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INTER-COMPANY CORRESPONDENCE

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS COMPANY LOCATION Post Office Box P OAK RIDGE, TENN.

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TO Mr. J. A. Marshall

LOCATION K-303-7

DATE July 20, 1954

ANSWERING LETTER DATE

ATTENTION

COPY TO

Mr. J. W. Arendt	Mr. R. G. Jordan
Mr. R. M. Batch	Mr. D. M. Lang
Mr. E. C. Bollinger	Dr. R. L. Macklin
Dr. A. D. Callihan	Mr. J. A. Parsons
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SUBJECT K-1410 Decontamination and Recovery Facility

KS-438

M-40395

RECEIVED JUL 22 1954

KS 438 9 A

This document has been approved for release to the public by: [signature] 4/19/96 Date

Technical Information Officer Oak Ridge K-25 Site

The attached tabular summary and equipment location diagram outline our understanding of the provisions of the criticality approval letters which have been issued for the K-1410 uranium decontamination and recovery facility, and thus indicate the current status of the operation and equipment controls for nuclear safety in this area. This summary will be issued annually and will include new installations, equipment revisions, operational changes, and specified controls for the prevention of a criticality reaction as indicated in the respective approval letters issued during the year.

Primary equipment has been designed within the K-25 concepts of "safe" geometry for product assay uranium,[1] and all items of equipment, including units moving along predetermined paths, are spaced to meet the interaction solid angle limitation of 1.0 steradian.

Please advise if equipment locations or other information given herein are in agreement with existing operations.

HFH:AJM:mh

APPROVAL COMMITTEE ON RADIATION HAZARDS

[signature] A. D. Callihan

[signature] H. F. Henry

[signature] R. L. Macklin

Carbide and Carbon Chemicals Corporation, Operating Contractor for the U.S. Atomic Energy Commission.

K25RC NOT TO BE LOANED FROM PLANT RECORDS K-1034

1 Henry, H. F., Mallett, A. J., Newlon, C. E., and Rohr, R. C., Basic Critical Mass Information and its Application to K-25 Design and Operation, First Revision, 6-8-53, (K-1019)

Classification changed to: UNCLASSIFIED (Name and category)

[signature] 16 AUG 95 ADC or ADD signature (first reviewer) Date

[signature] 8/29/95 Date

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WCX 163 (3-5)

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K-1410 DECONTAMINATION & RECOVERY FACILITY

Component	Function	Equipment Design	Control Method Summary: Design: Cyl.	Design: Slab	Design: Vol.	Operation Limits: Mass	Operation Limits: Assay	Operation Limits: Conc.	Operational Controls
I. DECONTAMINATION AREA									**I. DECONTAMINATION**
A. K-1131 Soak Tank KS-328	Decontamination of contaminated equipment from K-1131.	12' x 4' x 4'8" tank divided into 3 sections containing Na_2CO_3 solution, HNO_3 solution, and rinse water, respectively.					x		A. Only equipment positively identified as coming from K-1131 and containing normal assay uranium is cleaned in tanks.
B. Degreaser Unit KS-328 KS-105	Cleaning of contaminated equipment "gunked" with oils or grease by a trichloroethylene spray.	6' x 4' x 7-1/2' tank with slab depth controlled at 1.5" by overflows. 4" I.D. x 5' storage reservoir. 4" I.D. x 20" overflow bucket. Recirculating centrifugal pump.	x x	x	x				B. 1. Overflow drains are maintained open. 2. Drainage openings maintained in insulation jacket of the tank. 3. Overflow bucket removal at west end of pit only.
C. Spray Tank KS-327 KS-37	Spray decontamination of miscellaneous equipment.	12' x 6' x 5' tank with sloping base to a central 12' long x 1-1/2" wide x 4' high vertical slab reservoir. Recirculating centrifugal pump. 5" I.D. x 3' overflow bucket.	x	x	x				C. 1. Overflow drain maintained open. 2. Solution transfer to containers other than the "always-safe" storage columns is made to appropriate vessels on a batch basis according to uranium analysis results.
D. Rinse Tank KS-63 KS-37	Water rinse of equipment previously decontaminated in spray tank.	6' x 6' x 4' high tank with safe slab depth controlled at 1.5" by overflows. 5" I.D. x 3' overflow bucket. Recirculating centrifugal pump.	x	x	x				D. 1. Overflow drain maintained open. 2. Note C-2 above.

