RIO BLANCO GAS STIMULATION PROJECT. IN ASSESSING AND BALANCING THE POTENTIAL VALUE OF THE NATURAL GAS CONTAINED IN LOW-PERMEABILITY RESERVOIRS OF THE ROCKY MOUNTAIN REGION AND THE NATION'S APPARENT SERIOUS NEED FOR SUPPLEMENTARY ENERGY SOURCES IN THE NEXT TEN TO THIRTY YEARS AGAINST THE COSTS INVOLVED AND IN CONSIDERING THE AVAILABLE ALTERNATIVES, THE AEC HAS CONCLUDED THAT THE PROPOSED PROJECT IS THE BEST AVAILABLE ALTERNATIVE, THAT THE BENEFITS OF THE PROPOSED ACTION OUTWEIGH ITS PROBABLE ENVIRONMENTAL COSTS, AND THAT THE PROJECT SHOULD BE IMPLEMENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

GEOLOGY + *PLOWSHARE + SEISMOLOGY + MONITOR, GAS + NUCLEAR DETONATION + POPULATION EXPOSURE + GROUND MOTION + *GAS + CONSUMER PRODUCT + *STIMULATION + AGENCY, AEC + RESOURCE, NATURAL + *BENEFIT VS RISK + BENEFICIAL USE + *STATEMENT, ENVIRONMENTAL

075623
WEBSTER BH
PROBLEMS IN MEETING AEC REPORTING AND COMPLIANCE REQUIREMENTS
CAROLINA POWER AND LIGHT COMPANY
ORP/SID-72-4 +. 14 PAGES, PP. 15-28 OF THE PROCEEDINGS OF THE SOUTHERN CONFERENCE ON ENVIRONMENTAL RADIATION PROTECTION FROM NUCLEAR POWER PLANTS, APRIL 21-22, 1971

A DISCUSSION BY THE PRINCIPAL RADIATION CONTROL ENGINEER OF THE CAROLINA POWER AND LIGHT CO. CONCERNING THE RADIATION SAFETY AND CONTROL MEASURES INVOLVED WITH THE EFFLUENTS OF THE H. B. ROBINSON PLANT.

AVAILABILITY - U. S. ENVIRONMENTAL PROTECTION AGENCY, RADIATION PROGRAMS OFFICE, WASHINGTON, D. C. 20460

DILUTION + *EFFLUENT + ELEMENTS AND ISOTOPES + SITING + REGULATION, AEC + *MONITOR + *RADIATION SAFETY AND CONTROL + RADIOLOGICAL ASSISTANCE + *ROBINSON 2 (PWR) + LAKE + COOLING POND + DATA COLLECTION + *CONCENTRATION + *DISCHARGE

076805
RESPONSE TO QUESTION 11.4 - DETECTING TRITIUM WITHIN CONTAINMENT
LOUISIANA POWER AND LIGHT CO.
DOCKET-50382-15 +. 1 PAGE, P. Q11.4-1, AMENDMENT 9 TO WATERFORD UNIT 3 PSAR, JAN. 7, 1972, DOCKET 50-382, TYPE--PWR, MFG--COMB., AE--EBASCO

DISCUSS YOUR PROPOSED METHODS FOR DETECTING TRITIUM VAPOR WITHIN THE CONTAINMENT PERSONNEL ACCESS CONTROL. *** ANSWER - DETECTION OF TRITIUM VAPOR WITHIN THE CONTAINMENT AS RELATED TO CONTAINMENT PERSONNEL ACCESS CONTROL WILL BE EFFECTED BY SAMPLING CONDENSATE OBTAINED FROM CONDENSED MOISTURE IN THE CONTAINMENT ATMOSPHERE. TRITIUM ACTIVITY WILL BE MEASURED WITH A LIQUID SCINTILLATION DETECTOR.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*CONTAINMENT + REACTOR, PWR + *MONITOR + RESPONSE TO NRC QUESTION + *CONCENTRATION + WATERFORD 3 (PWR)

077011
FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (HPIS/251)
U.S. ATOMIC ENERGY COMMISSION, DIRECTORATE OF REGULATORY STANDARDS
WASH-1258, VOL. 2 +. 300 PAGES, FIGURES, TABLES, REFERENCES, JULY 1973

CONTINUED FROM NSIC/77010. APPENDIX A - PRINCIPAL PARAMETERS USED IN SOURCE TERM CALCULATIONS; B - BASES FOR THE PRINCIPAL PARAMETER USED IN SOURCE TERM; C - COMPUTER CODES TO CALCULATE RELEASES OF RADIOACTIVITY IN GASEOUS, LIQUID EFFLUENTS FROM LWR'S; D - RADWASTE SYSTEM COST ESTIMATES; E - KRONIC COMPUTER PROGRAM FOR CALCULATING ANNUAL AVERAGE EXTERNAL DOSES FROM CHRONIC ATMOSPHERE RELEASES OF RADIONUCLIDES; F - COMPUTATIONAL MODELS FOR CALCULATING DOSES FROM RADIONUCLIDES IN THE ENVIRONMENT. PRINCIPAL PARAMETERS COMPILED BY REGULATORY STAFF INTO A LIST TO STANDARDIZE CALCULATION OF RADIOACTIVE SOURCE TERMS, LATTER DEFINED AS AVERAGE AMOUNT RADIOACTIVE MATERIAL RELEASED TO ENVIRONMENT FROM NUCLEAR POWER REACTOR DURING NORMAL OPERATION (40-YEAR OPERATIONAL EXPECTANCY). PWR TRITIUM RELEASED IN LIQUID WASTE FOR ZIRCALOY CLAD FUEL = 350 CI/YR-REACTOR AND FOR STAINLESS STEEL CLAD FUEL = 5,000 CI/YR/REACTOR. GAS/WATER IODINE PARTITION VS PH, ARRRG, CRITR, GRONK PROGRAMS FOR CALCULATING INTERNAL DOSES TO INDIVIDUALS AND POPULATIONS. ARGIN, REL,

077011 *CONTINUED*
CRITEN, GIN, TONIC, DATA FILES FOR DOSE CALCULATION PROGRAMS. CF HPIS/252.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + *CODES AND STANDARDS + *COMPUTER PROGRAM + DESIGN CRITERIA + HUMBOLDT BAY (BWR) + IODINE + REACTOR, PWR + ELECTRIC POWER + DOSE CALCULATION, INTERNAL + REGULATION, AEC + POPULATION EXPOSURE + DOSE CALCULATION, EXTERNAL + ENVIRONMENT + FUEL REPROCESSING + PHYSIOLOGY/METABOLISM + FOOD CHAIN + MAN + EFFECT, PH + POWER PLANT, NUCLEAR + STATEMENT, ENVIRONMENTAL + NRC REGULATORY GUIDE + HPIS

078809
RESPONSE TO QUESTION 3.5E - HISTORY OF CONTAINMENT PURGES
CAROLINA POWER AND LIGHT CO.
DOCKET-50261-137 +. 2 PAGES, 1 TABLE, SUPPLEMENT 1 TO ENVIRONMENTL REPORT FOR H.B. ROBINSON, UNIT 2, JAN. 15, 1973, DOCKET 50-261, TYPE--PWR, MFG--WEST., AE--EBASCO

FREQUENCY AND SCHEDULES OF CONTAINMENT PURGES ARE DISCUSSED AND DELINEATED. TOTAL ACTIVITY RELEASED IN 11 PURGES WAS 22 CURIES OF GASEOUS ACTIVITY, 0.83 OF PARTICLES, 1.56 TRITIUM, AND 0.039 CURIE OF GROSS IODINE. RADIATION LEVELS IN CONTAINMENT ARE MONITORED USING TLD BADGES; RESULTS FOR 6 MONTH PERIOD ARE GIVEN IN TABLE. AT PRESENT, RECIRCULATION FILTERS ARE RUN CONTINUOUSLY IN CONTAINMENT BUILDING. FILTERS ARE BOTH HEPA AND CHARCOAL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AIR CLEANING + CONTAINMENT + FILTER SYSTEM + IODINE + REACTOR, PWR + CONTAINMENT FILTERING SYSTEM + RADIOACTIVITY RELEASE + RESPONSE TO NRC QUESTION + ROBINSON 2 (PWR) + DATA COLLECTION + REPORT, ENVIRONMENTAL

079914
RESPONSE TO QUESTION J.4 - CAPABILITIES OF THE WASTE PROCESSIVE SYSTEM
POWER AUTHORITY OF THE STATE OF NEW YORK
DOCKET-50333-43 +. 1 PAGE, P. Q.J.4-1, AMENDMENT 7 TO JAMES A. FITZPATRICK FSAR, APRIL 18, 1972, DOCKET 50-333, TYPE--BWR, MFG--G.E., AE--STONE AND WEBSTER

AT AN ANNUAL RELEASE OF 83 CURIES EXCLUSIVE OF TRITIUM, BASED ON A FAILED FUEL BASIS OF 100,000 MICROCI/SEC AT 30 MIN DECAY TIME, THE PLANT MEETS THE PROPOSED REQUIREMENT THAT THE ANNUAL EXPOSURES TO THE WHOLE BODY OR ANY ORGAN OF AN INDIVIDUAL SHALL NOT BE IN EXCESS OF FIVE MILLIREMS IN LIQUID EFFLUENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + EFFLUENT + FITZPATRICK (BWR) + *WASTE TREATMENT + WASTE TREATMENT, LIQUID + WASTE DISPOSAL, LIQUID + RESPONSE TO NRC QUESTION + SYSTEM CAPABILITY + *CONCENTRATION

081014
RESPONSE TO QUESTION 11.7.3 - TRITIUM MONITORING
WISCONSIN PUBLIC SERVICE CORPORATION
DOCKET-50305-25 +. 1 PAGE, PG. 11.7.3-1 OF AMENDMENT TO KEWAUNEE FSAR, SEPTEMBER 15, 1971, DOCKET 50-305, TYPE--PWR, MFG--WEST., AE--PIONEER SERV.

PROVIDE A DESCRIPTION OF THE METHODS TO BE USED TO MONITOR TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM THE PLANT.***RESPONSE - ALL RADIOACTIVE LIQUID BATCH RELEASES WILL BE SAMPLED AND ANALYZED FOR TRITIUM USING A REFRIGERATED LIQUID SCINTILLATION COUNTER. SAMPLE PREPARATION WILL BE CARRIED OUT USING AN APPROVED PROCEDURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + *WASTE DISPOSAL + *MONITOR + RESPONSE TO NRC QUESTION + KEWAUNEE (PWR)

081431
RESPONSE TO QUESTION 11.21 - RELEASES OF TRITIUM AND KRYPTON-85
INDIANA AND MICHIGAN POWER CO.
DOCKET-50315--95 +. 1 PAGE, PG. 11.21-1 OF AMENDMENT 36 TO DONALD C. COOK FSAR, JAN. 30, 1973, DOCKETS 50-315/316, TYPE--PWR, MFG--WEST., AE--UTILITY

THE BASIS FOR OUR ESTIMATED RELEASES OF TRITIUM AND KRYPTON-85 ARE THE ISOTOPIC SOURCE TERMS OF OUR LIQUID AND GASEOUS RADIOACTIVE RELEASES GIVEN BY WESTINGHOUSE. THE TABLES ARE ESTABLISHED ON THE DESIGN BASIS OF 1% FAILED FUEL. IT IS ALSO ASSUMED THAT NEITHER TRITIUM NOR K-85 WILL BE SUBSTANTIALLY DECAYED BEFORE RELEASE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT + KRYPTON + REACTOR, PWR + RELEASE RATE + WASTE DISPOSAL + RESPONSE TO NRC QUESTION + COOK 1 (PWR) + COOK 2 (PWR)

084179
RESPONSE TO QUESTION 11.12 - TRITIUM PRODUCTION AND DISCHARGE
ARKANSAS POWER AND LIGHT CO.

084179 *CONTINUED*
DOCKET-50313-47 +. 2 PAGES, PP. 11.12 THRU 11.12A OF AMENDMENT 28 TO ARKANSAS NUCLEAR 1 LICENSE APPLICATION, AUGUST 18, 1972, DOCKET 50-313, TYPE--PWR, MFG--B+W, AE--BECHTEL

UNCERTAINTIES IN THE AMOUNT OF TRITIUM GENERATED MAY BE ATTRIBUTABLE TO UNCERTAINTIES WHICH MAY EXIST IN THE BASIC NUCLEAR DATA, THE PARAMETERS (SUCH AS NEUTRON FLUXES AND FLUX SPECTRUM) USED TO CALCULATE THE TRITIUM PRODUCTION RATE, THE MODEL USED TO ACCOUNT FOR THE CHANGING REACTOR COOLANT BORON CONCENTRATION, AND THE ASSUMED AMOUNT OF THE TRITIUM PRODUCED BY TERNARY FISSION THAT REACHES THE REACTOR COOLANT. THE EXPECTED TRITIUM DISCHARGE PER YEAR IS 503 CURIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

EFFLUENT + REACTOR, PWR + *RELEASE RATE + *RESPONSE TO NRC QUESTION + ARKANSAS NUCLEAR 1 (PWR) + *PRODUCTION, RATE + DISCHARGE

088495
FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (HPIS/251)
U.S. ATOMIC ENERGY COMMISSION, DIRECTORATE OF REGULATORY STANDARDS
WASH-1258, VOL.2 +. 300 PAGES, FIGURES, TABLES, REFERENCES, JULY 1973

CONTD FROM NSIC/88496. APPENDIX A - PRINCIPAL PARAMETERS USED IN SOURCE TERM CALCNS; B - BASES FOR THE PRINCIPAL PARAMETER USED ON SOURCE TERM; C - COMPUTER CODES TO CALC RELEASES OF RADIOACTIVITY IN GASEOUS, LIQUID EFFLUENTS FROM LWR'S; D - RADWASTE SYSTEM COST ESTIMATES; E - KRONIC COMPUTER PROGRAM FOR CALCNG ANNUAL AVERAGE EXTERNAL DOSES FROM CHRONIC ATMOS RELEASES OF RADIONUCLIDES; F - COMPUTATIONAL MODELS FOR CALCNG DOSES FROM RADIONUCLIDES IN THE ENVIRONMENT. PRINCIPAL PARAMETERS COMPILED BY REGULATORY STAFF INTO A LIST TO STANDARDIZE CALCN OF RADIOACTIVE SOURCE TERMS, LATTER DEFINED AS AV AMT RADIOACT MATERIAL RELEASED TO ENV FROM NUCLEAR POWER REACTOR DURING NORMAL OPERATION (40-YR OPERATIONAL EXPECTANCY).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BWR + *CODES AND STANDARDS + *COMPUTER PROGRAM + DESIGN CRITERIA + HUMBOLDT BAY (BWR) + IODINE + REACTOR, PWR + DOSE CALCULATION, INTERNAL + REGULATION, AEC + POPULATION EXPOSURE + DOSE CALCULATION, EXTERNAL + ENVIRONMENT + FUEL REPROCESSING + PHYSIOLOGY/METABOLISM + FOOD CHAIN + MAN + EFFECT, PH + POWER PLANT, NUCLEAR + STATEMENT, ENVIRONMENTAL + HPIS + JACOBS

