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C.E. Smith	1		

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October 4, 1974

U. S. Atomic Energy Commission
Materials and Plant Protection Branch
Directorate of Licensing
Washington, D. C. 20545

Attn: Mr. C. N. Smith

Dear Sir:

Enclosed please find a redraft of the "Fundamental Material Controls and Nuclear Material Safeguards Procedures".

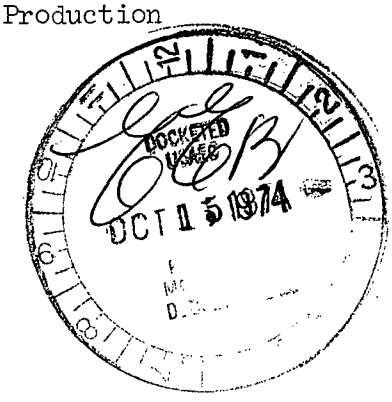
As mentioned in my letter of 10/3/74, Section C "Measurements and Statistical Controls" and Section F "Inventory" will be submitted as soon as we have them completed, but no later than 10/31/74.

Thank you for your consideration and guidance.

Very truly yours,

James J. McGovern
Manager
Radiochemical Production

JJMcG:js
Enclosure



2062

UNION CARBIDE CORPORATION
STERLING FOREST LABORATORY

Fundamental Material Controls And Nuclear Material Safeguards Procedures

A.1 Facility Organization

Responsibility for the control and accountability of SNM is vested in an organizational segment that is separate and distinct from the production segment using the SNM. The site SNM Accountability Officer is the Health Physics Supervisor. He is responsible also for developing and conducting physical inventories, and for receipt and shipment of SNM. He has direct access to the Manager, Nucleonics. The using segment, the Radiochemical Production department, has responsibility for keeping day-to-day records of SNM transfer in various stages of the process stream; and reports to Manager, Nucleonics through the Manager, Radiochemical Production. The Quality Assurance group performs assays on incoming material, and material in process at inventory time.

The organization chart (Appendix A) shows the relationship between the above segments.

A.2 The Manager of Radiochemical Operations, Manager of Health Physics, and the Manager of Quality Assurance are responsible for the development of accountability procedures for SNM. Approval of these procedures will be the responsibility of the Nuclear Safeguards Committee.

Implementation of the accountability program will be carried out as follows:

(a) Receiving and shipping will be carried out by authorized persons in the Radiochemical Production and Reactor Operations groups under the supervision of the Health Physics Manager (SNM Accountability Officer) or his designee.

(b) Inventory will be the responsibility of the SNM Accountability Officer.

(c) Storage and internal transfers are to be carried out by authorized individuals under the direction of the SNM Accountability Officer.

(d) Measurements in process are to be carried out by authorized individuals in the Radiochemical Production group. Measurements for inventory are to be carried out by authorized individuals in the Quality Assurance group.

A.2 (e) The maintenance of records and filing of reports will be the responsibility of the SNM Accountability Officer.

A custodian will be assigned for each material balance area (MBA) who will be cognizant of the safeguards procedures required in the area. This custodian will also be accountable for SNM assigned his area. In addition to custodians, certain authorized individuals will be designated to work with SNM in material balance areas who are familiar with safety and safeguards procedures.

A list of the current SNM custodians and authorized persons is included as Appendix "B".

In addition to the above individuals involved in the development and implementation of this program, members of the Nuclear Safeguards Committee will be consulted to approve changes and perform periodic audits.

B. Facility Operation

Highly-enriched uranium oxide (UO_2), received from a SNM supplier, is dissolved to form a solution. The uranium is then plated out of solution in a layer on the inside of steel tubes. The amount of SNM plated in each tube is determined by weighing. The tubes are welded closed. After quality-control measurements, the sealed tubes are irradiated in a nuclear reactor. Irradiated tubes are transferred to shielded hot cells where they are opened, the uranium is dissolved, and the desired products are chemically separated. After some months decay the uranium solution, still highly radioactive, is packaged for shipment to a licensed burial ground.

The flow diagram (Appendix C) shows the sequence of operations, the waste streams, and the locations in the process where SNM logs are maintained (Material Balance Areas (MBA). The basis for these MBA's are as follows:

(a) UO_2 Feed area is separated by location and administration. Access to this area is controlled by the Health Physics department (SNM Accountability Officer).

