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Bulletin GM-PRO-2

U. S. ATOMIC ENERGY COMMISSION

Serial No. 95

SF Accountability

TRANSMITTAL NOTICE

July 7, 1952

1. The attached general revision of Bulletin GM-PRO-2 authorizes the issuance of a manual to cover detailed procedures for "Accounting for Source and Fissionable Materials." The "SF Accountability Manual" will be distributed to appropriate personnel by the Division of Production. This Bulletin and the Manual which it sets forth shall govern SF accountability procedures.
2. Please remove Bulletin GM-PRO-2 (Serial No. 95) dated August 15, 1951, from your manual and replace it with the attached revision.

This document is UNCLASSIFIED
 Date MAY 01 1997
 by R. Theisen, EAS

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OUTLINE

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ACCOUNTING FOR SOURCE & FISSIONABLE MATERIALS

FOR: Managers of Operations

REF: Section 5, Atomic Energy Act of 1946. Supersedes Bulletin GM-PRO-2 dated August 15, 1951.

*1. Scope.

- a. The provisions of this Bulletin shall apply to all source and fissionable materials (hereinafter referred to as SF materials), and to such other materials as may from time to time be directed by the General Manager, which are owned by, in the possession of, or in use by the Atomic Energy Commission, its contractors, or other Government agencies, except:
 - (1) Source material not owned by the Atomic Energy Commission.
 - (2) Source material prior to removal from its place of deposit in nature.
- b. The provisions of this Bulletin do not apply to the records and reports which show the dollar value of SF materials produced, transferred or on inventory.

*2. Purpose.

- a. The purpose of this Bulletin is to establish:
 - (1) A measurement and record system for transfers and inventories which will promptly provide current and accurate information as to the disposition and availability of SF materials and, in addition, will be capable of disclosing any loss or misappropriation with an accuracy and promptness appropriate for the dollar cost and strategic importance of the material. Unless otherwise determined by Managers of Operations, it shall be assumed that effort appropriate for the dollar cost will also be appropriate for the strategic importance.
 - (2) A system of surveys to provide management with information as to the adequacy of SF material accounting control procedures in effect.

*3. Program Development and Administration.

a. Division of Production.

- (1) The Source and Fissionable Materials Accountability Branch of the Washington Division of Production shall coordinate and give staff supervision to the development and administration of accounting procedures for quantitative control of SF materials of the Atomic

Energy Commission. To determine the adequacy of the national system of SF material accounting and to provide the Atomic Energy Commission with information as to the effectiveness and reliability of this control, the Branch shall also survey SF Accountability Stations handling or having custody of SF materials. Specifically the SF Materials Accountability Branch shall:

- (a) Establish, within the policies prescribed by the General Manager, SF material accounting and reporting procedures necessary to provide overall quantitative control for SF materials under the jurisdiction of the Atomic Energy Commission.
- (b) Develop SF material survey guides for use in surveys by Operations Offices.
- (c) Develop and recommend to the Director of Production improved SF material accounting control methods.
- (d) Prepare consolidated reports of inventories, transfers and losses of SF materials.
- (e) Survey Accountability Stations as directed by the Director of Production.
- (f) Participate in surveys made by Operations Offices as directed by the Director of Production.
- (g) Review and evaluate the adequacy of consolidated monthly SF reports and survey reports prepared by the Operations Offices.
- (h) Consult with and advise the Operations Offices regarding SF material accounting control problems.

b. Managers of Operations.

(1) Responsibility for instituting and maintaining appropriate accounting control over the Commission's SF materials rests upon each Manager of Operations. He shall:

(a) Determine that all contractor and AEC organizations under his jurisdiction which handle or have custody of SF materials are acquainted with the material accounting objectives and requirements of the Atomic Energy Commission as outlined in this Bulletin and SF Accountability Manual.

(b) Ensure that these organizations will inventory, report and transfer SF materials in accordance with the provisions of this Bulletin, and the SF Accountability Manual.

(c) Arrange for the establishment of SF Accountability Stations, with designated SF Accountability Representatives, prior to

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transfer of any SF material to AEC or contractor organizations, except as provided in Paragraphs 10 c (1) and 12 of this Bulletin.