090772
RESPONSE TO QUESTION 11.15 - TRITIUM SHIPMENT
TENNESSEE VALLEY AUTHORITY, CHATTANOOGA
DOCKET-50438-16 +. 1 PAGE, PG. 11.15-1 OF AMENDMENT 4 TO BELLEFONTE 1 AND 2 LICENSE APPLICATION, OCTOBER 5, 1973, DOCKETS 50-438/439, TYPE--PWR, MFG--B+W, AE--TVA

TABLE 11.5-2 HAS BEEN REVISED TO SHOW 420 CURIES OF TRITIUM SHIPPED FROM THE PLANT. UNTIL RECENTLY, TVA HAD PLANNED TO SHIP TRITIATED LIQUID IN TANK TRAILERS OF ABOUT 5000 GALLONS CAPACITY. TVA HAS SINCE LEARNED THAT AEC DOES NOT CONSIDER SHIPMENT OF RADIOACTIVE LIQUIDS TO BE ACCEPTABLE. HENCE, TVA IS REEVALUATING ALTERNATIVE METHODS FOR DISPOSING OF TRITIATED LIQUID.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + TRANSPORTATION AND HANDLING + *WASTE DISPOSAL + *WASTE TRANSPORTATION + RESPONSE TO NRC QUESTION + BELLEFONTE 1 (PWR) + BELLEFONTE 2 (PWR)

090775
RESPONSE TO QUESTION 12.10 - EXPOSURE DURING REFUELING
TENNESSEE VALLEY AUTHORITY, CHATTANOOGA
DOCKET-50438-16 +. 1 PAGE, PG. 12.10-1 OF AMENDMENT 4 TO BELLEFONTE 1 AND 2 LICENSE APPLICATION, OCTOBER 5, 1973, DOCKETS 50-438/439, TYPE--PWR, MFG--B+W, AE--TVA

IT IS EXPECTED THAT THE LARGEST PERSONNEL EXPOSURES TO TRITIUM WILL OCCUR ABOVE THE REFUELING CANAL WATER DURING REFUELING. A CALCULATION HAS BEEN PERFORMED UTILIZING A CONCENTRATION OF 1.25 MICROCURIE/CC IN THE REFUELING CANAL WATER, ASSUMING NO FORCED VENTILATION FLOW ABOVE THE WATER, AND CONSERVATIVELY ASSUMING A HIGH CONTAINMENT TEMPERATURE AND RELATIVE HUMIDITY. THE RESULTANT DOSE COMMITMENT TO AN INDIVIDUAL IN THIS ENVIRONMENT IS 10 MREM PER HOUR OF EXPOSURE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, PWR + *DOSE CALCULATION, INTERNAL + REFUELING + RESPONSE TO NRC QUESTION + RADIATION EXPOSURE + BELLEFONTE 1 (PWR) + BELLEFONTE 2 (PWR)

091773
RESPONSE TO QUESTION 12.2.4 - TRITIUM MONITORING
TOLEDO EDISON COMPANY
DOCKET-50346-67 +. 1 PAGE, PG. 12.2.4-1 OF AMENDMENT 17 TO DAVIS-BESSE LICENSE APPLICATION, NOVEMBER 19, 1973, DOCKET 50-346, TYPE--PWR, MFG--B+W, AE--BECHTEL

CONTINUOUS MONITORING TECHNIQUES FOR TRITIUM DETECTION WILL NOT BE USED SINCE THE EXPECTED TRITIUM CONCENTRATION WILL BE FACTORS OF 10-100 LESS THAN THE MPC LEVEL FOR TRITIUM IN AIR FOR RESTRICTED AREAS. IN ADDITION, THERE ARE NO COMMERCIAL INSTRUMENTS AVAILABLE WHICH WILL RELIABLY MONITOR AIRBORNE TRITIUM SINCE THEY ARE SENSITIVE TO CHANGES IN HUMIDITY AND RESPOND TO CERTAIN GASEOUS

091773 *CONTINUED*
RADIONUCLIDES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

REACTOR, PWR + MONITOR + RESPONSE TO NRC QUESTION + MONITORING SYSTEM, RADIATION + MONITOR, AREA

096601
RESPONSE TO QUESTION 11.3 - TRITIUM ACCUMULATION
WASHINGTON PUBLIC POWER SUPPLY SYSTEM, RICHLAND
DOCKET-50460-19 +. 1 PAGE, PG. Q11-1 OF AMENDMENT 4 TO WPPSS 1 LICENSE APPLICATION, MARCH 14, 1974, DOCKET 50-460, TYPE--PWR, MFG--B+W, AE--UNITD ENGR

THE GROWING CONCENTRATION OF TRITIUM IN THE PRIMARY COOLANT SYSTEM AND THE BORATED WATER STORAGE TANK, OVER THE 40 YEAR LIFETIME OF THE PLANT, IS CALCULATED BY USING THE GIVEN PHYSICAL MODEL AND ASSUMPTIONS. DURING NORMAL OPERATION A NET TOTAL OF 890 CI (ACCOUNTING FOR DECAY) IS EITHER PRODUCED IN OR LEAKS INTO THE PRIMARY COOLANT SYSTEM. THE PRIMARY COOLANT IS ASSUMED TO LOSE 15,000 GAL/YEAR TO THE RADWASTE SYSTEM.

AVAILABILITY - MICROSURANCE, INC., P.O. BOX 3522 OAK RIDGE, TENN. 37830

REACTOR, PWR + *RESPONSE TO NRC QUESTION + MAIN COOLING SYSTEM + *PRODUCTION + WPPSS 1 (PWR)

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

ACCELERATION
030610 P 2
ACCIDENT, STEAM LINE RUPTURE
022680 P 1 032438 P 3
ACTIVATION PRODUCT
033201 P 3
ACTIVITY BUILDUP
021603 P 1 022680 P 1 025191 P 2 030617 P 2
031698 P 3 032438 P 3 033201 P 3 033717 P 3
037742 P 4 041123 P 5 055527 P 11 069587 P 16
070528 P 17
ADDITIVE
058945 P 14
AGENCY, AEC
074864 P 18
AGENCY, FEDERAL
056406 P 11 056460 P 12 065354 P 15
AGENCY, STATE
056406 P 11 056460 P 12
AGUIRRE 1 (PWR)
070528 P 17
AIR
046924 P 10
AIR CLEANING
078809 P 19
AIRBORNE RELEASE
017924 P 1
AIRCRAFT
065354 P 15
ANALYTICAL TECHNIQUE
042253 P 7
ANIMAL, FISH
072847 P 17
AQUATIC ORGANISM
041759 P 6
ARKANSAS NUCLEAR 1 (PWR)
084179 P 19
ASLB
066849 P 16
AUXILIARY COOLING SYSTEM
030610 P 2
BEAVER VALLEY 1 (PWR)
046185 P 9
BELL (BWR)
031698 P 3 034797 P 3 034798 P 4
BELLEFONTE 1 (PWR)
090772 P 20 090775 P 20
BELLEFONTE 2 (PWR)
090772 P 20 090775 P 20
BENEFICIAL USE
074864 P 18
BENEFICIAL USE, AGRICULTURE
056477 P 12
BENEFICIAL USE, COMMERCIAL
056477 P 12
BENEFICIAL USE, RECREATIONAL
056460 P 12
BENEFICIAL USE, SPACE HEATING
056477 P 12
BENEFIT VS RISK
045390 P 8 074864 P 18
BIOACCUMULATION/TURNOVER
045390 P 8
BORON
030617 P 2 033201 P 3
BRITTLE FRACTURE
030610 P 2
BROWNS FERRY 1 (BWR)
055709 P 11
BROWNS FERRY 2 (BWR)
055709 P 11
BROWNS FERRY 3 (BWR)
055709 P 11
BRUNSWICK 1 (BWR)
041121 P 5 041123 P 5 041124 P 5 041125 P 5
041126 P 5
BRUNSWICK 2 (BWR)
041121 P 5 041123 P 5 041124 P 5 041125 P 5
041126 P 5
CALVERT CLIFFS 1 (PWR)
033201 P 3
CALVERT CLIFFS 2 (PWR)
033201 P 3
CANCER
065354 P 15
CESIUM
065354 P 15
CODES AND STANDARDS
066849 P 16 077011 P 18 088495 P 20
COLLEGES AND UNIVERSITIES
065892 P 15
COMPARISON
071896 P 17
COMPUTER PROGRAM
077011 P 18 088495 P 20
CONCENTRATION
058655 P 13 059547 P 15 070788 P 17 071896 P 17
075623 P 18 076805 P 18 079914 P 19
CONCENTRATION, PEAK TO AVERAGE
041125 P 5
CONSUMER PRODUCT
074864 P 18
CONTAINMENT
066849 P 16 076805 P 18 078809 P 19
CONTAINMENT FILTERING SYSTEM
078809 P 19
CONTAMINATION
022680 P 1
CONTROL ROD DRIVE MECHANISMS
030610 P 2
CONTROL RODS
030617 P 2 045649 P 8 056228 P 11
COOK 1 (PWR)
081431 P 19
COOK 2 (PWR)
081431 P 19
COOLANT CHEMISTRY
055883 P 11
COOLANT PURIFICATION SYSTEM
058943 P 14
COOLANT QUALITY
041123 P 5
COOLING
058945 P 14
COOLING POND
045919 P 8 075623 P 18
COOLING, SHUTDOWN
030610 P 2
COOPER (BWR)
071896 P 17
CORE COMPONENTS
030494 P 2
CRITICAL NUCLIDE PATHWAY
045390 P 8 065354 P 15
DATA COLLECTION
075623 P 18 078809 P 19
DESALTING
056477 P 12
DESIGN CRITERIA
077011 P 18 088495 P 20
DESTRUCTIVE WIND
030610 P 2
DILUTION
045877 P 8 046027 P 9 046924 P 10 075623 P 18
DISCHARGE
057709 P 12 075623 P 18 084179 P 19
DISTRIBUTION
059476 P 14
DOSE
017924 P 1 034797 P 3 059547 P 15 065354 P 15
DOSE CALCULATION, EXTERNAL
077011 P 18 088495 P 20
DOSE CALCULATION, INTERNAL
045390 P 8 077011 P 18 088495 P 20 090775 P 20
DURATION, LONG
045649 P 8
EARTHQUAKE
030610 P 2
EARTHQUAKE ENGINEERING
030610 P 2
EASTON (BWR)
030610 P 2 030617 P 2
ECOLOGY
056460 P 12 068802 P 16

EFFECT, PH
077011 P 18 088495 P 20
EFFLUENT
022680 P 1 037151 P 4 075623 P 18 079914 P 19
081431 P 19 084179 P 19
ELECTRIC POWER
077011 P 18
ELEMENTS AND ISOTOPES
075623 P 18
EMERGENCY POWER, ELECTRIC
030610 P 2
ENVIRONMENT
065354 P 15 072847 P 17 077011 P 18 088495 P 20
ENVIRONMENTAL CONTROL MEASURE
056406 P 11 056477 P 12
EXCAVATION, NUCLEAR
045390 P 8
FAILURE
058943 P 14
FAILURE, TUBING
017924 P 1
FALLOUT
045390 P 8
FERMI 2 (BWR)
057868 P 13 059547 P 15
FILTER SYSTEM
078809 P 19
FISSION GAS RELEASE
030617 P 2
FISSION PRODUCT RELEASE
021603 P 1 034798 P 4 049311 P 10 056477 P 12
058307 P 13 065354 P 15
FISSION PRODUCT RETENTION
030617 P 2
FISSION PRODUCT TRANSPORT
046573 P 9
FISSION PRODUCT, IODINE
034797 P 3 034798 P 4
FISSION PRODUCT, VOLATILE
030617 P 2
FITZPATRICK (BWR)
079914 P 19
FLOOD
030610 P 2
FOOD CHAIN
046591 P 9 077011 P 18 088495 P 20
FORECAST
071896 P 17
FORKED RIVER 1 (PWR)
055527 P 11
FT. CALHOUN (PWR)
059476 P 14
FT. ST. VRAIN (HTGR)
058943 P 14 058945 P 14 058951 P 14 060133 P 15
FUEL BURNUP
055527 P 11 070528 P 17
FUEL ELEMENTS
056228 P 11
FUEL REPROCESSING
056406 P 11 056460 P 12 077011 P 18 088495 P 20
FUEL, FOSSIL
045390 P 8
GAS
074864 P 18
GEOLOGY
074864 P 18
GROUND MOTION
074864 P 18
GROUND WATER, NUCLIDE OCCURRENCE
045390 P 8 068802 P 16
HAZARD, RELATIVE
022680 P 1 031698 P 3
HAZARDS ANALYSIS
017924 P 1 022680 P 1 045390 P 8
HEAT EXCHANGERS
017924 P 1
HELIUM
058943 P 14
HPIS
077011 P 18 088495 P 20
HUMBOLDT BAY (BWR)
077011 P 18 088495 P 20
HYDROGEN
049779 P 10
HYDROLOGY
068802 P 16
HYDROLOGY, RATE OF MOVEMENT
045390 P 8
HYDROXIDE
058945 P 14
IDENTIFICATION
045287 P 8 046591 P 9
IMPOUNDMENT
042251 P 6 042252 P 7 042253 P 7
INDIAN POINT 2 (PWR)
041335 P 6
INDUSTRY, MANUFACTURING
056477 P 12
INDUSTRY, NUCLEAR
056406 P 11 056460 P 12 056477 P 12
INSTRUMENT, DETECTION FAILED FUEL ELEMENT
032438 P 3
IODINE
045390 P 8 056406 P 11 068802 P 16 077011 P 18
078809 P 19 088495 P 20
JACOBS
088495 P 20
JCAE
056477 P 12
KEWAUNEE (PWR)
081014 P 19
KRYPTON
056477 P 12 058943 P 14 068802 P 16 081431 P 19
LA SALLE 1 (BWR)
070788 P 17
LA SALLE 2 (BWR)
070788 P 17
LAKE
031698 P 3 075623 P 18
LEAD
065354 P 15
LEAK
045919 P 8
LEAK RATE
069713 P 17
LIMERICK 1 (BWR)
055883 P 11 057139 P 12
LIMERICK 2 (BWR)
055883 P 11 057139 P 12
LITHIUM
033201 P 3 058945 P 14
LITIGATION
066849 P 16
MAIN COOLING SYSTEM
021603 P 1 022680 P 1 030617 P 2 031698 P 3
032438 P 3 033201 P 3 037742 P 4 041123 P 5
042236 P 6 046276 P 9 047723 P 10 056228 P 11
057709 P 12 096601 P 21
MAINE YANKEE (PWR)
069648 P 16
MAN
077011 P 18 088495 P 20
MEASUREMENT
021603 P 1
MIDLAND 1 (PWR)
045877 P 8 045919 P 8 046027 P 9 066849 P 16
MIDLAND 2 (PWR)
045877 P 8 045919 P 8 046027 P 9
MILK
045390 P 8 056406 P 11
MONITOR
022680 P 1 057709 P 12 075623 P 18 076805 P 18
081014 P 19 091773 P 20
MONITOR, AREA
091773 P 20
MONITOR, ENVIRONMENTAL
046591 P 9
MONITOR, GAS
074864 P 18
MONITOR, LIQUID
014585 P 1 016514 P 1 037151 P 4 046276 P 9
058655 P 13 071896 P 17
MONITORING PROGRAM, ENVIRONMENTAL
065354 P 15
MONITORING SYSTEM, RADIATION
069648 P 16 091773 P 20
MONTICELLO (BWR)
022680 P 1 045127 P 7 045649 P 8
MORTALITY
065354 P 15
MPC
057868 P 13 058655 P 13 065892 P 15
N-POWER FORECAST
056477 P 12
NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)
066849 P 16
NBS
017924 P 1 069713 P 17
NEVADA TEST SITE
068802 P 16
NORTH ANNA 1 (PWR)
042236 P 6 042250 P 6 042251 P 6 042252 P 7

