

U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS

REGION V

IE
R# Inspection Report No. 70-25/76-03 (IE-V-112)

RIS: LAL & ZAZ

Licensee: Atomics International
Rockwell International
8900 DeSoto Avenue

Docket No. 70-25

License No.(s) SNM-21

Canoga Park, California 91304

Priority 1

Facility: _____

Category 1

Location: Canoga Park and Santa Susana, Calif.

Type of Facility: Fuel Fabrication and R&D

Type of Inspection: Material Control and Accounting
Routine, Announced

Dates of Inspection: March 1-5, 1976

Dates of Previous Inspection: October 20-24, 1975

Principal Inspector: *Y. Kobori* 3/26/76
Y. Kobori, Auditor (Date)

Accompanying Inspectors: *G. Hamada* 3/26/76
G. H. Hamada, Chemist/Statistician (Date)

Majzlo for 4/1/76
(Date)

Other Accompanying Personnel: None

Reviewed by: *Majzlo* 76 78 4/1/76
V. N. Rizzolo, Chief, Safeguards Branch (Date)
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APPROVAL OF IEV

B. SCOPE OF INSPECTION

The scope of the inspection was limited to the following procedures as defined in the Inspection and Enforcement Manual.

<u>Procedure No.</u>	<u>Subject</u>
85206B	Measurement and Statistical Controls
85210B	Storage and Internal Control
85212B	Physical Inventory
85214B	MUF and Associated LE

C. SUMMARY OF FINDINGS

1. Enforcement Actions

Violations

None.

Infractions

None.

Deficiencies

- a. Contrary to 10 CFR 70.51(e)(4)(i) and (ii), AI did not within 30 calendar days of its November 3, 1975 physical inventory (1) reconcile and adjust the book record of quantity of element and fissile isotope to the results of the physical inventory; and (2) calculate, for the material balance interval terminated by that inventory, the material unaccounted for (MUF) and its associated limit of error for each element and fissile isotope for uranium contained in material in process.
(See Details, Paragraph H.3.a.(1))
- b. Contrary to 10 CFR 70.51(f)(4)(v), the written inventory instructions for the March 1, 1976 physical inventory did not identify the means by which material or inventory will be listed to assure that each item is inventoried and that there is no duplication.
(See Details, Paragraph H.3.a.(2))

D. LICENSEE ACTION ON PREVIOUSLY IDENTIFIED ENFORCEMENT ITEMS

The current inspection did not include a records or reports audit; therefore, followup on previously identified enforcement items relating to Procedure No. 85216B was rescheduled to the next inspection.

E. UNUSUAL OCCURRENCES

None.

F. OTHER SIGNIFICANT FINDINGS

Current Findings

1. During this inspection, which included observation of AI's bimonthly physical inventory, certain significant practices and procedures in the ATR area were noted. In the ATR powder room (MBA 12), large quantities of ATR powder, sometimes in excess of 90 Kgs, containing high enriched uranium, were stored on the floor without benefit of tamper safing devices. The acceptability of this storage arrangement will not be addressed here since a Headquarters (NMSS) review team a few days earlier had also noted this situation and discussed it with AI management. The fact that the powder containers were not secured with a tamper safing device, however, meant that verification of the SNM content of these containers was needed. This was done by taking a grab sample from each container for destructive analysis and reweighing a group of randomly selected containers not only as a means of confirming their previous weights but also to check for possible weight change due to moisture pickup. Using the tare weights previously established for the containers, the previous weights on the powder were reproduced to within 1.5 gms from a total weight of approximately 9 Kgs. Tamper safing seals were applied to the containers after sampling.

 2. It was also observed that pieces of cut-up ATR plates wrapped in polyethylene bags were stored in the ATR vault. No unique markings or serial numbers were used to characterize the cut-up pieces. It therefore appeared that some means of verifying the SNM content of this material was needed. The licensee was agreeable to destructively analyzing samples from all of the pieces but since the uranium-aluminum alloy cannot be physically separated from the aluminum frame (or casing) after the rolling operation, analysis on a sample basis will be biased. Such being
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the case, the licensee elected to perform the confirmatory measurement on these pieces by arranging them approximately into their original shape (plate) and performing a gamma assay with their plate overcheck system.

Status of Previously Reported Unresolved Items

None.

G. MANAGEMENT INTERVIEW

The results of the inspection were discussed with Dr. W. Meyers, Director, Fuel Programs; Dr. M. E. Remley, Manager, Health, Safety and Radiation Services; and Mr. V. J. Schaubert, Manager, Nuclear Materials Management. The items of noncompliance were identified for the licensee and acknowledged by the licensee.