- (d) Maintain appropriate records of SF materials, including inventories, receipts, shipments, production and losses at Accountability Stations under his jurisdiction, and submit monthly consolidated inventory and material balance reports covering SF materials at these Accountability Stations.
- (e) Maintain a continuing study of quantities of SF material lost or unaccounted for at Accountability Stations under his jurisdiction.
- (f) Work with the Division of Production staff in the development of national programs, standards, and procedures based upon operating needs.
- (g) Make surveys of each Accountability Station under his jurisdiction as frequently as conditions demand, but at intervals not greater than six months for each major Station and not greater than twelve months for each other Station handling important quantities of SF materials.
- (h) Arrange assistance and participation in surveys of Accountability Stations under his jurisdiction when made by the SF Materials Accountability Branch, Washington Division of Production.
- (i) Ensure that appropriate action is taken to correct each significant inadequacy in SF material accounting disclosed by Operations Office or Division of Production surveys at Stations under his jurisdiction.

(2) For purposes of this Bulletin, the Division of Raw Materials, the Colorado Raw Materials Office, and the San Francisco Area Office shall also be considered Operations Offices, and provisions concerning Managers of Operations shall apply equally to the Director of Raw Materials, the Manager of Colorado Raw Materials Office, and the Manager of San Francisco Area Office.

c. SF Accountability Stations.

(1) SF Accountability Stations shall be established by each Manager of Operations to facilitate accounting for SF materials. For this purpose the term "SF Accountability Station" shall mean one organization at one location having custody of and responsibility for SF materials independently of other organizations at the same or other locations. (An SF Accountability Station will usually be further subdivided into internal material balance areas for such purposes as process control, needs of the Production Cost Accounting system, etc.). The Atomic Energy Commission and its several contractors

are separate organizations and shall constitute separate Accountability Stations.

(2) Acceptance of SF materials by an Accountability Station entails the responsibility to properly account for the materials received, together with the responsibility for preventing misappropriation and for minimizing avoidable losses. Therefore each receiver shall independently measure SF materials received to determine the magnitude of the responsibility incurred, and each shipper shall measure SF materials shipped to determine the extent to which responsibility is relieved. (Measurement methods, exceptions, and practicability shall be governed by Paragraph 7 of this Bulletin.)

(3) Physical inventories shall be taken to verify the quantities of SF materials. Material balance reports shall be submitted as soon as possible after the end of each month. (Inventory methods, exceptions and practicability shall be governed by Paragraph 7 of this Bulletin.)

(4) It shall be the responsibility of each Accountability Station to use appropriate inventory and material balance procedures. This responsibility includes use of adequate weighing, sampling, analytical and recording methods, and the determination of the accuracy and precision of the measurements. In addition each Accountability Station shall maintain a procedure manual which describes its SF material accounting procedures. (Information required in Station SF Material Accounting Procedure Manuals was specified in memoranda from the General Manager to the Managers of Operations, dated June 23, 1949, and November 29, 1949.)

(5) It is recommended that each installation devise a single system of inventory and material balance reports and double entry records which will provide information required for both accounting control and operating supervision rather than to employ two parallel systems.

*4. Surveys.

a. Definition. For purposes of this Bulletin, a survey is a comprehensive examination, analysis and evaluation of all phases of SF material accounting control, including material records, inventory procedures, measurement and statistical methods in use by the installations, and an independent test of the inventory.

b. Objectives. Surveys shall be made to determine and record the effectiveness of SF material accounting control procedures in use, to provide management with information as to the appropriateness of these procedures, and to formulate and report an independent opinion upon the fairness of the quantities reflected in the material balance reports of the Station.

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c. Standards. All SF material accounting surveys shall be made and reported in accordance with the provisions of the January 18, 1950, Manual of Procedure Standards for SF Material Accounting Surveys, as revised.

d. Report Distribution. The distribution of survey reports shall include one copy for: the organization surveyed; the Manager of Operations having jurisdiction; the Director of Production; the appropriate Washington Division Director; and the SF Materials Accountability Branch of the Washington Division of Production.

e. Performance of Surveys.

(1) Each Operations Office shall make surveys of Accountability Stations under its jurisdiction as scheduled by the Manager of Operations.

(2) The SF Materials Accountability Branch, Washington Division of Production, shall make surveys as required by the Director of Production. Each Operations Office shall participate and assist in surveys of Accountability Stations under its jurisdiction when made by the Washington Division of Production.

f. Scope and Frequency.

(1) Surveys of Accountability Stations under its jurisdiction shall be made by each Operations Office as prescribed by the Manager of Operations, but at intervals not greater than six months for each major Station and not greater than twelve months for each other Station handling important quantities of SF material.