042253 P 7
NORTH ANNA 2 (PWR)
042236 P 6 042250 P 6 042251 P 6 042252 P 7
042253 P 7
NRC DESIGN CRITERIA
030610 P 2
NRC QUESTION
030494 P 2 030610 P 2
NRC REGULATORY GUIDE
077011 P 18
NUCLEAR DETONATION
074864 P 18
NUS
056406 P 11
OCEAN AND SEA
025191 P 2
OFF GAS
049779 P 10
OFF SITE
034797 P 3
OPERATING EXPERIENCE SUMMARY
014585 P 1
OPERATION
043647 P 7 072847 P 17
OPPONENT
066849 P 16
ORGANIZATION, CITIZEN
056460 P 12 066849 P 16
PALISADES (PWR)
037151 P 4 066849 P 16 072847 P 17
PEACH BOTTOM 1 (HTGR)
056477 P 12
PEACH BOTTOM 2 (BWR)
021603 P 1
PERSONNEL EXPOSURE, RADIATION
047723 P 10 056228 P 11
PHYSIOLOGY/METABOLISM
077011 P 18 088495 P 20
PHYTOPLANKTON
072847 P 17
PIPES AND PIPE FITTINGS
030610 P 2
PLOWSHARE
045390 P 8 074864 P 18
PLUTONIUM
068802 P 16
POINT BEACH 1 (PWR)
041759 P 6
POINT BEACH 2 (PWR)
041759 P 6
POISON, FIXED
045649 P 8
POLLUTION
056477 P 12
POLONIUM
065354 P 15
POPULATION EXPOSURE
045877 P 8 057868 P 13 058311 P 13 058655 P 13
058951 P 14 059547 P 15 065354 P 15 074864 P 18
077011 P 18 088495 P 20
POTASSIUM
065354 P 15
POWER PLANT, NUCLEAR
077011 P 18 088495 P 20
POWER TRANSMISSION
056477 P 12
PRESSURE VESSELS
030610 P 2
PRESSURE, INTERNAL
045649 P 8
PRODUCTION
055709 P 11 058311 P 13 059547 P 15 059661 P 15
096601 P 21
PRODUCTION, GROSS
057139 P 12
PRODUCTION, RATE
056228 P 11 058945 P 14 059476 P 14 060133 P 15
070788 P 17 071896 P 17 084179 P 19
PROPONENT
056477 P 12
PUBLIC HEARING
066849 P 16
QUAD CITIES 1 (BWR)
049779 P 10 058655 P 13 059661 P 15
QUAD CITIES 2 (BWR)
049779 P 10 058655 P 13 059661 P 15
RADIATION EFFECT
065354 P 15
RADIATION EFFECT, ECOSYSTEM
072847 P 17
RADIATION EXPOSURE
065354 P 15 090775 P 20
RADIATION IN PERSPECTIVE
065354 P 15 068802 P 16
RADIATION MONITORS
037151 P 4
RADIATION SAFETY AND CONTROL
031698 P 3 075623 P 18
RADIOACTIVITY RELEASE
030617 P 2 031698 P 3 042250 P 6 042251 P 6
042252 P 7 043647 P 7 045877 P 8 046027 P 9
055709 P 11 056406 P 11 058943 P 14 069648 P 16
069713 P 17 070788 P 17 078809 P 19
RADIOCHEMICAL PLANT SAFETY
056406 P 11
RADIOISOTOPE
045127 P 7 045287 P 8 046591 P 9
RADIOLOGICAL ASSISTANCE
075623 P 18
RADIOLYTIC GAS
030617 P 2 031698 P 3
RADIONUCLIDE TRANSFER
045390 P 8 068802 P 16
RADIONUCLIDE UPTAKE
045390 P 8 072847 P 17
RADIONUCLIDE, INDUCED
031698 P 3 058945 P 14
RAINOUT
034798 P 4
RATE
057139 P 12
REACTOR COOLANT
037742 P 4 069587 P 16
REACTOR SAFETY SYSTEM
030610 P 2
REACTOR, BWR
014585 P 1 021603 P 1 022680 P 1 030610 P 2
030617 P 2 031698 P 3 034797 P 3 034798 P 4
038486 P 4 041121 P 5 041123 P 5 041124 P 5
041125 P 5 041126 P 5 043647 P 7 045127 P 7
045649 P 8 049779 P 10 055709 P 11 057139 P 12
057868 P 13 058655 P 13 059547 P 15 059661 P 15
070788 P 17 071896 P 17 077011 P 18 079914 P 19
088495 P 20
REACTOR, GRAPHITE MODERATED
058943 P 14 058945 P 14 058951 P 14 060133 P 15
REACTOR, HTGR
058943 P 14 058945 P 14 058951 P 14 060133 P 15
REACTOR, HWR
016514 P 1 017924 P 1 069713 P 17
REACTOR, INTERNAL SUPERHEAT
030494 P 2
REACTOR, POWER
056477 P 12 065354 P 15 066849 P 16
REACTOR, PWR
025191 P 2 030494 P 2 032438 P 3 033201 P 3
033717 P 3 037151 P 4 037742 P 4 041335 P 6
041759 P 6 042236 P 6 042250 P 6 042251 P 6
042252 P 7 042253 P 7 045287 P 8 045877 P 8
045919 P 8 046027 P 9 046185 P 9 046276 P 9
046573 P 9 046591 P 9 046924 P 10 047723 P 10
049311 P 10 055527 P 11 057709 P 12 058116 P 13
058307 P 13 058311 P 13 059476 P 14 069587 P 16
069588 P 16 069648 P 16 070528 P 17 072847 P 17
076805 P 18 077011 P 18 078809 P 19 081014 P 19
081431 P 19 084179 P 19 088495 P 20 090772 P 20
090775 P 20 091773 P 20 096601 P 21
REACTOR, RESEARCH
016514 P 1 017924 P 1 065892 P 15 069713 P 17
REFUELING
032438 P 3 056228 P 11 090775 P 20
REGULATION, AEC
045877 P 8 049311 P 10 056406 P 11 058307 P 13
058311 P 13 059547 P 15 066849 P 16 075623 P 18
077011 P 18 088495 P 20
RELEASE RATE
038486 P 4 081431 P 19 084179 P 19
REPORT, ENVIRONMENTAL
045390 P 8 068802 P 16 072847 P 17 078809 P 19
REPORT, PSAR
014585 P 1 021603 P 1 022680 P 1 025191 P 2
030610 P 2 030617 P 2 031698 P 3 033717 P 3
034797 P 3 034798 P 4 037742 P 4 038486 P 4
042236 P 6 042250 P 6 042251 P 6 042252 P 7
042253 P 7 043647 P 7 046276 P 9 046924 P 10
057709 P 12 070528 P 17
REPORT, SAR
016514 P 1 017924 P 1 037151 P 4 041335 P 6
041759 P 6 045287 P 8 046591 P 9
RESIN
058951 P 14
RESOURCE, NATURAL

045390 P 8 074864 P 18
RESPONSE SPECTRUM
030610 P 2
RESPONSE TO NRC QUESTION
014585 P 1 016514 P 1 017924 P 1 021603 P 1
022680 P 1 025191 P 2 030617 P 2 031698 P 3
032438 P 3 033201 P 3 033717 P 3 034797 P 3
034798 P 4 037151 P 4 037742 P 4 038486 P 4
041121 P 5 041123 P 5 041124 P 5 041125 P 5
041126 P 5 041335 P 6 041759 P 6 042236 P 6
042250 P 6 042251 P 6 042252 P 7 042253 P 7
043647 P 7 045127 P 7 045287 P 8 045649 P 8
045877 P 8 045919 P 8 046027 P 9 046185 P 9
046276 P 9 046573 P 9 046591 P 9 046924 P 10
047723 P 10 049311 P 10 049779 P 10 055527 P 11
055709 P 11 055883 P 11 057139 P 12 057709 P 12
057868 P 13 058116 P 13 058307 P 13 058311 P 13
058655 P 13 058943 P 14 058945 P 14 058951 P 14
059476 P 14 059547 P 15 059661 P 15 060133 P 15
069587 P 16 069588 P 16 069648 P 16 070528 P 17
070788 P 17 071896 P 17 076805 P 18 078809 P 19
079914 P 19 081014 P 19 081431 P 19 084179 P 19
090772 P 20 090775 P 20 091773 P 20 096601 P 21
RIVER
025191 P 2
ROBINSON 2 (PWR)
046591 P 9 075623 P 18 078809 P 19
SAFETY ANALYSIS
056228 P 11
SAMPLING
041335 P 6 042251 P 6 045127 P 7 058655 P 13
SAN ONOFRE 2 (PWR)
058116 P 13
SAN ONOFRE 3 (PWR)
058116 P 13
SAXTON (PWR)
032438 P 3
SEISMOLOGY
045390 P 8 074864 P 18
SEQUOYAH 1 (PWR)
047723 P 10
SEQUOYAH 2 (PWR)
047723 P 10
SHOREHAM (BWR)
038486 P 4 043647 P 7 066849 P 16
SITING
075623 P 18
SITING, CHEMICAL PROCESS PLANT
056406 P 11 056460 P 12
SOCIO/PHILOSOPHICAL CONSIDERATION
056477 P 12
SPOKESMAN, INDUSTRY
056477 P 12
STACK
046924 P 10
STAFFING
069713 P 17
STATEMENT, ENVIRONMENTAL
074864 P 18 077011 P 18 088495 P 20
STEEL LINER
058945 P 14
STIMULATION
045390 P 8 074864 P 18
STORAGE CONTAINER
033717 P 3
STRONTIUM
056406 P 11 065354 P 15
SURFACE WATER, NUCLIDE OCCURRENCE
068802 P 16
SURRY 1 (PWR)
058307 P 13 058311 P 13
SURRY 2 (PWR)
058307 P 13 058311 P 13
SURVEY
066849 P 16
SYSTEM CAPABILITY
058655 P 13 079914 P 19
SYSTEM DESCRIPTION
058655 P 13
TECHNICAL SPECIFICATIONS
032438 P 3 065892 P 15 069713 P 17
TEST INTERVAL
045127 P 7
TEST, LEAK
066849 P 16
TEST, WEAPONS
066849 P 16
THERMAL POLLUTION
056460 P 12 072847 P 17
THREE MILE ISLAND 2 (PWR)
033717 P 3 037742 P 4
TITANIUM
058951 P 14
TRANSPORTATION AND HANDLING
090772 P 20
TRIGA (RR)
066849 P 16
TROJAN (PWR)
046276 P 9 057709 P 12
TURKEY POINT 3 (PWR)
045287 P 8 046573 P 9
TURKEY POINT 4 (PWR)
045287 P 8 046573 P 9
URANIUM
058307 P 13
VENTILATION SYSTEM
058943 P 14
VERMONT YANKEE (BWR)
066849 P 16
WASTE DISPOSAL
056406 P 11 081014 P 19 081431 P 19 090772 P 20
WASTE DISPOSAL, GAS
030494 P 2 030617 P 2 033717 P 3 041759 P 6
045877 P 8 046027 P 9 046924 P 10 049311 P 10
049779 P 10 057868 P 13 058951 P 14 059661 P 15
WASTE DISPOSAL, LAKE
025191 P 2 034797 P 3
WASTE DISPOSAL, LIQUID
014585 P 1 016514 P 1 030494 P 2 030617 P 2
037151 P 4 041124 P 5 041125 P 5 041126 P 5
041335 P 6 042250 P 6 042251 P 6 042252 P 7
042253 P 7 045127 P 7 045287 P 8 045877 P 8
046027 P 9 046276 P 9 046591 P 9 046924 P 10
049311 P 10 057709 P 12 057868 P 13 058116 P 13
058307 P 13 059476 P 14 059547 P 15 059661 P 15
065892 P 15 069588 P 16 071896 P 17 079914 P 19
WASTE DISPOSAL, RIVER
045127 P 7 046185 P 9
WASTE DISPOSAL, SOLID
058951 P 14
WASTE HANDLING
069648 P 16
WASTE HEAT, WATER
056477 P 12
WASTE MANAGEMENT
030494 P 2 030617 P 2 033717 P 3 037151 P 4
041121 P 5 041124 P 5 041125 P 5 041126 P 5
041335 P 6 041759 P 6 042250 P 6 042251 P 6
042252 P 7 042253 P 7 045287 P 8 045877 P 8
045919 P 8 046027 P 9 046185 P 9 046924 P 10
049311 P 10 056406 P 11 057139 P 12 058116 P 13
058307 P 13 058951 P 14 069648 P 16
WASTE SOURCE AND TYPE
041121 P 5 046573 P 9
WASTE TRANSPORTATION
090772 P 20
WASTE TREATMENT
079914 P 19
WASTE TREATMENT, EQUIPMENT
058951 P 14
WASTE TREATMENT, LIQUID
046573 P 9 058655 P 13 079914 P 19
WATER
042250 P 6 042251 P 6 042252 P 7 042253 P 7
065354 P 15
WATERFORD 3 (PWR)
076805 P 18
WELDING
030610 P 2
WPPSS 1 (PWR)
096601 P 21
X-RAY
065354 P 15
ZION 1 (PWR)
025191 P 2 069587 P 16 069588 P 16
ZION 2 (PWR)
069587 P 16 069588 P 16
ZOOPLANKTON
072847 P 17

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

LANDIS JW
056477 P 12
RUNION TC
056406 P 11
WEBSTER BH
075623 P 18

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN THE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE. * INDICATES END OF TITLE.)