With respect to the noncompliance item regarding delinquent reconciliation of book to physical inventory (November 3, 1975), AI believes this recurring problem has been largely solved through the acquisition and installation of the necessary equipment for performing head-end treatment of difficult-to-sample sidestream materials which was the primary cause of the delay. Past scheduling conflicts between Production staff and Nuclear Materials Management staff regarding priorities were also stated to have been resolved.

H. REPORT DETAILS

1. Persons Contacted

M. E. Remley, Manager, Health, Safety and Radiation Services
V. J. Schaubert, Manager, Nuclear Materials Management
D. C. Allen, Nuclear Materials Management Representative
E. Walsh, Methods Analyst, Nuclear Materials Management
J. Kim, Statistician, Nuclear Materials Management
S. Wode, Management Systems Specialist
D. Espinoza, Custodian Vault
D. Benaga, Custodian ATR Vault
D. Hicks, System Analyst
C. Mason, Special Clerk
S. Elmstedt, MGA-12 Custodian
M. Klenck, Chemist
J. Wallace, Health and Safety Technician
W. Delozier, Senior Mechanic
E. Peters, Manufacturing Planner
R. Clerk, Chemist
C. Gunzelman, Nuclear Material Analyst

2. Storage and Internal Controls

The inspection was conducted in accordance with Procedure 85210B to verify that a system of storage and internal controls was established by the licensee to provide for current knowledge of the quantity, identity and location of all SNM within his facility. There were no items of noncompliance as a result of this review.

The inspection determined that:

- a. Processing material balance areas (MBA) are maintaining current knowledge of all SNM within MBA's by a combination of MBA records, files of internal transfer forms, production forms, and inventory item cards.
 - b. Perpetual inventory records are being maintained by the NMM office for the primary vault storage MBA, the ATR vault item control area (ICA) and waste storage MBA. These records are reconciled with physical inventory listings on a bimonthly basis.
 - c. Other MBA's such as the analytical, QA, metallurgical, and the hot laboratories maintain current knowledge of all SNM in their areas by means other than perpetual inventory records.
 - d. Adequate controls are maintained over the distribution and use of internal transfer documents.
 - e. Movement of SNM between MBA's or ICA's are documented. It was observed that ingots, unclad fuel pins, pin casting heels and shards, dross, sidestream glass and crucibles, etc., are transferred at calculated U and U-235 values based on original charge or melt data from processing areas to the vault MBA. Adjustments of inventory items to analytical values are often at an MBA location, such as the vault, removed from the point of origination. Frequently, inventory items will have been moved on to the next process step to the assembly MBA before the analytical results are available. MUF, therefore, can be generated in such places as the vault or assembly MBA's. The licensee's material control and accounting plan submitted to NRC for approval under Part 70.51(g) provided for such usage of calculated values.
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AI is currently in the process of developing software programming to provide computer generated adjusting documentation for differences between calculated and analytical/isotopic data. It is intended that such documentation will result in returning the MUF to the proper point of origination so as to permit a meaningful material balance around each MBA.

A random sampling of internal transfer vouchers included tracing of calculated U and U-235 factors to original production charge or melt sheets. Analytical or isotopic data were traced to a summary compilation by the AI statistician. These tests were satisfactory.

- f. Internal transfer vouchers are signed by duly delegated individuals.
- g. The licensee's procedure manual does not include a current procedure for "Internal Transfers." While most other procedures were rewritten and implemented August 15, 1975, AI utilizes a procedure for internal transfers dated November 1970. Updating and reissue of this procedure was encouraged.
- h. The procedure manual does not now include a procedure covering the records control and retention program required under Part 70.51(e)(4). While the subject is basically covered in AI's material control and accounting plan, AI was encouraged to prepare this internal procedure.

3. Physical Inventory

The inspection was conducted in accordance with Procedure 85212B to evaluate the licensee's program of accounting for SNM and its conduct of physical inventories to assure that the licensee's program is capable of detecting losses or diversions of SNM.

- a. Two items of noncompliance were isolated as follows:
 - (1) 10 CFR 70.51(e)(4)(i) and (ii) requires that a licensee (1) calculate for the material balance interval the MUF and its associated limit of error for each element and fissile isotope for uranium contained in material in process; and (2) reconcile and adjust the

book record of its SNM inventory to the results of the physical inventory within 30 days of the start of each physical inventory.

The review disclosed that for the November 3, 1975 physical inventory, final adjustments to the results of the physical inventory were not recorded in the licensee's ledgers until December 12, 1975, a period in excess of 30 days. This delay was attributed to late analytical results on gross and sidestream glass and crucible samples from the EBR-II program and recycle powder samples from the ATR program. Sampling had been delayed due to conflict between Production and NMM priorities in the use of available equipment and manpower. The licensee has indicated that this difficulty has been resolved such that similar delays should not recur.