(b) The Plating Encapsulation and Quality Control MBA is separated by process requirements. The process being the fabrication of finished irradiation targets.

(c) The Reactor Irradiation MBA is separated by process (or function) location and administration.

(d) The Radiochemical Operations MBA is also separated by process location and administration.

D. Shipping and Receiving

Each batch of UO_2 received is measured for verification of the supplier's analysis of U element and U-235 isotope. If significant differences between shipper's and receiver's analyses are evident, and cannot be resolved, only that quantity which is actually measured to have been received will be recorded and reported.

All orders for SNM will be endorsed by the SNM Accountability Officer. Receipt of shipments will be made under the supervision of the SNM Accountability Officer or his designee.

Measurements of outgoing shipments of uranium will be made where feasible. All outgoing shipments will be supervised by the SNM Accountability Officer or his designee.

E. Storage and Internal Transfers

Special Nuclear Material used in this facility is predominately received in the form of UO_2 powder and is highly enriched, ($\geq 93\%$). Individual batches which are received retain their identity in storage in the UO_2 Feed MBA.

When material is received on site the quantity is logged into the SNM Master Log and the appropriate MBA Log. The Master Log is maintained by the SNM Accountability Officer, and the MBA Log is maintained by the cognizant SNM custodian for that area. Whenever material is moved from one MBA to another, the transfer is noted on the Master Log and the appropriate MBA Logs. All transfers are acknowledged by custodian signature receipt in the appropriate MBA Logs.

Material transferred from the UO_2 Feed MBA to the Plating and Quality Control MBA is measured by weighing.

Material transferred from the Plating and Quality Control MBA to the Reactor Irradiation MBA is measured by weighing and radiometric assay. This material is encapsulated in sealed irradiation targets which contain serial numbers in numerical sequence.

Material transferred from the Reactor Irradiation MBA to the Radiochemical Processing MBA is not measured because of high levels of radiation from the targets (several thousand R/hr). Targets are identified by serial number.

Material in the Radiochemical Process MBA retains its identity by target serial number, it is processed and stored inside hot cells. The radiation levels inside these hot cells is several thousand R/hr. Any material transferred from this MBA is solidified in concrete inside of a specification 2R container; it is further encased in an outer container which is sealed by concrete. Transfer is made inside a shielded shipping cask to a licensed land burial site. The typical radiation reading from the unshielded material in a typical shipment is several hundred R/hr.

G. Records and Reports

The quantities of SNM added to and removed from the process are recorded in a master log under the jurisdiction of the Accountability Officer.

Transfers of SNM at various stages of the process are recorded in intermediate logs under the jurisdiction of the production or operating segments.

All log entries are signed by the custodian responsible for each log.