TO QUESTION 11.3 - RADIOACTIVITY DISCHARGED TO RIVER -	ACCOUNTABILITY* #RESPONSE	046185	P 9
#RESPONSE TO QUESTION 11.3 - TRITIUM	ACCUMULATION*	096601	P 21
ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING	ACTION (HPIS/251)* #FINAL	077011	P 18
ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING	ACTION (HPIS/251)* #FINAL	088495	P 20
#RESPONSE TO QUESTION 2 - SPECIFICATIONS FOR COOLANT	ACTIVITY AND LEAKAGE*	032438	P 3
#SUPPLEMENT 3 TO PSAR -	ADDITIONAL INFORMATION TO AEC QUESTIONS IN SUPPLEMENT 1*	030610	P 2
#RESPONSE TO QUESTION 9.2 -	ADEQUACY OF SYSTEM FOR TREATING LIQUID RADWASTE*	058655	P 13
#WEEKLY ROUNDUP OF	AEC LICENSING MATERIAL - ALLIED-GULF NUCLEAR SERVICES*	056460	P 12
ANNUAL RELEASE OF RADIOACTIVE MATERIAL* #RESPONSE TO	AEC QUESTION 11.1 - ESTIMATE (ISOTOPIC BASIS) OF DAILY AND	049311	P 10
#SUPPLEMENT 3 TO PSAR - ADDITIONAL INFORMATION TO	AEC QUESTIONS IN SUPPLEMENT 1*	030610	P 2
INTERNALS, AND TABULATION OF LOCATION OF RESPONSES TO	AEC QUESTIONS* #WASTE HANDLING, VESSEL	030494	P 2
#PROBLEMS IN MEETING	AEC REPORTING AND COMPLIANCE REQUIREMENTS*	075623	P 18
AND INSPECTION, RADIATION OFFICE, ENVIRONMENTAL PROTECTION	AGENCY* BY SURVEILLANCE BRANCH, DIVISION OF SURVEILLANCE	065354	P 15
#RESPONSE TO QUESTION 2.6.4 - HYDROGEN AND TRITIUM IN	AIR EJECTOR EXHAUST*	049779	P 10
#WEEKLY ROUNDUP OF AEC LICENSING MATERIAL -	ALLIED-GULF NUCLEAR SERVICES*	056460	P 12
#RESPONSE TO QUESTION 11.1 - ESTIMATED	AMOUNTS OF RADIONUCLIDES RELEASED DAILY AND ANNUALLY*	046027	P 9
#QUESTION 10 -	ANALYSIS OF TRITIUM DOSES FROM HEAT EXCHANGER FAILURE*	017924	P 1
- ESTIMATED AMOUNTS OF RADIONUCLIDES RELEASED DAILY AND	ANNUALLY* #RESPONSE TO QUESTION 11.1	046027	P 9
#RESPONSE TO QUESTION S11.1B - TRITIUM	ASSAYS - TREATMENT LAGCONS*	042251	P 6
#SPEECH BY J. W. LANDIS, GULF GENERAL	ATOMIC*	056477	P 12
#RESPONSE TO AEC QUESTION 11.1 - ESTIMATE (ISOTOPIC	BASIS) OF DAILY AND ANNUAL RELEASE OF RADIOACTIVE MATERIAL*	049311	P 10
RESPONSE TO QUESTION 3.9 - DURABILITY OF CONTROL-ROD POISON	BLADE* #	045649	P 8
STATEMENT - RIO BLANCO GAS STIMULATION PROJECT, RIO	BLANCO COUNTY COLORADO* #ENVIRONMENTAL	074864	P 18
#PROJECT RIO	BLANCO ENVIRONMENTAL IMPACT EVALUATION*	045390	P 8
#ENVIRONMENTAL STATEMENT - RIO	BLANCO GAS STIMULATION PROJECT, RIO BLANCO COUNTY COLORADO*	074864	P 18
OFFICE, ENVIRONMENTAL #REPLY TO QUESTIONS BY SURVEILLANCE	BRANCH, DIVISION OF SURVEILLANCE AND INSPECTION, RADIATION	065354	P 15
#QUESTION 4.7 - TRITIUM	BUILDUP AND HAZARD*	022680	P 1
#THREE CHANGES TO TECH SPECS FOR NATIONAL	BUREAU OF STANDARDS REACTOR*	069713	P 17
#SPEECH BY T.	C. RUNION, PRES., NUCLEAR FUEL SERVICES*	056406	P 11
TO QUESTION 9.5.7 - TRITIUM CONCENTRATIONS - DISCHARGE	CANAL VS SOURCE OF WATER* #RESPONSE	041126	P 5
#RESONSE TO QUESTION 11.1A - TRITIUM RELEASES TO	CANAL*	042250	P 6
#RESPONSE TO QUESTION 2.8 - SAMPLING THE DISCHARGE	CANAL*	045127	P 7
9.5.6 - EVALUATION OF TRITIUM CONCENTRATIONS IN DISCHARGE	CANAL* #RESPONSE TO QUESTION	041125	P 5
#RESPONSE TO QUESTION J.4 -	CAPABILITIES OF THE WASTE PROCESSIVE SYSTEM*	079914	P 19
#RESPONSE TO QUESTION 11.2 - DISPOSAL OF	CERTAIN WASTES*	058951	P 14
#RESPONSE TO QUESTION 9.5.5 - TRITIUM/COOLANT/LIQUID-WASTE	CHAIN*	041124	P 5
#TECH-SPEC	CHANGE 9 GRANTED FOR MIT RESEARCH REACTOR*	065892	P 15
REACTOR* #THREE	CHANGES TO TECH SPECS FOR NATIONAL BUREAU OF STANDARDS	069713	P 17
- RIO BLANCO GAS STIMULATION PROJECT, RIO BLANCO COUNTY	COLORADO* #ENVIRONMENTAL STATEMENT	074864	P 18
#RESPONSE TO	COMMENT 2.17--TRITIUM*	031698	P 3
#PROBLEMS IN MEETING AEC REPORTING AND	COMPLIANCE REQUIREMENTS*	075623	P 18
#RESPONSE TO QUESTION 2.4C - TRITIUM AND IODINE	CONCENTRATION FOR DBA*	034798	P 4
#RESPONSE TO QUESTION 9.4 -	CONCENTRATION OF TRITIUM IN COOLING SYSTEM*	042236	P 6
#RESPONSE TO QUESTION 11.36 - COOLANT-TRITIUM	CONCENTRATION*	069587	P 16
#RESPONSE TO QUESTION 9.5.7 - TRITIUM	CONCENTRATIONS - DISCHARGE CANAL VS SOURCE OF WATER*	041126	P 5
#RESPONSE TO QUESTION 2.4B - TRITIUM AND IODINE	CONCENTRATIONS FROM DBA*	034797	P 3
#RESPONSE TO QUESTION 9.5.6 - EVALUATION OF TRITIUM	CONCENTRATIONS IN DISCHARGE CANAL*	041125	P 5
#RESPONSE TO QUESTION 11D - MONITORING TRITIUM	CONCENTRATIONS PRIOR TO DISCHARGE FROM STATION*	042253	P 7
#FINAL ENVIRONMENTAL STATEMENT	CONCERNING PROPOSED RULE MAKING ACTION (HPIS/251)*	088495	P 20
#FINAL ENVIRONMENTAL STATEMENT	CONCERNING PROPOSED RULE MAKING ACTION (HPIS/251)*	077011	P 18
#RESPONSE TO QUESTION 3.5E - HISTORY OF	CONTAINMENT PURGES*	078809	P 19
#RESPONSE TO QUESTION 11.4 - DETECTING TRITIUM WITHIN	CONTAINMENT*	076805	P 18
#RESPONSE TO QUESTION 9.3 - CONTROL OF TRITIUM	CONTAMINATION*	069648	P 16
#RESPONSE TO QUESTION 9.3 -	CONTROL OF TRITIUM CONTAMINATION*	069648	P 16
#RESPONSE TO QUESTION 12.6-A - TRITIUM GENERATION AND	CONTROL*	037742	P 4
#RESPONSE TO QUESTION 12.6-A - TRITIUM GENERATION AND	CONTROL*	033717	P 3
#RESPONSE TO QUESTION 3.9 - DURABILITY OF	CONTROL-ROD POISON BLADE*	045649	P 8
#RESPONSE TO QUESTION 7 - TRITIUM	CONTROLS*	030617	P 2
#RESPONSE TO QUESTION 2 - SPECIFICATIONS FOR	COOLANT ACTIVITY AND LEAKAGE*	032438	P 3
#RESPONSE TO QUESTION 2.7 - SECONDARY	COOLANT AND COOLING POND*	045919	P 8
TO QUESTION 14.6--PRODUCTION RATE OF TRITIUM IN PRIMARY	COOLANT* #RESPONSE	033201	P 3
TO QUESTION 9.5.4 - FRACTION OF TRITIUM RELEASED OF PRIMARY	COOLANT* #RESPONSE	041123	P 5
#RESPONSE TO QUESTION 11.36 -	COOLANT-TRITIUM CONCENTRATION*	069587	P 16
#RESPONSE TO QUESTION 2.7 - SECONDARY COOLANT AND	COOLING POND*	045919	P 8
#RESPONSE TO QUESTION 9.4 - TRITIUM IN MAIN	COOLING SYSTEM - HAZARD TO WORKERS*	047723	P 10
#RESPONSE TO QUESTION 9.4 - CONCENTRATION OF TRITIUM IN	COOLING SYSTEM*	042236	P 6
#RESPONSE TO QUESTION 9.12 - EFFECTS OF LIOH ON	COOLING WATER*	058945	P 14
STATEMENT - RIO BLANCO GAS STIMULATION PROJECT, RIO BLANCO	COUNTY COLORADO* #ENVIRONMENTAL	074864	P 18
#RESPONSE TO QUESTION 5-1 -	CURRENT TRITIUM LEVEL IN LAKE MICHIGAN*	025191	P 2

TO AEC QUESTION 11.1 - ESTIMATE (ISOTOPIC BASIS) OF	DAILY AND ANNUAL RELEASE OF RADIOACTIVE MATERIAL*#RESPONSE	049311 P 10
#RESPONSE TO QUESTION 11.1 - ESTIMATE OF	DAILY AND ANNUAL RELEASES OF RADIOACTIVITY*	045877 P 8
QUESTION 11.1 - ESTIMATED AMOUNTS OF RADIONUCLIDES RELEASED	DAILY AND ANNUALLY* #RESPONSE TO	046027 P 9
TO QUESTION 2.4B - TRITIUM AND IODINE CONCENTRATIONS FROM	DBA* #RESPONSE	034797 P 3
TO QUESTION 2.4C - TRITIUM AND IODINE CONCENTRATION FOR	DBA* #RESPONSE	034798 P 4
#RESPONSE TO QUESTION 11.4 -	DETECTING TRITIUM WITHIN CONTAINMENT*	076805 P 18
#PENDING DOCKET	DIGEST OF OCTOBER 28*	066849 P 16
#RESPONSE TO QUESTION 9.5.7 - TRITIUM CONCENTRATIONS -	DISCHARGE CANAL VS SOURCE OF WATER*	041126 P 5
#RESPONSE TO QUESTION 2.8 - SAMPLING THE	DISCHARGE CANAL*	045127 P 7
TO QUESTION 9.5.6 - EVALUATION OF TRITIUM CONCENTRATIONS IN	DISCHARGE CANAL* #RESPONSE	041125 P 5
QUESTION 11D - MONITORING TRITIUM CONCENTRATIONS PRIOR TO	DISCHARGE FROM STATION* #RESPONSE TO	042253 P 7
#QUESTION F.3 - ESTIMATE AND JUSTIFY TRITIUM	DISCHARGE IN LIQUID*	014585 P 1
#RESPONSE TO QUESTION 11.12 - TRITIUM PRODUCTION AND	DISCHARGE*	084179 P 19
#RESPONSE TO QUESTION 11.3 - RADIOACTIVITY	DISCHARGED TO RIVER - ACCOUNTABILITY*	046185 P 9
#RESPONSE TO QUESTION 11.2 -	DISPOSAL OF CERTAIN WASTES*	058951 P 14
#RESPONSE TO QUESTION 11.1 -	DISPOSAL OF RADWASTE, GASEOUS AND LIQUID*	046924 P 10
#RESPONSE TO QUESTION 11.37 - TRITIUM	DISPOSAL*	069588 P 16
ENVIRONMENTAL #REPLY TO QUESTIONS BY SURVEILLANCE BRANCH,	DIVISION OF SURVEILLANCE AND INSPECTION, RADIATION OFFICE,	065354 P 15
#PENDING	DOCKET DIGEST OF OCTOBER 28*	066849 P 16
#QUESTION 10 - ANALYSIS OF TRITIUM	DOSES FROM HEAT EXCHANGER FAILURE*	017924 P 1
#RESPONSE TO QUESTION 3.9 -	DURABILITY OF CONTROL-ROD POISON BLADE*	045649 P 8
#RESPONSE TO QUESTION 12.10 - EXPOSURE	DURING REFUELING*	090775 P 20

#RESPONSE TO QUESTION 9.12 -	EFFECTS OF LIOH ON COOLING WATER*	058945 P 14
#RESPONSE TO QUESTION 11.1C - TRITIUM - RECYCLING	EFFECTS*	042252 P 7
TO QUESTION 1E - IDENTIFYING RADIOISOTOPES IN LIQUID	EFFLUENTS* #RESPONSE	046591 P 9
#RESPONSE TO QUESTION 2.6.4 - HYDROGEN AND TRITIUM IN AIR	EJECTOR EXHAUST*	049779 P 10
#RESPONSE TO QUESTION 8.5 -	EMERGENCY POWER TO SAFETY FEATURES*	043647 P 7
#PROJECT RIO BLANCO	ENVIRONMENTAL IMPACT EVALUATION*	045390 P 8
#	ENVIRONMENTAL IMPACT OF PLANT OPERATION UP TO JULY 1, 1972*	072847 P 17
DIVISION OF SURVEILLANCE AND INSPECTION, RADIATION OFFICE,	ENVIRONMENTAL PROTECTION AGENCY* BY SURVEILLANCE BRANCH,	065354 P 15
PROJECT, RIO BLANCO COUNTY COLORADO* #	ENVIRONMENTAL STATEMENT - RIO BLANCO GAS STIMULATION	074864 P 18
ACTION (HPIS/251)* #FINAL	ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING	088495 P 20
ACTION (HPIS/251)* #FINAL	ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING	077011 P 18
#	ENVIRONMENTAL STATEMENT, UNDERGROUND NUCLEAR TEST PROGRAMS*	068802 P 16
RADIOACTIVE MATERIAL* #RESPONSE TO AEC QUESTION 11.1 -	ESTIMATE (ISOTOPIC BASIS) OF DAILY AND ANNUAL RELEASE OF	049311 P 10
#QUESTION F.3 -	ESTIMATE AND JUSTIFY TRITIUM DISCHARGE IN LIQUID*	014585 P 1
#RESPONSE TO QUESTION 11.1 -	ESTIMATE OF DAILY AND ANNUAL RELEASES OF RADIOACTIVITY*	045877 P 8
ANNUALLY* #RESPONSE TO QUESTION 11.1 -	ESTIMATED AMOUNTS OF RADIONUCLIDES RELEASED DAILY AND	046027 P 9
#RESPONSE TO QUESTION 9.3 - TRITIUM -	ESTIMATED RATE OF PRODUCTION*	057139 P 12
TO QUESTION 11.2 - ANNUAL RELEASES OF LIQUID WASTES (	ESTIMATED)* #RESPONSE	058307 P 13
#RESPONSE TO QUESTION 9.5.6 -	EVALUATION OF TRITIUM CONCENTRATIONS IN DISCHARGE CANAL*	041125 P 5
#PROJECT RIO BLANCO ENVIRONMENTAL IMPACT	EVALUATION*	045390 P 8
#QUESTION 10 - ANALYSIS OF TRITIUM DOSES FROM HEAT	EXCHANGER FAILURE*	017924 P 1
TO QUESTION 2.6.4 - HYDROGEN AND TRITIUM IN AIR EJECTOR	EXHAUST* #RESPONSE	049779 P 10
#RESPONSE TO QUESTION 12.10 -	EXPOSURE DURING REFUELING*	090775 P 20