(2) If an SF Accountability Station is surveyed by an Operations Office in conjunction with the SF Materials Accountability Branch, Washington Division of Production, no separate survey by the Operations Office within the specified interval is required.

g. Recommendations.

(1) When a survey by an Operations Office or the Division of Production discloses an inadequacy in SF material accounting control of such a nature that a formal recommendation is made, the Operations Office shall thereafter issue a quarterly report summarizing progress on each unaccomplished recommendation, and shall issue a final report summarizing results when the recommendation is accomplished. These reports shall include a copy for the Source and Fissionable Materials Accountability Branch, Division of Production.

(2) When the quarterly report on recommendations coincides with a survey report, the summary of progress will be treated in the survey report and no separate report need be issued.

*5. SF Accountability Stations.

a. The SF Materials Accountability Branch, Washington Division of Production, shall assign a three-letter symbol to each SF Accounta-

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bility Station (AEC office or contractor's organization) which handles SF materials.

b. It shall be the responsibility of Managers of Operations to notify the SF Materials Accountability Branch, Washington Division of Production, of any additional Accountability Stations necessitated by operations or research activities, so that appropriate code symbols can be assigned and revised Accountability Station symbol sheets can be issued to keep the list current.

c. Establishment of an Accountability Station does not imply authorization to ship SF materials from or to that Station. Shipments from and receipts by Accountability Stations must first be authorized by the AEC offices having jurisdiction over those Stations.

*6. Accountability Representatives.

a. Centralizing the responsibility of accounting for receipts, shipments and inventories of SF materials in a particular plant, laboratory or AEC office is the most practicable method of preventing omissions, duplications, and confusion in accountability records.

b. Each SF Accountability Station shall therefore designate an Accountability Representative, who shall account for all SF materials located in that Accountability Station and who shall also be responsible for maintaining adequate double-entry accounting records of receipts, shipments, inventories, production and losses of SF materials.

c. SF material receiving and shipping documents (Form AEC-101) shall, in all instances, immediately go to the Accountability Representative and become part of his records. SF materials shall be received, shipped, and handled in a manner consistent with accepted internal control procedures, which generally would preclude the Accountability Representative from handling material.

*7. Measurement Methods.

a. Using the most reliable practicable methods the shipper and the receiver shall independently determine the quantities transferred.

b. Quantities of SF material on hand shall be physically inventoried monthly. Inventory procedures shall provide routine control and periodic SF verification appropriate for the cost of the material. In general, at a station having an inventory of SF material worth \$5,000,000, or processing \$1,000,000 worth of SF material per month, the SF content of all material on hand shall be ascertained with maximum practicable accuracy at intervals not greater than six months. Greater or less frequency of inventory involving maximum practicable accuracy shall be prescribed by the Manager of Operations on the basis of the individual circumstances, but in no case at intervals greater than twelve months for any station.

c. In general, the measurement method will consist of weighing, sampling and analyzing each unit, batch or container of material and,

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where appropriate, determining the isotopic composition. If sampling is impracticable, such as for finished metal pieces, other methods (e.g., alpha counting, neutron multiplication, etc.) may be useful for determining SF content.

d. Uranium which has undergone no processing altering the natural U-235 content shall be deemed to be 0.7115 weight percent U-235 and no isotopic determination is required.

e. Appropriateness and Practicability. The appropriateness and practicability of accurate measurement is affected by such diverse factors as type of material, its quantity, its value, the difficulties of measurement, the cost of measurement, the extent of analytical data on like material, the availability of personnel and facilities, the contribution of the measurement inaccuracy to the uncertainty of the overall plant or laboratory material balance, etc. Such factors may render impracticable all or part of the sampling, weighing and analytical routines outlined above as general measurement methods. Statistical analysis of these routines will aid correct judgment as to practicability, and will help in finding practicable improvements to routine measurement procedures.

*8. Statistics. Reliability of determination of the SF content of material is influenced by adequacy of sampling procedures and by accuracy and precision of weighings and of chemical and physical analyses that together comprise the determination. Modern statistical methods should be used in evaluating sampling plans, determining accuracy and precision, and recognizing possible improvements in sampling and measurement schemes. Statistical analysis of the overall material balance will indicate the relative importance of the several sources of unreliability, enabling efficient allocation of effort to improve reliability.

*9. Material Balance Reports.

a. Each SF Accountability Station and each Operations Office having Accountability Stations under its jurisdiction, which have SF materials on hand or which receive or ship SF materials, shall prepare material balance reports in accordance with this Bulletin and the SF Accountability Manual issued by the Director of Production.

b. Material balance reports shall contain one section showing a material balance for the current month and one section showing a material balance for the fiscal year-to-date.