The delay in closing the books of records resulted not only in late MUF determinations but also late limits of error determinations.

- (2) 10 CFR 70.51(f)(4) requires that physical inventories be conducted according to written inventory instructions for each specific inventory which shall include among other instructions the specification that it identify the means by which material or inventory will be listed to assure that each item is inventoried and that there is no duplication. The written inventory instructions for March 1, 1976 did not address itself to that subject and may have contributed to momentary confusion observed in an inventory team in the vault MBA with respect to the placement of inventory tags.

b. The inspection further determined that:

- (1) The licensee has conducted physical inventories at required frequencies.
- (2) Except as noted above, the book inventory has been reconciled with and adjusted to the results of each specific physical inventory within 30 days of the start of the physical inventory.
- (3) All inventory items were being listed sequentially in each MBA during the observation of the inspectors. Inventory items not tamper safed were so identified on the inventory list by specific location and ear-marked for remeasurement.

- (4) Tamperproofing seals are available only to delegated individuals and seal application and destruct records are being maintained. In the ATR powder MBA, inventory sampling of a number of untamper-proofed containers of already production-sampled U-Alx powder was required. A seal control officer had not yet been designated or delegated for this area.

4. Measurements and Statistical Controls

The inspection was conducted in accordance with Procedure 85206B to ascertain if the licensee has established, maintained, and is following his approved measurement control program as submitted to the Commission.

Only a limited review of these categories was performed. The areas covered were found to be in compliance with requirements. For example, in attempting to determine if replicate samples are taken from ATR powder, it was learned that two 100 gm samples and one 5 gm sample are taken from each powder batch. The larger samples are for QC tests and the 5 gm sample presumably for uranium assay. Upon investigation, it was determined that sub-samples from both 100 fractions, as well as the 5 gm sample are submitted to Chemistry, thus giving triplicate analyses per batch.

Observation of XRF analysis of EBR-II material indicated that appropriate procedures and practices are being followed.

5. Material Unaccounted For and Associated Limit of Error

The inspection was conducted in accordance with Procedure 85214B to review and evaluate the licensee's capabilities for determining and calculating the material unaccounted for (MUF) quantities and the associated statistical limits of error (LEMUF) as part of the licensee's material control and accounting procedures.

During the special inspection of February 6, 1976 (IE Inspection Report No. 70-25/76-02 (IE-V-105)), it was indicated that the licensee was continuing in his effort to identify the factors responsible for causing the U-235 MUF to remain greater than the LEMUF specifications but less than 1.5 times the specifications. It was also noted at that time that at least part of the problem appeared to result from a suspected bias in the "heels" data. Heels, more often than not, gave low results when compared to pin analysis data derived from the same heat. There was strong evidence that these discrepancies were due to sampling difficulties. Ingots, like heels, are sampled similarly and are subject to the same problems. Unlike prior periods, the ingot population was large at the close of the current

material balance period and thus required sampling and analysis. Further, unlike prior periods, ingot analyses had essentially been completed even before the completion of the physical inventory for the current period. Preliminary evaluation of ingot data indicated that the results were significantly lower than the nominal values derived from input data. It was estimated that a MUF of approximately 800 gms was in the making just from this source. While this might or might not give any more credence to the argument that the low results are indicative of sampling bias, it did focus attention on the recurring problem of MUF's resulting from ingot and heel analyses. Since the licensee this time had almost another month in which to resolve this problem, he embarked on a program to find a new method of sampling ingots and heels which would lessen or eliminate the "oxidation" problem which was thought to be the cause of the "bias." (See IE Inspection Report No. 70-25/76-02 (IE-V-105) for discussion of the oxidation problem.) After some initial difficulties, the licensee was apparently able to obtain satisfactory samples by sawing off larger pieces as opposed to the drilling method used earlier. Subsequent telephone communication with the licensee revealed that the reanalysis of ingots had been completed and the results of the samples obtained by the new method were in good agreement with the input data and, therefore, the apparent MUF problem had been resolved. The licensee is currently evaluating these as well as prior period data relating to pins, ingots and heels to determine if a relationship between these components can be established which shows a statistically significant bias due to sampling.

It might be pointed out that during the period when the question of "biased" ingot results was still not resolved, melt activities (MBA 2) were essentially shut down. It was only after the second set of ingot analysis data was obtained showing agreement with input values, that Nuclear Materials Management permitted these ingots to be put back into process.