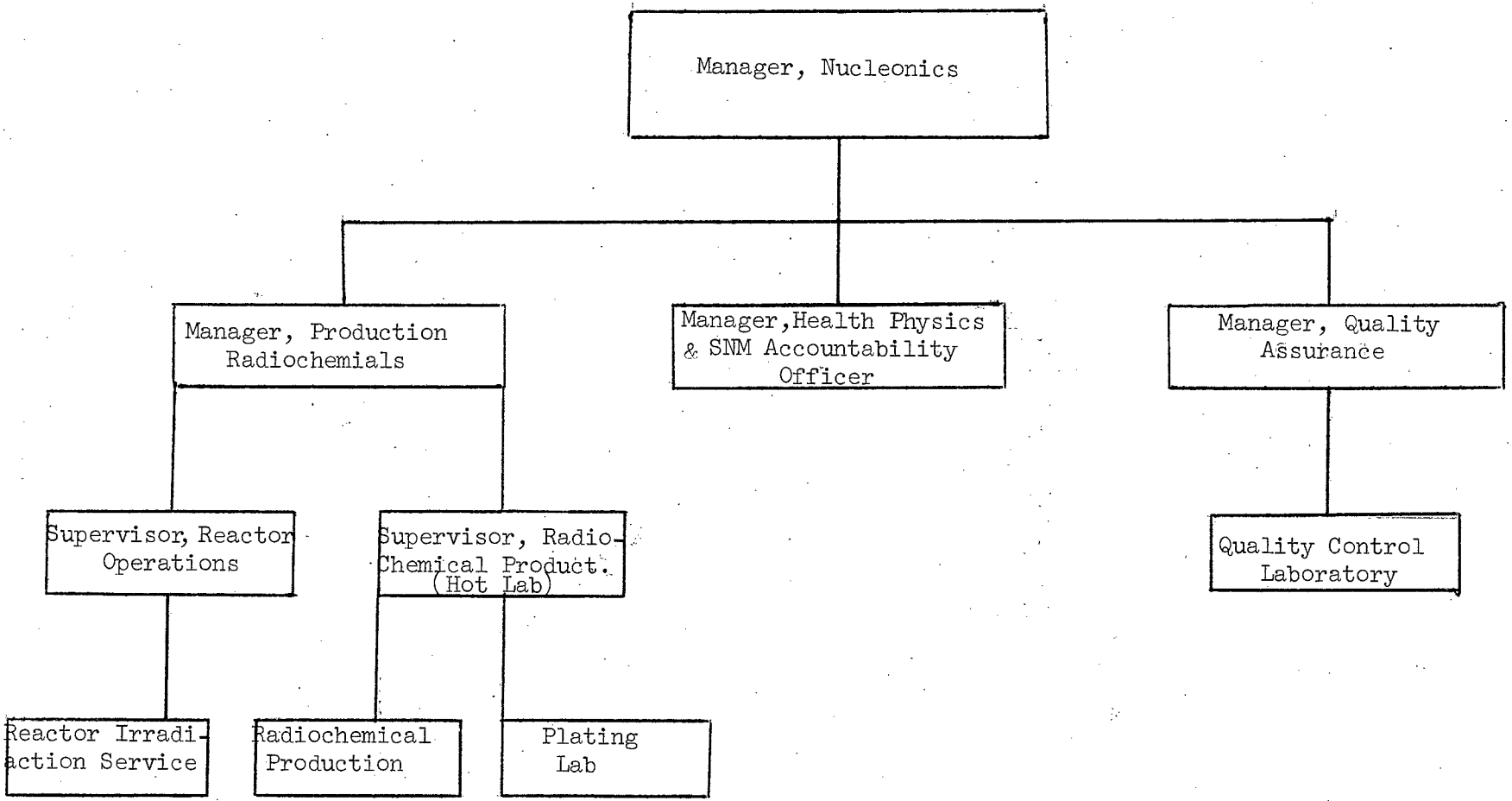
The master log forms part of the permanent (5 year or more retention) records of the plant and is filed in the Health Physic department. Access to the file is controlled by the Accountability Officer. Records and reports of inventory will be made in accordance with procedures outlined in Section F.

A copy of the Master Log and MBA Log are shown in Appendix "D".

H. Management of Material Controls System

An audit of the SNM controls and accountability system will be made annually by a representative of the Nuclear Safeguards Committee. These audits will, in addition to montoring for adherence to license requirements, review LEMUF's, recorded MUF's for relevance and credibility.

Significant diversions of MUF's as recorded in inventory recorded, from those specified as allowable under Section C of this FMC procedure will be reported to the Nuclear Safeguards Committee for review. If warranted the Committee will direct that corrective action be taken by the responsible operating manager.


Manager, Nucleonics
Manager, Production Radiochemials
Manager, Health Physics & SNM Accountability Officer
Manager, Quality Assurance
Supervisor, Reactor Operations
Supervisor, Radio-Chemical Product. (Hot Lab)
Quality Control Laboratory
Reactor Irradi-action Service
Radiochemical Production
Plating Lab

APPENDIX "A"