*10. Records.

a. Each SF Accountability Station and each Operations Office shall maintain permanent double-entry accounting records reflecting the SF material receipts, shipments, inventories, and losses for each SF material handled.

b. The quantities shown on the material balance reports shall agree with the quantities reflected on the SF material accounting records.

c. All SF material transfers between stations shall be recorded on the SF Shipping Form, Form AEC-101. The use of any other forms for such transfers is prohibited.

(1) Transfer of accountability for SF material between stations shall not be effective without physical transfer of the material. Likewise, physical transfer of SF materials shall result in transfer of accountability to the receiving SF Accountability Station, except as authorized by the Director of Production.

(2) SF Shipping Forms shall be classified in accordance with existing security regulations.

(3) The content, copy distribution and transmittal of SF Shipping Forms shall conform to provisions of the SF Accountability Manual issued by the Director of Production.

d. The shipper and receiver should maintain their respective SF material accounting records on the basis of their own measurements.

*11. SF Materials Removed From the Commission Inventory.

a. Unrecoverable Materials.

(1) Purpose. To clear inventory records of SF material which is impracticable to recover or restore to usable form, because recovery operations would be too costly.

(2) Procedure. Materials from which the SF content cannot feasibly be recovered may be removed from current SF material accounting records. Such write-offs shall be authorized by the Manager of Operations having jurisdiction and shown in the "Material Removed" section of the monthly material balance reports. If the SF content has been measured, the item shall be entitled "Unrecoverable Material - Measured." If the SF content has not been measured, the item shall be entitled "Unrecoverable Material - Estimated," and the basis of the estimate shall be explained by footnote.

(3) Conditions. Before materials for which recovery of the SF content is considered impracticable are removed from the SF material accounting records, the contractor having custody of the material shall submit to the appropriate Manager of Operations an application describing the material, specifying its SF content, and explaining why recovery is not considered feasible. (For a continuing operation which produces an unrecoverable waste, it is contemplated that write-off specifications and limits will be established and authorized on a continuing basis, rather than making a separate application and approval for each lot or batch of the waste material.) Each Operations Office shall retain file copies of such applications and of the related approvals.

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(4) Location Record. A record shall be maintained by the SF Accountability Station showing the location of unrecoverable materials which have been removed from its SF material accounting records.

b. Research Issuances.

(1) Purpose. To establish personal responsibility for small quantities of SF material allotted to research work, and to eliminate monthly inventory reports for such allotments.

(2) Fissionable Material.

(a) Managers of Operations are authorized to approve the issuance of fissionable material to individuals within an SF Accountability Station having a Basic or a Special Quota approved under the provisions of Bulletin GM-RES-1.

(b) Issuances of fissionable material to individuals, or contractors not having an approved Basic or Special Quota, shall be authorized by the Director of Research, in accordance with the provisions of Bulletin GM-RES-1.

(c) The inventory of materials held by an individual under the provisions of this Section shall not exceed the following quantities:

1 gram plutonium
1 gram U-235
100 milligrams U-233

(3) Source Materials.

(a) Managers of Operations are authorized to approve the issuance of source materials to individuals at an SF Accountability Station and to individuals and contractors other than SF Accountability Stations.

(b) The inventory of any one source material held by any individual under the provisions of this Paragraph shall not exceed fifty kilograms.

(4) Conditions.

(a) Each Research Issuance shall be supported by an application signed by the individual to whom the material is to be charged. The application shall describe the material desired, specify the SF content, briefly explain the proposed material use, and agree to: conduct the research in accordance with AEC health, safety, security and other applicable requirements; make no transfer of any portion of the material to another individual or to any Station without the consent of the

issuing Accountability Station; conserve the material and return any remaining portion thereof at the conclusion of the research to the issuing Accountability Station; and submit a material balance report at the end of each fiscal year and at the conclusion of the research.

(b) A Manager of Operations may delegate authority to approve applications for Research Issuances. The Operations Office shall maintain a file of copies of the applications and related approvals.

c. Exceptions. SF materials removed from AEC inventory records for any reason other than those specified in this Section shall be approved in writing by the appropriate Washington Division Director.

*12. SF Accountability Manual. The Director of Production is authorized and directed to issue an SF Accountability Manual covering interpretations and detailed instructions for implementation of this Bulletin.

M. M. Boyer
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