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Component	Function	Equipment Design	Control Method Summary: Design			Control Method Summary: Operation Limits			Operational Controls
			Cyl.	Slab	Vol.	Mass	Assay	Conc.	
E. Wash Table KS-296 KS-108	Hand decontamination of small equipment.	4' x 3-1/2' sink with a 10' long drain board - slab depth controlled at 1.5" by overflows. 4" I.D. "U" shaped storage loop. Diaphragm recirculating pump. 5" I.D. x 1' overflow bucket.	 x x	x 	 x 				E. 1. Overflow drains maintained open. 2. Overflow solution is returned to table only when it is empty. 3. Uranium containers other than overflow buckets are maintained 3' away from table. 4. Overflow buckets are moved through the oxide production area only when reactors are in fixed position and no other uranium containers are in transit.
F. Vapor Blast Unit KS-296	Blast cleaning of the equipment previously scrubbed in wash table.	4' x 6' blast cabinet with a 22" x 32" x 2" vertical slab reservoir. 20" x 20" x 3" vent exhaust filter. 8" O.D. x 2" centrifugal pump. (3) 5" I.D. x 2' overflow containers.	 x	x 	 x 	 x 			F. 1. Overflow drains are maintained open. 2. No uranium-bearing containers within 3' of system. 3. Exhaust filter spray cleaned with fresh water at regular intervals to prevent abrasive and uranium pickup. 4. Contaminated abrasive removed from reservoir in a pan of safe slab depth and stored in "always-safe" containers.
G. Rinse Table KS-296 KS-108	Water rinse of equipment items previously cleaned in the wash table and/or the vapor blast unit.	Equipment identical to that of wash table. Note Part E.	x	x	x				G. 1. Same as that specified for wash table.

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Component	Function	Equipment Design	Control Method Summary: Design Cyl.	Design Slab	Design Vol.	Operation Limits Mass	Operation Limits Assay	Operation Limits Conc.	Operational Controls
H. Acid Table KS-311	Final removal of surface contamination from equipment precleaned in wash tables and/or vapor blast unit.	Table equipped with a 3' x 3'6" x 9" deep sink and a 3' x 4-1/2' drain board. Slab depth controlled at 1.5" by overflows.		x					H. 1. Overflow drains are maintained open. 2. Uranium bearing containers are maintained at least 6' away from the table.
		Two interconnected 5" I.D. x 3'8" storage reservoirs.	x						
		Safe diaphragm recirculating pump.			x				
		4" I.D. x 18-1/2" overflow bucket.	x						
I. Cylinder Decontamination Unit. KS-328, KS-296 KS-139, KS-86	Decontamination of cylinders containing uranium heels.	Two 5" I.D. x 6' storage towers.	x						I. 1. Storage of cylinders to comply with spacing requirements as specified for other systems in K-1410.
		Centrifugal pump.			x				
		4" I.D. x 5' overflow tower.	x						
II. RECOVERY AREA									II. RECOVERY AREA
A. NH_3 Digester System (2 similar units) KS-253, KS-167 KS-162, KS-149 KS-142, KS-139	Removal of uranium from solutions by ammonia precipitation process to produce ammonium diuranate which is filtered from solutions.	6" x 6" filter press.			x				A. 1. Uranium-bearing containers within solution storage and recovery area prohibited. 2. Number of frames for filter press limited to seven 1" or fourteen 1/2" frames. 3. Filtrate collector for filter press not to exceed size of 1/2 liter bottles. 4. Reactors removed singly on dolly along approved routes. 5. Movement of containers through south door prohibited.
		(4) 5" I.D. x 30' storage towers.	x						
		4" I.D. x 5' glass section above a 5" I.D. x 16' stainless steel section.	x						
		4" I.D. x 5' glass overflow collector (common to both systems)	x						
		Diaphragm pump.			x				
		5" I.D. x 33" cylindrical filters.	x						
		4" I.D. x 30" reactors.	x						

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Component	Function	Equipment Design	Control Method Summary: Design			Control Method Summary: Operation Limits			Operational Controls
			Cyl.	Slab	Vol.	Mass	Assay	Conc.	
B. Oxide Furnaces, Cooling and Storage Area. KS-87, KS-81	Ammonium diuranate in 4" I.D. x 30" reactors is converted by heat to uranium oxide with the vent gases being bubbled through a 5" I.D. bubbler column for recovery. Reactors are stored in approved storage area after cooling in a vent exhaust system.	4" I.D. x 30" reactors.	x						B. 1. Reactors moved only on reactor dollies. 2. One container in motion at a time. 3. Reactors stored in approved storage facilities.
C. Rod Mill and Oxide Transfer Unit KS-87	Uranium oxide in the 4" I.D. reactor cylinders is ground in a rod mill and transferred in shipping containers.	4" I.D. x 30" reactors.	x						C. 1. Reactors temporarily stored in specified storage racks. 2. Not more than 4 uranium containers in rod mill and transfer cubicle in following specified positions. a. Rod mill (2 reactors) b. Transfer unit (1 cylinder) c. Weighing table (1 cylinder)

III. SPECIAL OPERATIONS

Nonroutine operations involving the decontamination of unsafe equipment items containing unknown quantities of enriched uranium material will receive special consideration.