#QUESTION	F.3 - ESTIMATE AND JUSTIFY TRITIUM DISCHARGE IN LIQUID*	014585 P 1
#RESPONSE TO QUESTION 9.10 -	FAILURE OF SYSTEM TO PURIFY HELIUM*	058943 P 14
QUESTION 10 - ANALYSIS OF TRITIUM DOSES FROM HEAT EXCHANGER	FAILURE* #	017924 P 1
#RESPONSE TO QUESTION 8.5 - EMERGENCY POWER TO SAFETY	FEATURES*	043647 P 7
MAKING ACTION (HPIS/251)* #	FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE	077011 P 18
MAKING ACTION (HPIS/251)* #	FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE	088495 P 20
#RESPONSE TO QUESTION 9.5.4 -	FRACTION OF TRITIUM RELEASED OF PRIMARY COOLANT*	041123 P 5
#SPEECH BY T. C. RUNION, PRES., NUCLEAR	FUEL SERVICES*	056406 P 11

#ENVIRONMENTAL STATEMENT - RIO BLANCO	GAS STIMULATION PROJECT, RIO BLANCO COUNTY COLORADO*	074864 P 18
#RESPONSE TO QUESTION 11.1 - DISPOSAL OF RADWASTE,	GASEOUS AND LIQUID*	046924 P 10
#SPEECH BY J. W. LANDIS, GULF	GENERAL ATOMIC*	056477 P 12
#RESPONSE TO QUESTION 12.6-A - TRITIUM	GENERATION AND CONTROL*	037742 P 4
#RESPONSE TO QUESTION 12.6-A - TRITIUM	GENERATION AND CONTROL*	033717 P 3
#RESPONSE TO QUESTION 2.11 - TRITIUM	GENERATION RATE AND PROTECTION OF PERSONNEL*	056228 P 11
#RESPONSE TO QUESTION 11.4 - TRITIUM -	GENERATION, RELEASE, MONITORING*	057709 P 12
#TECH-SPEC CHANGE 9	GRANTED FOR MIT RESEARCH REACTOR*	065892 P 15
#SPEECH BY J. W. LANDIS,	GULF GENERAL ATOMIC*	056477 P 12
#WEEKLY ROUNDUP OF AEC LICENSING MATERIAL - ALLIED-	GULF NUCLEAR SERVICES*	056460 P 12

RESPONSES TO AEC QUESTIONS* #WASTE	HANDLING, VESSEL INTERNALS, AND TABULATION OF LOCATION OF	030494 P 2
RESPONSE TO QUESTION 9.4 - TRITIUM IN MAIN COOLING SYSTEM -	HAZARD TO WORKERS* #	047723 P 10
#QUESTION 4.7 - TRITIUM BUILDUP AND	HAZARD*	022680 P 1
#QUESTION 10 - ANALYSIS OF TRITIUM DOSES FROM	HEAT EXCHANGER FAILURE*	017924 P 1
#RESPONSE TO QUESTION 9.10 - FAILURE OF SYSTEM TO PURIFY	HELIUM*	058943 P 14
#RESPONSE TO QUESTION 3.5E -	HISTORY OF CONTAINMENT PURGES*	078809 P 19
STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (	HPIS/251)* #FINAL ENVIRONMENTAL	077011 P 18
STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (	HPIS/251)* #FINAL ENVIRONMENTAL	088495 P 20
#RESPONSE TO QUESTION 2.6.4 -	HYDROGEN AND TRITIUM IN AIR EJECTOR EXHAUST*	049779 P 10

#RESPONSE TO QUESTION IE - IDENTIFYING RADIOISOTOPES IN LIQUID EFFLUENTS* 046591 P 9
#RESPONSE TO QUESTION IE - IDENTIFYING RADIOISOTOPES IN LIQUID EFFLUENTS* 046591 P 9
#PROJECT RIO BLANCO ENVIRONMENTAL IMPACT EVALUATION* 045390 P 8
#ENVIRONMENTAL IMPACT OF PLANT OPERATION UP TO JULY 1, 1972* 072847 P 17
#SUPPLEMENT 3 TO PSAR - ADDITIONAL INFORMATION TO AEC QUESTIONS IN SUPPLEMENT 1* 030610 P 2
BY SURVEILLANCE BRANCH, DIVISION OF SURVEILLANCE AND INSPECTION, RADIATION OFFICE, ENVIRONMENTAL PROTECTION 065354 P 15
QUESTIONS* #WASTE HANDLING, VESSEL INTERNALS, AND TABULATION OF LOCATION OF RESPONSES TO AEC 030494 P 2
#RESPONSE TO QUESTION 2.4C - TRITIUM AND IODINE CONCENTRATION FOR DBA* 034798 P 4
#RESPONSE TO QUESTION 2.4B - TRITIUM AND IODINE CONCENTRATIONS FROM DBA* 034797 P 3
MATERIAL* #RESPONSE TO AEC QUESTION 11.1 - ESTIMATE (ISOTOPIC BASIS) OF DAILY AND ANNUAL RELEASE OF RADIOACTIVE 049311 P 10

#SPEECH BY J. W. LANDIS, GULF GENERAL ATOMIC* 056477 P 12
#RESPONSE TO QUESTION J.4 - CAPABILITIES OF THE WASTE PROCESSIVE SYSTEM* 079914 P 19
#QUESTION F.3 - ESTIMATE AND JUSTIFY TRITIUM DISCHARGE IN LIQUID* 014585 P 1

#RESPONSE TO QUESTION 11.21 - RELEASES OF TRITIUM AND KRYPTON-85* 081431 P 19

#RESPONSE TO QUESTION S11.18 - TRITIUM ASSAYS - TREATMENT LAGOONS* 042251 P 6
#RESPONSE TO QUESTION 5-1 - CURRENT TRITIUM LEVEL IN LAKE MICHIGAN* 025191 P 2
#SPEECH BY J. W. LANDIS, GULF GENERAL ATOMIC* 056477 P 12
TO QUESTION 2 - SPECIFICATIONS FOR COOLANT ACTIVITY AND LEAKAGE* #RESPONSE 032438 P 3
#RESPONSE TO QUESTION 5-1 - CURRENT TRITIUM LEVEL IN LAKE MICHIGAN* 025191 P 2
#WEEKLY ROUNDUP OF AEC LICENSING MATERIAL - ALLIED-GULF NUCLEAR SERVICES* 056460 P 12
#RESPONSE TO QUESTION 9.2 - TRITIUM-RELEASE LIMITS* 041759 P 6
#RESPONSE TO QUESTION 9.12 - EFFECTS OF LIOH ON COOLING WATER* 058945 P 14
#RESPONSE TO QUESTION IE - IDENTIFYING RADIOISOTOPES IN LIQUID EFFLUENTS* 046591 P 9
#RESPONSE TO QUESTION 11.5 - SAMPLING TRITIUM (LIQUID RADWASTE SYSTEM* 041335 P 6
#RESPONSE TO QUESTION 9.2 - ADEQUACY OF SYSTEM FOR TREATING LIQUID RADWASTE* 058655 P 13
#QUESTION 17 - RADIATION MONITOR RD4-3 IN LIQUID WASTE SYSTEM.* 016514 P 1
TO QUESTION 11.2 - TRITIUM AND OTHER RADIOACTIVITY IN LIQUID WASTE* #RESPONSE 046573 P 9
#RESPONSE TO QUESTION 11.2 - ANNUAL RELEASES OF LIQUID WASTES (ESTIMATED)* 058307 P 13
#RESPONSE TO QUESTION 11.2 - LIQUID WASTES* 045287 P 8
#QUESTION F.3 - ESTIMATE AND JUSTIFY TRITIUM DISCHARGE IN LIQUID* 014585 P 1
TO QUESTION 11.1 - DISPOSAL OF RADWASTE, GASEOUS AND LIQUID* #RESPONSE 046924 P 10
#WASTE HANDLING, VESSEL INTERNALS, AND TABULATION OF LOCATION OF RESPONSES TO AEC QUESTIONS* 030494 P 2

#RESPONSE TO QUESTION 9.4 - TRITIUM IN MAIN COOLING SYSTEM - HAZARD TO WORKERS* 047723 P 10
#FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (HPIS/251)* 077011 P 18
#FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (HPIS/251)* 088495 P 20
#RESPONSE TO QUESTION 1.8-1518 - MANAGEMENT OF TRITIUM* 058116 P 13
#WEEKLY ROUNDUP OF AEC LICENSING MATERIAL - ALLIED-GULF NUCLEAR SERVICES* 056460 P 12
(ISOTOPIC BASIS) OF DAILY AND ANNUAL RELEASE OF RADIOACTIVE MATERIAL* #RESPONSE TO AEC QUESTION 11.1 - ESTIMATE 049311 P 10
#PROBLEMS IN MEETING AEC REPORTING AND COMPLIANCE REQUIREMENTS* 075623 P 18
#RESPONSE TO QUESTION 5-1 - CURRENT TRITIUM LEVEL IN LAKE MICHIGAN* 025191 P 2
#TECH-SPEC CHANGE 9 GRANTED FOR MIT RESEARCH REACTOR* 065892 P 15
#QUESTION 17 - RADIATION MONITOR RD4-3 IN LIQUID WASTE SYSTEM.* 016514 P 1
STATION* #RESPONSE TO QUESTION 11D - MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM 042253 P 7
#RESPONSE TO QUESTION 11.4 - TRITIUM - GENERATION, RELEASE, MONITORING* 057709 P 12
#RESPONSE TO QUESTION 11.7.3 - TRITIUM MONITORING* 081014 P 19
#RESPONSE TO QUESTION 12.2.4 - TRITIUM MONITORING* 091773 P 20

#THREE CHANGES TO TECH SPECS FOR NATIONAL BUREAU OF STANDARDS REACTOR* 069713 P 17
#SPEECH BY T. C. RUNION, PRES., NUCLEAR FUEL SERVICES* 056406 P 11
#WEEKLY ROUNDUP OF AEC LICENSING MATERIAL - ALLIED-GULF NUCLEAR SERVICES* 056460 P 12
#ENVIRONMENTAL STATEMENT, UNDERGROUND NUCLEAR TEST PROGRAMS* 068802 P 16

BRANCH, DIVISION OF SURVEILLANCE AND INSPECTION, RADIATION OFFICE, ENVIRONMENTAL PROTECTION AGENCY* BY SURVEILLANCE 065354 P 15
#ENVIRONMENTAL IMPACT OF PLANT OPERATION UP TO JULY 1, 1972* 072847 P 17
#QUESTION 4.2--PRODUCTION RATE OF TRITIUM FROM ROUTINE OPERATION* 021603 P 1
#RESPONSE TO QUESTION 11.2 - TRITIUM AND OTHER RADIOACTIVITY IN LIQUID WASTE* 046573 P 9

PENDING DOCKET DIGEST OF OCTOBER 28* 066849 P 16
QUESTION 2.11 - TRITIUM GENERATION RATE AND PROTECTION OF PERSONNEL* #RESPONSE TO 056228 P 11
#ENVIRONMENTAL IMPACT OF PLANT OPERATION UP TO JULY 1, 1972* 072847 P 17
#RESPONSE TO QUESTION 3.9 - DURABILITY OF CONTROL-ROD POISON BLADE* 045649 P 8
#RESPONSE TO QUESTION 2.7 - SECONDARY COOLANT AND COOLING POND* 045919 P 8
#RESPONSE TO QUESTION 8.5 - EMERGENCY POWER TO SAFETY FEATURES* 043647 P 7

#SPEECH BY T. C. RUNION,	PRES., NUCLEAR FUEL SERVICES*		056406 P 11
#RESPONSE TO QUESTION 14.6--PRODUCTION RATE OF TRITIUM IN	PRIMARY COOLANT*		033201 P 3
TO QUESTION 9.5.4 - FRACTICN OF TRITIUM RELEASED OF	PRIMARY COOLANT*	#RESPONSE	041123 P 5
TO QUESTION 11D - MONITORING TRITIUM CONCENTRATIONS	PRIOR TO DISCHARGE FROM STATION*	#RESPONSE	042253 P 7
REQUIREMENTS*	# PROBLEMS IN MEETING AEC REPORTING AND COMPLIANCE		075623 P 18
#RESPONSE TO QUESTION J.4 - CAPABILITIES OF THE WASTE	PROCESSIVE SYSTEM*		079914 P 19
#RESPONSE TO QUESTION 10.3 - TRITIUM	PRODUCED AND RELEASED*		057868 P 13
#RESPONSE TO QUESTION 11.12 - TRITIUM	PRODUCTION AND DISCHARGE*		084179 P 19
#RESPONSE TO QUESTION 9.4 - TRITIUM	PRODUCTION AND RELEASE*		071896 P 17
#QUESTION 4.2--	PRODUCTION RATE OF TRITIUM FROM ROUTINE OPERATION*		021603 P 1
#RESPONSE TO QUESTION 14.6--	PRODUCTION RATE OF TRITIUM IN PRIMARY COOLANT*		033201 P 3
#RESPONSE TO QUESTION 11.4 - TRITIUM -	PRODUCTION RATE*		060133 P 15
#RESPONSE TO QUESTION 9.7 - TRITIUM	PRODUCTION*		070528 P 17
#RESPONSE TO QUESTION 11.5 - TRITIUM	PRODUCTION*		055527 P 11
#RESPONSE TO QUESTION 11.6 - TRITIUM	PRODUCTION*		058311 P 13
#RESPONSE TO QUESTION 9.3 - TRITIUM - ESTIMATED RATE OF	PRODUCTION*		057139 P 12
#RESPONSE TO QUESTION 9.5.2-1 - SOURCES OF TRITIUM	PRODUCTION*		041121 P 5
#ENVIRONMENTAL STATEMENT. UNDERGROUND NUCLEAR TEST	PROGRAMS*		068802 P 16
#	PROJECT RIO BLANCO ENVIRONMENTAL IMPACT EVALUATION*		045390 P 8
#ENVIRONMENTAL STATEMENT - RIO BLANCO GAS STIMULATION	PROJECT, RIO BLANCO COUNTY COLORADO*		074864 P 18
#FINAL ENVIRONMENTAL STATEMENT CONCERNING	PROPOSED RULE MAKING ACTION (HPIS/251)*		077011 P 18
#FINAL ENVIRONMENTAL STATEMENT CONCERNING	PROPOSED RULE MAKING ACTION (HPIS/251)*		088495 P 20
AND INSPECTION, RADIATION OFFICE, ENVIRONMENTAL	PROTECTION AGENCY* BRANCH, DIVISION OF SURVEILLANCE		065354 P 15
#RESPONSE TO QUESTION 2.11 - TRITIUM GENERATION RATE AND	PROTECTION OF PERSONNEL*		056228 P 11
SUPPLEMENT 1* #SUPPLEMENT 3 TO	PSAR - ADDITIONAL INFORMATION TO AEC QUESTIONS IN		030610 P 2
#RESPONSE TO QUESTION 3.5E - HISTCRY OF CONTAINMENT	PURGES*		078809 P 19
#RESPONSE TO QUESTION 9.10 - FAILURE OF SYSTEM TO	PURIFY HELIUM*		058943 P 14