CUSTODIANS AND AUTHORIZED INDIVIDUALS

C. J. Konnerth, Site Accountability Officer (SAO)

J. J. McGovern, ALTERNATE SAO

J. L. Ditton, Custodian (Material in storage)

J. P. Dise, Custodian (Material in Plating Process)

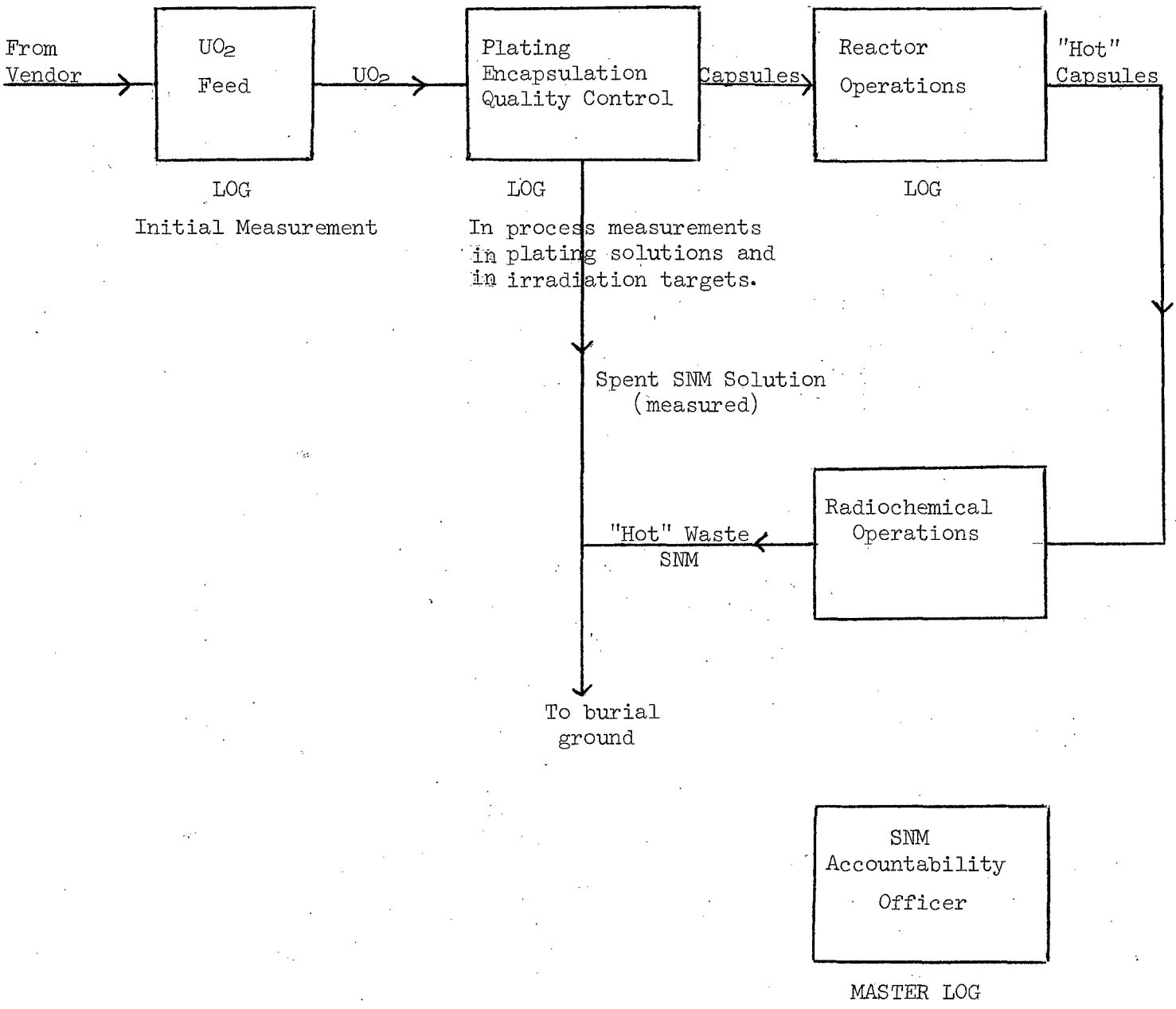
W. Fecych (Reactor Operations Supervisor)

D. D. Grogan, Custodian (Material in Hot Cell storage)

H. C. Hart (Asst. Supervisor Reactor Operations)

A. B. Innis, Custodian (Material in Reactor Irradiation)

R. D. Hansen, Custodian (Material in Quality Control)



PLANT PROCESS FLOW DIAGRAM

(Each block in flow chart represents a material balance area.)