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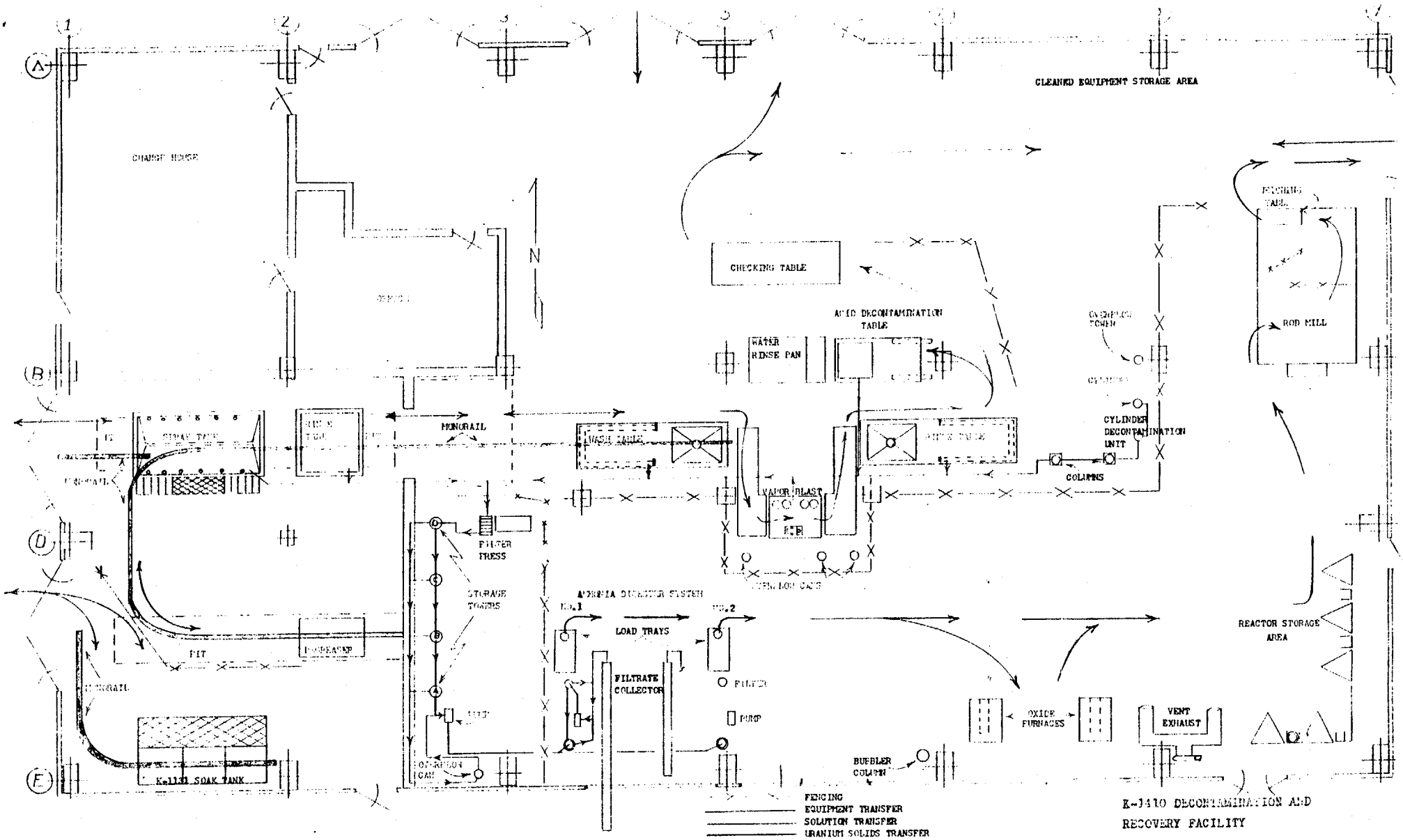
CLEANED EQUIPMENT STORAGE AREA
CHANGE HOUSE
CHECKING TABLE
ACID DECONTAMINATION TABLE
WATER RINSE PAN
ROD MILL
MONORAIL
CYLINDER DECONTAMINATION UNIT
COLUMNS
VAPOR BLAST
FILTER PRESS
STORAGE TOWERS
LOAD TRAYS
FILTRATE COLLECTOR
FILTER
PUMP
PIT
K-1131 SOAK TANK
OXIDE FURNACES
VENT EXHAUST
BUBBLER COLUMN
REACTOR STORAGE AREA
FENCING
EQUIPMENT TRANSFER
SOLUTION TRANSFER
URANIUM SOLIDS TRANSFER
K-1410 DECONTAMINATION AND RECOVERY FACILITY