LIQUID*	# QUESTION F.3 - ESTIMATE AND JUSTIFY TRITIUM DISCHARGE IN		014585 P 1
*	#RESPONSE TO QUESTION IE - IDENTIFYING RADIOISOTOPES IN LIQUID EFFLUENTS		046591 P 9
	#RESPONSE TO QUESTION J.4 - CAPABILITIES OF THE WASTE PROCESSIVE SYSTEM*		079914 P 19
	#RESPONSE TO QUESTION S11.1B - TRITIUM ASSAYS - TREATMENT LAGOONS*		042251 P 6
	#RESPONSE TO QUESTION 1.8-151B - MANAGEMENT OF TRITIUM*		058116 P 13
EXCHANGER FAILURE*	# QUESTION 10 - ANALYSIS OF TRITIUM DOSES FROM HEAT		017924 P 1
	#RESPONSE TO QUESTION 10.3 - TRITIUM PRODUCED AND RELEASED*		057868 P 13
	#RESPONSE TO QUESTION 10.3 - TRITIUM*		059547 P 15
	#RESPONSE TO QUESTION 11.1 - DISPOSAL OF RADWASTE, GASEOUS AND LIQUID*		046924 P 10
ANNUAL RELEASE OF RADIOACTIVE MATERIAL*	#RESPONSE TO AEC QUESTION 11.1 - ESTIMATE (ISOTOPIC BASIS) OF DAILY AND		049311 P 10
RADIOACTIVITY*	#RESPONSE TO QUESTION 11.1 - ESTIMATE OF DAILY AND ANNUAL RELEASES OF		045877 P 8
RELEASED DAILY AND ANNUALLY*	#RESPONSE TO QUESTION 11.1 - ESTIMATED AMOUNTS OF RADIONUCLIDES		046027 P 9
	#RESONSE TO QUESTION 11.1A - TRITIUM RELEASES TO CANAL*		042250 P 6
	#RESPONSE TO QUESTION 11.1C - TRITIUM - RECYCLING EFFECTS*		042252 P 7
	#RESPONSE TO QUESTION 11.12 - TRITIUM PRODUCTION AND DISCHARGE*		084179 P 19
	#RESPONSE TO QUESTION 11.15 - TRITIUM SHIPMENT*		090772 P 20
ESTIMATED)*	#RESPONSE TO QUESTION 11.2 - ANNUAL RELEASES OF LIQUID WASTES (		058307 P 13
	#RESPONSE TO QUESTION 11.2 - DISPOSAL OF CERTAIN WASTES*		058951 P 14
	#RESPONSE TO QUESTION 11.2 - LIQUID WASTES*		045287 P 8
WASTE*	#RESPONSE TO QUESTION 11.2 - TRITIUM AND OTHER RADIOACTIVITY IN LIQUID		046573 P 9
	#RESPONSE TO QUESTION 11.21 - RELEASES OF TRITIUM AND KRYPTON-85*		081431 P 19
ACCOUNTABILITY*	#RESPONSE TO QUESTION 11.3 - RADIOACTIVITY DISCHARGED TO RIVER -		046185 P 9
	#RESPONSE TO QUESTION 11.3 - TRITIUM ACCUMULATION*		096601 P 21
	#RESPONSE TO QUESTION 11.3 - TRITIUM SAMPLING*		037151 P 4
	#RESPONSE TO QUESTION 11.36 - COOLANT-TRITIUM CONCENTRATION*		069587 P 16
	#RESPONSE TO QUESTION 11.37 - TRITIUM DISPOSAL*		069588 P 16
	#RESPONSE TO QUESTION 11.4 - DETECTING TRITIUM WITHIN CONTAINMENT*		076805 P 18
	#RESPONSE TO QUESTION 11.4 - TRITIUM - GENERATION, RELEASE, MONITORING*		057709 P 12
	#RESPONSE TO QUESTION 11.4 - TRITIUM - PRODUCTION RATE*		060133 P 15
	#RESPONSE TO QUESTION 11.4 - TRITIUM*		059476 P 14
	#RESPONSE TO QUESTION 11.4 - TRITIUM*		046276 P 9
	#RESPONSE TO QUESTION 11.5 - SAMPLING TRITIUM (LIQUID RADWASTE SYSTEM*		041335 P 6
	#RESPONSE TO QUESTION 11.5 - TRITIUM PRODUCTION*		055527 P 11
	#RESPONSE TO QUESTION 11.6 - TRITIUM PRODUCTION*		058311 P 13
	#RESPONSE TO QUESTION 11.7.3 - TRITIUM MONITORING*		081014 P 19
DISCHARGE FROM STATION*	#RESPONSE TO QUESTION 11D - MONITORING TRITIUM CONCENTRATIONS PRIOR TO		042253 P 7
	#RESPONSE TO QUESTION 12.10 - EXPOSURE DURING REFUELING*		090775 P 20
	#RESPONSE TO QUESTION 12.2.4 - TRITIUM MONITORING*		091773 P 20
	#RESPONSE TO QUESTION 12.6-A - TRITIUM GENERATION AND CONTROL*		037742 P 4
	#RESPONSE TO QUESTION 12.6-A - TRITIUM GENERATION AND CONTROL*		033717 P 3
COOLANT*	#RESPONSE TO QUESTION 14.6--PRODUCTION RATE OF TRITIUM IN PRIMARY		033201 P 3
SYSTEM.*	# QUESTION 17 - RADIATION MONITOR RD4-3 IN LIQUID WASTE		016514 P 1
LEAKAGE*	#RESPONSE TO QUESTION 2 - SPECIFICATIONS FOR COOLANT ACTIVITY AND		032438 P 3
PERSONNEL*	#RESPONSE TO QUESTION 2.11 - TRITIUM GENERATION RATE AND PROTECTION OF		056228 P 11
	#RESPONSE TO QUESTION 2.4B - TRITIUM AND IODINE CONCENTRATIONS FROM DBA*		034797 P 3
	#RESPONSE TO QUESTION 2.4C - TRITIUM AND IODINE CONCENTRATION FOR DBA*		034798 P 4
EXHAUST*	#RESPONSE TO QUESTION 2.6.4 - HYDROGEN AND TRITIUM IN AIR EJECTOR		049779 P 10
	#RESPONSE TO QUESTION 2.7 - SECONDARY COOLANT AND COOLING POND*		045919 P 8
	#RESPONSE TO QUESTION 2.8 - SAMPLING THE DISCHARGE CANAL*		045127 P 7
	#RESPONSE TO QUESTION 3.5E - HISTORY OF CONTAINMENT PURGES*		078809 P 19
	#RESPONSE TO QUESTION 3.9 - DURABILITY OF CONTROL-ROD POISON BLADE*		045649 P 8
OPERATION*	# QUESTION 4.2--PRODUCTION RATE OF TRITIUM FROM ROUTINE		021603 P 1
	# QUESTION 4.7 - TRITIUM BUILDUP AND HAZARD*		022680 P 1
	#RESPONSE TO QUESTION 5-1 - CURRENT TRITIUM LEVEL IN LAKE MICHIGAN*		025191 P 2
	#RESPONSE TO QUESTION 7 - TRITIUM CONTROLS*		030617 P 2
	#RESPONSE TO QUESTION 8.5 - EMERGENCY POWER TO SAFETY FEATURES*		043647 P 7
	#RESPONSE TO QUESTION 9.10 - FAILURE OF SYSTEM TO PURIFY HELIUM*		058943 P 14

	#RESPONSE TO	QUESTION 9.12 - EFFECTS OF LIOH ON COOLING WATER*	058945 P 16
RADWASTE*	#RESPONSE TO	QUESTION 9.2 - ADEQUACY OF SYSTEM FOR TREATING LIQUID	058655 P 13
	#RESPONSE TO	QUESTION 9.2 - TRITIUM*	059661 P 15
	#RESPONSE TO	QUESTION 9.2 - TRITIUM-RELEASE LIMITS*	041759 P 6
	#RESPONSE TO	QUESTION 9.3 - CONTROL OF TRITIUM CONTAMINATION*	069648 P 16
	#RESPONSE TO	QUESTION 9.3 - TRITIUM - ESTIMATED RATE OF PRODUCTION*	057139 P 12
	#RESPONSE TO	QUESTION 9.3 - TRITIUM*	055709 P 11
	#RESPONSE TO	QUESTION 9.4 - CONCENTRATION OF TRITIUM IN COOLING SYSTEM*	042236 P 6
WORKERS*	#RESPONSE TO	QUESTION 9.4 - TRITIUM IN MAIN COOLING SYSTEM - HAZARD TO	047723 P 10
	#RESPONSE TO	QUESTION 9.4 - TRITIUM PRODUCTION AND RELEASE*	071896 P 17
	#RESPONSE TO	QUESTION 9.5.2-1 - SOURCES OF TRITIUM PRODUCTION*	041121 P 5
COOLANT*	#RESPONSE TO	QUESTION 9.5.4 - FRACTION OF TRITIUM RELEASED OF PRIMARY	041123 P 5
	#RESPONSE TO	QUESTION 9.5.5 - TRITIUM/COOLANT/LIQUID-WASTE-CHAIN*	041124 P 5
DISCHARGE CANAL*	#RESPONSE TO	QUESTION 9.5.6 - EVALUATION OF TRITIUM CONCENTRATIONS IN	041125 P 5
VS SOURCE OF WATER*	#RESPONSE TO	QUESTION 9.5.7 - TRITIUM CONCENTRATIONS - DISCHARGE CANAL	041126 P 5
	#RESPONSE TO	QUESTION 9.6 - TRITIUM RELEASE RATE*	038486 P 4
	#RESPONSE TO	QUESTION 9.6 - TRITIUM RELEASE*	070788 P 17
	#RESPONSE TO	QUESTION 9.7 - TRITIUM PRODUCTION*	070528 P 17
	#RESPONSE TO	QUESTION 9.7 - TRITIUM*	055883 P 11
AND INSPECTION, RADIATION OFFICE, ENVIRONMENTAL	#REPLY TO	QUESTIONS BY SURVEILLANCE BRANCH, DIVISION OF SURVEILLANCE	065354 P 15
#SUPPLEMENT 3 TO PSAR - ADDITIONAL INFORMATION TO AEC		QUESTIONS IN SUPPLEMENT 1*	030610 P 2
INTERNALS, AND TABULATION OF LOCATION OF RESPONSES TO AEC		QUESTIONS* #WASTE HANDLING, VESSEL	030494 P 2

	#QUESTION 17 -	RADIATION MONITOR RD4-3 IN LIQUID WASTE SYSTEM.*	016514 P 1
BRANCH, DIVISION OF SURVEILLANCE AND INSPECTION,		RADIATION OFFICE, ENVIRONMENTAL PROTECTION AGENCY*	065354 P 15
- ESTIMATE (ISOTOPIC BASIS) OF DAILY AND ANNUAL RELEASE OF		RADIOACTIVE MATERIAL* #RESPONSE TO AEC QUESTION 11.1	049311 P 10
	#RESPONSE TO QUESTION 11.3 -	RADIOACTIVITY DISCHARGED TO RIVER - ACCOUNTABILITY*	046185 P 9
#RESPONSE TO QUESTION 11.2 - TRITIUM AND OTHER		RADIOACTIVITY IN LIQUID WASTE*	046573 P 9
TO QUESTION 11.1 - ESTIMATE OF DAILY AND ANNUAL RELEASES OF		RADIOACTIVITY* #RESPONSE	045877 P 8
#RESPONSE TO QUESTION IE - IDENTIFYING		RADIOISOTOPES IN LIQUID EFFLUENTS*	046591 P 9
#RESPONSE TO QUESTION 11.1 - ESTIMATED AMOUNTS OF		RADIONUCLIDES RELEASED DAILY AND ANNUALLY*	046027 P 9
#RESPONSE TO QUESTION 11.5 - SAMPLING TRITIUM (LIQUID		RADWASTE SYSTEM*	041335 P 6
TO QUESTION 9.2 - ADEQUACY OF SYSTEM FOR TREATING LIQUID		RADWASTE* #RESPONSE	058655 P 13
#RESPONSE TO QUESTION 11.1 - DISPOSAL OF		RADWASTE, GASEOUS AND LIQUID*	046924 P 10
#RESPONSE TO QUESTION 2.11 - TRITIUM GENERATION		RATE AND PROTECTION OF PERSONNEL*	056228 P 11
#RESPONSE TO QUESTION 9.3 - TRITIUM - ESTIMATED		RATE OF PRODUCTION*	057139 P 12
#QUESTION 4.2--PRODUCTION		RATE OF TRITIUM FROM ROUTINE OPERATION*	021603 P 1
#RESPONSE TO QUESTION 14.6--PRODUCTION		RATE OF TRITIUM IN PRIMARY COOLANT*	033201 P 3
#RESPONSE TO QUESTION 9.6 - TRITIUM RELEASE		RATE*	038486 P 4
#RESPONSE TO QUESTION 11.4 - TRITIUM - PRODUCTION		RATE*	060133 P 15
#QUESTION 17 - RADIATION MONITOR		RD4-3 IN LIQUID WASTE SYSTEM.*	016514 P 1
#TECH-SPEC CHANGE 9 GRANTED FOR MIT RESEARCH		REACTOR*	065892 P 15
CHANGES TO TECH SPECS FOR NATIONAL BUREAU OF STANDARDS		REACTOR* #THREE	069713 P 17
#RESPONSE TO QUESTION 11.1C - TRITIUM -		RECYCLING EFFECTS*	042252 P 7
#RESPONSE TO QUESTION 12.10 - EXPOSURE DURING		REFUELING*	090775 P 20
#RESPONSE TO QUESTION 9.2 - TRITIUM-		RELEASE LIMITS*	041759 P 6
11.1 - ESTIMATE (ISOTOPIC BASIS) OF DAILY AND ANNUAL		RELEASE OF RADIOACTIVE MATERIAL* #RESPONSE TO AEC QUESTION	049311 P 10
#RESPONSE TO QUESTION 9.6 - TRITIUM		RELEASE RATE*	038486 P 4
#RESPONSE TO QUESTION 9.6 - TRITIUM		RELEASE*	070788 P 17
#RESPONSE TO QUESTION 9.4 - TRITIUM PRODUCTION AND		RELEASE*	071896 P 17
#RESPONSE TO QUESTION 11.4 - TRITIUM - GENERATION,		RELEASE, MONITORING*	057709 P 12
TO QUESTION 11.1 - ESTIMATED AMOUNTS OF RADIONUCLIDES		RELEASED DAILY AND ANNUALLY* #RESPONSE	046027 P 9
#RESPONSE TO QUESTION 9.5.4 - FRACTION OF TRITIUM		RELEASED OF PRIMARY COOLANT*	041123 P 5
#RESPONSE TO QUESTION 10.3 - TRITIUM PRODUCED AND		RELEASED*	057868 P 13
#RESPONSE TO QUESTION 11.2 - ANNUAL		RELEASES OF LIQUID WASTES (ESTIMATED)*	058307 P 13
#RESPONSE TO QUESTION 11.1 - ESTIMATE OF DAILY AND ANNUAL		RELEASES OF RADIOACTIVITY*	045877 P 8
#RESPONSE TO QUESTION 11.21 -		RELEASES OF TRITIUM AND KRYPTON-85*	081431 P 19
#RESONSE TO QUESTION 11.1A - TRITIUM		RELEASES TO CANAL*	042250 P 6
SURVEILLANCE AND INSPECTION, RADIATION OFFICE,	#	REPLY TO QUESTIONS BY SURVEILLANCE BRANCH, DIVISION OF	065354 P 15
#PROBLEMS IN MEETING AEC		REPORTING AND COMPLIANCE REQUIREMENTS*	075623 P 18
#PROBLEMS IN MEETING AEC REPORTING AND COMPLIANCE		REQUIREMENTS*	075623 P 18
#TECH-SPEC CHANGE 9 GRANTED FOR MIT		RESEARCH REACTOR*	065892 P 15
	#	RESONSE TO QUESTION 11.1A - TRITIUM RELEASES TO CANAL*	042250 P 6
OF DAILY AND ANNUAL RELEASE OF RADIOACTIVE MATERIAL*	#	RESPONSE TO AEC QUESTION 11.1 - ESTIMATE (ISOTOPIC BASIS)	049311 P 10
	#	RESPONSE TO COMMENT 2.17--TRITIUM*	031698 P 3
LIQUID EFFLUENTS*	#	RESPONSE TO QUESTION IE - IDENTIFYING RADIOISOTOPES IN	046591 P 9
PROCESSIVE SYSTEM*	#	RESPONSE TO QUESTION J.4 - CAPABILITIES OF THE WASTE	079914 P 19
LAGOONS*	#	RESPONSE TO QUESTION S11.1B - TRITIUM ASSAYS - TREATMENT	042251 P 6
	#	RESPONSE TO QUESTION 1.8-151B - MANAGEMENT OF TRITIUM*	058116 P 13
	#	RESPONSE TO QUESTION 10.3 - TRITIUM PRODUCED AND RELEASED*	057868 P 13
	#	RESPONSE TO QUESTION 10.3 - TRITIUM*	059547 P 15
AND LIQUID*	#	RESPONSE TO QUESTION 11.1 - DISPOSAL OF RADWASTE, GASEOUS	046924 P 10
RELEASES OF RADIOACTIVITY*	#	RESPONSE TO QUESTION 11.1 - ESTIMATE OF DAILY AND ANNUAL	045877 P 8
RADIONUCLIDES RELEASED DAILY AND ANNUALLY*	#	RESPONSE TO QUESTION 11.1 - ESTIMATED AMOUNTS OF	046027 P 9
	#	RESPONSE TO QUESTION 11.1C - TRITIUM - RECYCLING EFFECTS*	042252 P 7
DISCHARGE*	#	RESPONSE TO QUESTION 11.12 - TRITIUM PRODUCTION AND	084179 P 19
	#	RESPONSE TO QUESTION 11.15 - TRITIUM SHIPMENT*	090772 P 20
WASTES (ESTIMATED)*	#	RESPONSE TO QUESTION 11.2 - ANNUAL RELEASES OF LIQUID	058307 P 13
	#	RESPONSE TO QUESTION 11.2 - DISPOSAL OF CERTAIN WASTES*	058951 P 14
	#	RESPONSE TO QUESTION 11.2 - LIQUID WASTES*	045287 P 8
RADIOACTIVITY IN LIQUID WASTE*	#	RESPONSE TO QUESTION 11.2 - TRITIUM AND OTHER	046573 P 9
KRYPTON-85*	#	RESPONSE TO QUESTION 11.21 - RELEASES OF TRITIUM AND	081431 P 19
RIVER - ACCOUNTABILITY*	#	RESPONSE TO QUESTION 11.3 - RADIOACTIVITY DISCHARGED TO	046185 P 9
	#	RESPONSE TO QUESTION 11.3 - TRITIUM ACCUMULATION*	096601 P 21
	#	RESPONSE TO QUESTION 11.3 - TRITIUM SAMPLING*	037151 P 4

CONTAINMENT* # RESPONSE TO QUESTION 11.36 - COOLANT-TRITIUM CONCENTRATION* 069587 P 16
MONITORING* # RESPONSE TO QUESTION 11.37 - TRITIUM DISPOSAL* 069588 P 16
RESPONSE TO QUESTION 11.4 - DETECTING TRITIUM WITHIN 076805 P 18
RESPONSE TO QUESTION 11.4 - TRITIUM - GENERATION, RELEASE, 057709 P 12
RESPONSE TO QUESTION 11.4 - TRITIUM - PRODUCTION RATE* 060133 P 15
RESPONSE TO QUESTION 11.4 - TRITIUM* 059476 P 14
RADWASTE SYSTEM* # RESPONSE TO QUESTION 11.4 - TRITIUM* 046276 P 9
RESPONSE TO QUESTION 11.5 - SAMPLING TRITIUM (LIQUID 041335 P 6
RESPONSE TO QUESTION 11.5 - TRITIUM PRODUCTION* 055927 P 11
RESPONSE TO QUESTION 11.6 - TRITIUM PRODUCTION* 058311 P 13
CONCENTRATIONS PRIOR TO DISCHARGE FROM STATION* # RESPONSE TO QUESTION 11.7.3 - TRITIUM MONITORING* 081014 P 19
RESPONSE TO QUESTION 11D - MONITORING TRITIUM 042253 P 7
RESPONSE TO QUESTION 12.10 - EXPOSURE DURING REFUELING* 090775 P 20
CONTROL* # RESPONSE TO QUESTION 12.2.4 - TRITIUM MONITORING* 091773 P 20
CONTROL* # RESPONSE TO QUESTION 12.6-A - TRITIUM GENERATION AND 033717 P 3
PRIMARY COOLANT* # RESPONSE TO QUESTION 12.6-A - TRITIUM GENERATION AND 037742 P 4
ACTIVITY AND LEAKAGE* # RESPONSE TO QUESTION 14.6--PRODUCTION RATE OF TRITIUM IN 033201 P 3
PROTECTION OF PERSONNEL* # RESPONSE TO QUESTION 2 - SPECIFICATIONS FOR COOLANT 032438 P 3
CONCENTRATIONS FROM DBA* # RESPONSE TO QUESTION 2.11 - TRITIUM GENERATION RATE AND 056228 P 11
CONCENTRATION FOR DBA* # RESPONSE TO QUESTION 2.4B - TRITIUM AND IODINE 034797 P 3
EJECTOR EXHAUST* # RESPONSE TO QUESTION 2.4C - TRITIUM AND IODINE 034798 P 4
POND* # RESPONSE TO QUESTION 2.6.4 - HYDROGEN AND TRITIUM IN AIR 049779 P 10
RESPONSE TO QUESTION 2.7 - SECONDARY COOLANT AND COOLING 045919 P 8
RESPONSE TO QUESTION 2.8 - SAMPLING THE DISCHARGE CANAL* 045127 P 7
POISON BLADE* # RESPONSE TO QUESTION 3.5E - HISTORY OF CONTAINMENT PURGES* 078809 P 19
MICHIGAN* # RESPONSE TO QUESTION 3.9 - DURABILITY OF CONTROL-ROD 045649 P 8
RESPONSE TO QUESTION 5-1 - CURRENT TRITIUM LEVEL IN LAKE 025191 P 2
FEATURES* # RESPONSE TO QUESTION 7 - TRITIUM CONTROLS* 030617 P 2
HELIUM* # RESPONSE TO QUESTION 8.5 - EMERGENCY POWER TO SAFETY 043647 P 7
WATER* # RESPONSE TO QUESTION 9.10 - FAILURE OF SYSTEM TO PURIFY 058943 P 14
LIQUID RADWASTE* # RESPONSE TO QUESTION 9.12 - EFFECTS OF LIOH ON COOLING 058945 P 14
RESPONSE TO QUESTION 9.2 - ADEQUACY OF SYSTEM FOR TREATING 058655 P 13
RESPONSE TO QUESTION 9.2 - TRITIUM* 059661 P 15
* # RESPONSE TO QUESTION 9.2 - TRITIUM-RELEASE LIMITS* 041759 P 6
PRODUCTION* # RESPONSE TO QUESTION 9.3 - CONTROL OF TRITIUM CONTAMINATION 069648 P 16
RESPONSE TO QUESTION 9.3 - TRITIUM - ESTIMATED RATE OF 057139 P 12
COOLING SYSTEM* # RESPONSE TO QUESTION 9.3 - TRITIUM* 055709 P 11
HAZARD TO WORKERS* # RESPONSE TO QUESTION 9.4 - CONCENTRATION OF TRITIUM IN 042236 P 6
RESPONSE TO QUESTION 9.4 - TRITIUM IN MAIN COOLING SYSTEM - 047723 P 10
PRODUCTION* # RESPONSE TO QUESTION 9.4 - TRITIUM PRODUCTION AND RELEASE* 071896 P 17
OF PRIMARY COOLANT* # RESPONSE TO QUESTION 9.5.2-1 - SOURCES OF TRITIUM 041121 P 5
CHAIN* # RESPONSE TO QUESTION 9.5.4 - FRACTION OF TRITIUM RELEASED 041123 P 5
CONCENTRATIONS IN DISCHARGE CANAL* # RESPONSE TO QUESTION 9.5.5 - TRITIUM/COOLANT/LIQUID-WASTE 041124 P 5
DISCHARGE CANAL VS SOURCE OF WATER* # RESPONSE TO QUESTION 9.5.6 - EVALUATION OF TRITIUM 041125 P 5
RESPONSE TO QUESTION 9.5.7 - TRITIUM CONCENTRATIONS - 041126 P 5
RESPONSE TO QUESTION 9.6 - TRITIUM RELEASE RATE* 038486 P 4
RESPONSE TO QUESTION 9.6 - TRITIUM RELEASE* 070788 P 17
RESPONSE TO QUESTION 9.7 - TRITIUM PRODUCTION* 070528 P 17
RESPONSE TO QUESTION 9.7 - TRITIUM* 055883 P 11
HANDLING, VESSEL INTERNALS, AND TABULATION OF LOCATION OF RESPONSES TO AEC QUESTIONS* #WASTE 030494 P 2
STATEMENT - RIO BLANCO GAS STIMULATION PROJECT, RIO BLANCO COUNTY COLORADO* #ENVIRONMENTAL 074864 P 18
#PROJECT RIO BLANCO ENVIRONMENTAL IMPACT EVALUATION* 045390 P 8
COLORADO* #ENVIRONMENTAL STATEMENT - RIO BLANCO GAS STIMULATION PROJECT, RIO BLANCO COUNTY 074864 P 18
#RESPONSE TO QUESTION 11.3 - RADIOACTIVITY DISCHARGED TO RIVER - ACCOUNTABILITY* 046185 P 9
#RESPONSE TO QUESTION 3.9 - DURABILITY OF CONTROL- ROD POISON BLADE* 045649 P 8
SERVICES* #WEEKLY ROUNDUP OF AEC LICENSING MATERIAL - ALLIED-GULF NUCLEAR 056460 P 12
#QUESTION 4.2--PRODUCTION RATE OF TRITIUM FROM ROUTINE OPERATION* 021603 P 1
#FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (HPIS/251)* 077011 P 18
#FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (HPIS/251)* 088495 P 20
#SPEECH BY T. C. RUNION, PRES., NUCLEAR FUEL SERVICES* 056406 P 11

#RESPONSE TO QUESTION 8.5 - EMERGENCY POWER TO SAFETY FEATURES* 043647 P 7
#RESPONSE TO QUESTION 2.8 - SAMPLING THE DISCHARGE CANAL* 045127 P 7
#RESPONSE TO QUESTION 11.5 - SAMPLING TRITIUM (LIQUID RADWASTE SYSTEM* 041335 P 6
#RESPONSE TO QUESTION 11.3 - TRITIUM SAMPLING* 037151 P 4
#RESPONSE TO QUESTION 2.7 - SECONDARY COOLANT AND COOLING POND* 045919 P 8
#SPEECH BY T. C. RUNION, PRES., NUCLEAR FUEL SERVICES* 056406 P 11
ROUNDUP OF AEC LICENSING MATERIAL - ALLIED-GULF NUCLEAR SERVICES* #WEEKLY 056460 P 12
#RESPONSE TO QUESTION 11.15 - TRITIUM SHIPMENT* 090772 P 20
9.5.7 - TRITIUM CONCENTRATIONS - DISCHARGE CANAL VS SOURCE OF WATER* #RESPONSE TO QUESTION 041126 P 5
#RESPONSE TO QUESTION 9.5.2-1 - SOURCES OF TRITIUM PRODUCTION* 041121 P 5
#TECH- SPEC CHANGE 9 GRANTED FOR MIT RESEARCH REACTOR* 065892 P 15
#RESPONSE TO QUESTION 2 - SPECIFICATIONS FOR COOLANT ACTIVITY AND LEAKAGE* 032438 P 3
#THREE CHANGES TO TECH SPECS FOR NATIONAL BUREAU OF STANDARDS REACTOR* 069713 P 17
SPEECH BY J. W. LANDIS, GULF GENERAL ATOMIC* 056477 P 12
SPEECH BY T. C. RUNION, PRES., NUCLEAR FUEL SERVICES* 056406 P 11
#THREE CHANGES TO TECH SPECS FOR NATIONAL BUREAU OF STANDARDS REACTOR* 069713 P 17
COUNTY COLORADO* #ENVIRONMENTAL STATEMENT - RIO BLANCO GAS STIMULATION PROJECT, RIO BLANCO 074864 P 18
* #FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (HPIS/251) 077011 P 18
* #FINAL ENVIRONMENTAL STATEMENT CONCERNING PROPOSED RULE MAKING ACTION (HPIS/251) 088495 P 20
#ENVIRONMENTAL STATEMENT, UNDERGROUND NUCLEAR TEST PROGRAMS* 068802 P 16
- MONITORING TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM STATION* #RESPONSE TO QUESTION 11D 042253 P 7
#ENVIRONMENTAL STATEMENT - RIO BLANCO GAS STIMULATION PROJECT, RIO BLANCO COUNTY COLORADO* 074864 P 18
3 TO PSAR - ADDITIONAL INFORMATION TC AEC QUESTIONS IN SUPPLEMENT 1* #SUPPLEMENT 030610 P 2
QUESTIONS IN SUPPLEMENT 1* # SUPPLEMENT 3 TO PSAR - ADDITIONAL INFORMATION TO AEC 030610 P 2

#REPLY TO QUESTIONS BY SURVEILLANCE BRANCH, DIVISION OF	SURVEILLANCE AND INSPECTION, RADIATION OFFICE,	065354 P 15
INSPECTION, RADIATION OFFICE, #REPLY TO QUESTIONS BY	SURVEILLANCE BRANCH, DIVISION OF SURVEILLANCE AND	065354 P 15
#RESPONSE TO QUESTION 9.4 - TRITIUM IN MAIN COOLING	SYSTEM - HAZARD TO WORKERS*	047723 P 10
#RESPONSE TO QUESTION 9.2 - ADEQUACY OF	SYSTEM FOR TREATING LIQUID RADWASTE*	058655 P 13
#RESPONSE TO QUESTION 9.10 - FAILURE OF	SYSTEM TO PURIFY HELIUM*	058943 P 14
TO QUESTION 9.4 - CONCENTRATION OF TRITIUM IN COOLING	SYSTEM* #RESPONSE	042236 P 6
TO QUESTION 11.5 - SAMPLING TRITIUM (LIQUID RADWASTE	SYSTEM* #RESPONSE	041335 P 6
TO QUESTION J.4 - CAPABILITIES OF THE WASTE PROCESSIVE	SYSTEM* #RESPONSE	079914 P 19
#QUESTION 17.- RADIATION MONITOR RD4-3 IN LIQUID WASTE	SYSTEM.*	016514 P 1
#RESPONSE TO QUESTION	S11.1B - TRITIUM ASSAYS - TREATMENT LAGOONS*	042251 P 6
#SPEECH BY	T. C. RUNION, PRES., NUCLEAR FUEL SERVICES*	056406 P 11
#WASTE HANDLING, VESSEL INTERNALS, AND	TABULATION OF LOCATION OF RESPONSES TO AEC QUESTIONS*	030494 P 2
#THREE CHANGES TO	TECH SPECS FOR NATIONAL BUREAU OF STANDARDS REACTOR*	069713 P 17
#	TECH-SPEC CHANGE 9 GRANTED FOR MIT RESEARCH REACTOR*	065892 P 15
#ENVIRONMENTAL STATEMENT. UNDERGROUND NUCLEAR	TEST PROGRAMS*	068802 P 16
STANDARDS REACTOR* #	THREE CHANGES TO TECH SPECS FOR NATIONAL BUREAU OF	069713 P 17
#RESPONSE TO QUFSTION 9.2 - ADEQUACY OF SYSTEM FOR	TREATING LIQUID RADWASTE*	058655 P 13
#RESPONSE TO QUESTION S11.1B - TRITIUM ASSAYS -	TREATMENT LAGOONS*	042251 P 6
#RESPONSE TO QUESTION 11.5 - SAMPLING	TRITIUM (LIQUID RADWASTE SYSTEM*	041335 P 6
#RESPONSE TO QUESTION 9.3 -	TRITIUM - ESTIMATED RATE OF PRODUCTION*	057139 P 12
#RESPONSE TO QUESTION 11.4 -	TRITIUM - GENERATION, RELEASE, MONITORING*	057709 P 12
#RESPONSE TO QUESTION 11.4 -	TRITIUM - PRODUCTION RATE*	060133 P 15
#RESPONSE TO QUESTION 11.1C -	TRITIUM - RECYCLING EFFECTS*	042252 P 7
#RESPONSE TO QUESTION 11.3 -	TRITIUM ACCUMULATION*	096601 P 21
#RESPONSE TO QUESTION 2.4C -	TRITIUM AND IODINE CONCENTRATION FOR DBA*	034798 P 4
#RESPONSE TO QUESTION 2.4B -	TRITIUM AND IODINE CONCENTRATIONS FROM DBA*	034797 P 3
#RESPONSE TO QUESTION 11.21 - RELEASES OF	TRITIUM AND KRYPTON-85*	081631 P 19
#RESPONSE TO QUESTION 11.2 -	TRITIUM AND OTHER RADIOACTIVITY IN LIQUID WASTE*	046573 P 9
#RESPONSE TO QUESTION S11.1B -	TRITIUM ASSAYS - TREATMENT LAGOONS*	042251 P 6
#QUESTION 4.7 -	TRITIUM BUILDUP AND HAZARD*	022680 P 1
#RESPONSE TO QUESTION 11.36 - COOLANT-	TRITIUM CONCENTRATION*	069587 P 16
* #RESPONSE TO QUESTION 9.5.7 -	TRITIUM CONCENTRATIONS - DISCHARGE CANAL VS SOURCE OF WATER	041126 P 5
#RESPONSE TO QUESTION 9.5.6 - EVALUATION OF	TRITIUM CONCENTRATIONS IN DISCHARGE CANAL*	041125 P 5
#RESPONSE TO QUESTION 11D - MONITORING	TRITIUM CONCENTRATIONS PRIOR TO DISCHARGE FROM STATION*	042253 P 7
#RESPONSE TO QUESTION 9.3 - CONTROL OF	TRITIUM CONTAMINATION*	069648 P 16
#RESPONSE TO QUESTION 7 -	TRITIUM CONTROLS*	030617 P 2
#QUESTION F.3 - ESTIMATE AND JUSTIFY	TRITIUM DISCHARGE IN LIQUID*	014585 P 1
#RESPONSE TO QUESTION 11.37 -	TRITIUM DISPOSAL*	069588 P 16
#QUESTION 10 - ANALYSIS OF	TRITIUM DOSES FROM HEAT EXCHANGER FAILURE*	017924 P 1
#QUESTION 4.2--PRODUCTION RATE OF	TRITIUM FROM ROUTINE OPERATION*	021603 P 1
#RESPONSE TO QUESTION 12.6-A -	TRITIUM GENERATION AND CONTROL*	033717 P 3
#RESPONSE TO QUESTION 12.6-A -	TRITIUM GENERATION AND CONTROL*	037742 P 4
#RESPONSE TO QUESTION 2.11 -	TRITIUM GENERATION RATE AND PROTECTION OF PERSONNEL*	056228 P 11
#RESPONSE TO QUESTION 2.6.4 - HYDROGEN AND	TRITIUM IN AIR EJECTOR EXHAUST*	049779 P 10
#RESPONSE TO QUESTION 9.4 - CONCENTRATION OF	TRITIUM IN COOLING SYSTEM*	042236 P 6
#RESPONSE TO QUESTION 9.4 -	TRITIUM IN MAIN COOLING SYSTEM - HAZARD TO WORKERS*	047723 P 10
#RESPONSE TO QUESTION 14.6--PRODUCTION RATE OF	TRITIUM IN PRIMARY COOLANT*	033201 P 3
#RESPONSE TO QUESTION 5-1 - CURRENT	TRITIUM LEVEL IN LAKE MICHIGAN*	025191 P 2
#RESPONSE TO QUESTION 12.2.4 -	TRITIUM MONITORING*	091773 P 20
#RESPONSE TO QUESTION 11.7.3 -	TRITIUM MONITORING*	081014 P 19
#RESPONSE TO QUESTION 10.3 -	TRITIUM PRODUCED AND RELEASED*	057868 P 13
#RESPONSE TO QUESTION 11.12 -	TRITIUM PRODUCTION AND DISCHARGE*	084179 P 19
#RESPONSE TO QUESTION 9.4 -	TRITIUM PRODUCTION AND RELEASE*	071896 P 17
#RESPONSE TO QUESTION 9.7 -	TRITIUM PRODUCTION*	070528 P 17
#RESPONSE TO QUESTION 9.5.2-1 - SOURCES OF	TRITIUM PRODUCTION*	041121 P 5
#RESPONSE TO QUESTION 11.6 -	TRITIUM PRODUCTION*	058311 P 13
#RESPONSE TO QUESTION 11.5 -	TRITIUM PRODUCTION*	055527 P 11
#RESPONSE TO QUESTION 9.6 -	TRITIUM RELEASE RATE*	038486 P 4
#RESPONSE TO QUESTION 9.6 -	TRITIUM RELEASE*	070788 P 17
#RESPONSE TO QUESTION 9.5.4 - FRACTION OF	TRITIUM RELEASED OF PRIMARY COOLANT*	041123 P 5
#RESONSE TO QUESTION 11.1A -	TRITIUM RELEASES TO CANAL*	042250 P 6
#RESPONSE TO QUESTION 11.3 -	TRITIUM SAMPLING*	037151 P 4
#RESPONSE TO QUESTION 11.15 -	TRITIUM SHIPMENT*	090772 P 20
#RESPONSE TO QUESTION 11.4 - DETECTING	TRITIUM WITHIN CONTAINMENT*	076805 P 18
#RESPONSE TO QUESTION 9.2 -	TRITIUM*	059661 P 15
#RESPONSE TO QUESTION 11.4 -	TRITIUM*	059476 P 14
#RESPONSE TO QUESTION 9.3 -	TRITIUM*	055709 P 11
#RESPONSE TO COMMENT 2.17--	TRITIUM*	031698 P 3
#RESPONSE TO QUESTION 1.8-151B - MANAGEMENT OF	TRITIUM*	058116 P 13
#RESPONSE TO QUESTION 9.7 -	TRITIUM*	055883 P 11
#RESPONSE TO QUESTION 11.4 -	TRITIUM*	046276 P 9
#RESPONSE TO QUESTION 10.3 -	TRITIUM*	059547 P 15
#RESPONSE TO QUESTION 9.2 -	TRITIUM-RELEASE LIMITS*	041759 P 6
#RESPONSE TO QUESTION 9.5.5 -	TRITIUM/COOLANT/LIQUID-WASTE CHAIN*	041124 P 5
#ENVIRONMENTAL STATEMENT.	UNDERGROUND NUCLEAR TEST PROGRAMS*	068802 P 16
#ENVIRONMENTAL IMPACT OF PLANT OPERATION	UP TO JULY 1, 1972*	072847 P 17

TO AEC QUESTIONS* #WASTE HANDLING, VESSEL INTERNALS, AND TABULATION OF LOCATION OF RESPONSES 030494 P 2
QUESTION 9.5.7 - TRITIUM CONCENTRATIONS - DISCHARGE CANAL VS SOURCE OF WATER* #RESPONSE TO 041126 P 5

#SPEECH BY J. W. LANDIS, GULF GENERAL ATOMIC* 056477 P 12
#RESPONSE TO QUESTION 9.5.5 - TRITIUM/COOLANT/LIQUID- WASTE CHAIN* 041124 P 5
LOCATION OF RESPONSES TO AEC QUESTIONS* # WASTE HANDLING, VESSEL INTERNALS, AND TABULATION OF 030494 P 2
#RESPONSE TO QUESTION J.4 - CAPABILITIES OF THE WASTE PROCESSIVE SYSTEM* 079914 P 19
#QUESTION 17 - RADIATION MONITOR RD4-3 IN LIQUID WASTE SYSTEM.* 016514 P 1
QUESTION 11.2 - TRITIUM AND OTHER RADIOACTIVITY IN LIQUID WASTE* #RESPONSE TO 046573 P 9
#RESPONSE TO QUESTION 11.2 - ANNUAL RELEASES OF LIQUID WASTES (ESTIMATED)* 058307 P 13
#RESPONSE TO QUESTION 11.2 - DISPOSAL OF CERTAIN WASTES* 058951 P 14
#RESPONSE TO QUESTION 11.2 - LIQUID WASTES* 045287 P 8
#RESPONSE TO QUESTION 9.12 - EFFECTS OF LIOH ON COOLING WATER* 058945 P 14
- TRITIUM CONCENTRATIONS - DISCHARGE CANAL VS SOURCE OF WATER* #RESPONSE TO QUESTION 9.5.7 041126 P 5
NUCLEAR SERVICES* # WEEKLY ROUNDUP OF AEC LICENSING MATERIAL - ALLIED-GULF 056460 P 12
#RESPONSE TO QUESTION 11.4 - DETECTING TRITIUM WITHIN CONTAINMENT* 076805 P 18
QUESTION 9.4 - TRITIUM IN MAIN COOLING SYSTEM - HAZARD TO WORKERS* #RESPONSE TO 047723 P 10

ORNL-5057
UC-41 — Health and Safety

INTERNAL DISTRIBUTION

1-2. Central Research Library
3. Document Reference Section
4-23. Laboratory Records
24. Laboratory Records, ORNL, R.C.
25. ORNL Patent Office
26. J. A. Auxier
27. S. R. Bernard
28. R. E. Blanco
29. J. R. Buchanan
30. J. F. Clarke
31. E. L. Compere
32. F. L. Culler
33-57. M. N. Dixon
58. C. E. Easterly
59. R. F. Hibbs
60. G. D. Kerr
61. Herman Postma
62. J. W. Poston
63. J. D. Redman
64. R. L. Scott
65. John Storer
66. H. E. Walburg
67-119. Assessment and Technology File

EXTERNAL DISTRIBUTION

120. Research and Technical Support Division, ORO
121. Martin Biles, USERDA, Germantown, Maryland
122. R. L. Butenhoff, USERDA, Germantown, Maryland
123. George Cowper, Atomic Energy of Canada, LTD, Chalk River Nuclear Labs, Chalk River, Ontario K0J 1J0, CANADA
124. L. J. Deal, USERDA, Germantown, Maryland
125. C. W. Edington, USERDA, Germantown, Maryland
126. Merle Eisenbud, New York University Medical Center, 550 1st Avenue, New York, NY 10016
127. E. D. Goldberg, Scripps Inst. of Oceanography, LaJolla, Calif. 92037
128. J. H. Harley, BNL
129. R. L. Hirsch, USERDA, Germantown, Maryland
130. John Korando, Lawrence Livermore Labs
131. J. L. Liverman, USERDA, Germantown, Maryland
132. Sidney Marks, USERDA, Germantown, Maryland
133. A. A. Moghissi, Ga. Inst. of Tech, Atlanta, Ga.
134. F. K. Pittman, USERDA, Germantown, Maryland.
135. John Rust, Univ. of Chicago, 950 E. 59th St., Chicago, Ill. 60637
136. J. K. Soldat, Pacific N.W. Labs, Richland, Wash. 99352
137. L. V. Spencer, National Bureau of Standards
138. R. C. Thompson, BNWL
139. J. N. Teem, USERDA, Germantown, Maryland
140. R. W. Wood, USERDA, Germantown, Maryland
141-385. Given distribution as shown in TID-4500 under category Health and Safety (25 copies — NTIS)

☆U. S. GOVERNMENT PRINTING OFFICE: 1975-748-189/17