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U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

Region V

Report No. 70-25/81-07 (IE-V-465)

Docket No. 70-25 License No. SNM-21 Safeguards Group I

Licensee: Energy Systems Group, Rockwell International

8900 De Soto Avenue

Canoga Park, California 91304

Facility Name: Energy Systems Group, Atomic International

Inspection at: Headquarters, De Soto Facility

Inspection Conducted: Oct. 19-24, Nov. 2-6 & 16-17 & 30, Dec. 1-4, 1981

Date of Last Material Control and Accounting Inspection Visit: March 16-20, 1981

Type of Inspection: Announced, Material Control and Accounting

Inspectors: B. L. Brock 1/14/82  
B. L. Brock, Chemist Date Signed

A. V. Wieder 1/14/82  
A. V. Wieder, Safeguards Auditor Date Signed

G. B. Nelson 1/14/82  
G. B. Nelson, Chemist Date Signed

Approved by: L. R. Nordenhaug 1/14/82  
L. R. Nordenhaug, Chief, Safeguards Branch Date Signed

Inspection Summary:

Areas Inspected: Routine announced safeguards inspection of facility operations, measurements and statistics, shipper receiver differences, storage and internal controls, physical inventory, inventory verification, ID and LEID, records and reports and management of material control systems. The inspection involved 364 inspector-hours onsite by 7 inspectors.

Results: There was one item of noncompliance within the 9 areas inspected.

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DETAILS

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1. Key Persons Contacted

Energy Systems Group, Rockwell International

- \*R. G. Jones, Vice President and Controller
- \*M. E. Remley, Director, Health, Safety and Radiation Services
- \*V. J. Schaubert, Manager, Nuclear Materials Management
- \*D. C. Allen, Engineer, Nuclear Materials Management
- R. L. Jaseph, Staff Engineer, QA Audits and Controls
- J. A. Birg, Staff Engineer, QA Audits and Controls
- S. Wode, Management Systems Specialist
- J. Kim, Statistician

The inspectors also interviewed other licensee personnel engaged in production, QA measurements, and material control and accounting.

\*Denotes those attending the exit interview.

Specialist, USNRC, Who Assisted in the Inspection

- L. R. Norderhaug, Chief, Safeguards Branch, Reg. V, USNRC
- M. E. Auerbach, Auditor, Headquarters, USNRC
- E. W. Brach, Senior MC&A Specialist, Headquarters, USNRC
- J. E. Kent, Statistician, Headquarters, USNRC

2. Licensee Action on Previous Inspection Findings

There were no outstanding items of noncompliance from prior inspections.

3. Exit Interview

The inspection findings were discussed with the licensee personnel denoted in paragraph 1.

- a. One item of noncompliance was identified. The licensee did not verify the integrity of all tamper-safing seals when he performed the physical inventory of MBA-01, his storage vault, on November 3, 1981.
- b. Fifteen barrels of waste, 55 gallon size, showed sufficient corrosion of the container walls to indicate a loss of container integrity. (This information was given to the health and safety inspectors in Region V as an item to followup). The licensee had, during the inspection, repackaged the contents of 60 barrels of waste on inventory. The barrels identified by the inspectors were not among those repackaged. The licensee indicated he planned to overpack the 15 identified waste drums as well as a few more he had identified as needing attention. A decision of which overpack to use is pending.

- c. The licensee identified a safety problem with an electrical connection to the barrel scanner. It appeared that a scheduled repair was delayed by the licensee's inventory activities.
  - d. A four-liter glass bottle of Acetone stored on the concrete floor of the storage vault was identified as a safety hazard. It was subsequently removed from the vault and stored in a metal cabinet designate as a flammable solvent storage container.
  - e. A sign on the door of the Weighing Room indicated that smoking, eating and drinking were prohibited in that area, yet prohibitions were not adhered to. The licensee stated the sign was no longer required since the room's use had changed and the removal of the sign had been overlooked. The licensee subsequently removed the sign.
  - f. It was suggested by an inspector that the use of a Continuous Air Monitor (CAM) in the room where samples are drilled or cut from uranium metal would be advantageous. Technicians could be warned by a CAM of higher than acceptable levels of airborne radioactive particles during sampling operations. The licensee now uses a drill press to drill a sample from uranium metal pieces, and believes this operation does not warrant a CAM. In the past, a cutting wheel was used to obtain small samples from the uranium metal pieces. The matter will be reviewed by licensee's safety management.
  - g. The door of a closet containing electrical equipment bore a notice requiring a specific minimum clearance to be maintained in front of it for safety. It was observed to be blocked by a cart parked closer than the minimum distance specified. The licensee indicated an effort would be made to raise the employees' concern for safety.
4. MC 592703B Independent Safeguards Inspection Effort

During the inspection of the Rockwell International Hot Laboratory (RIHL), ESG revealed that the decladding of coextruded Fermi fuel was likely to require use of a centerless grinder to adequately separate the zirconium cladding from the uranium metal. Such grinding will result in removal of some of the uranium from the fuel meat. The licensee indicated he planned to communicate with licensing early to facilitate handling problems expeditiously.

The inspection of the Plutonium Facility showed it to be essentially on standby with processing being limited to oxidizing depleted uranium carbide to uranium oxide to stabilize it.

It was noted that R. O. Williams, Jr. succeeded S. F. Iacobellis as Energy Systems Group President.

5. MC 585204 Facility Operations

No items of noncompliance were identified.

For the near term, ESG will continue to fabricate Al clad U•Al<sub>x</sub> alloy fuel plates through the end of Calendar year 1982.

Activities at RIHL are continuing at a relatively steady pace with EBR-II fuel decladding completed and the SEFOR fuel decladding operation expected to start in April 1982. Fermi fuel decladding is expected to follow the SEFOR operation. Current efforts are directed towards establishing the specific procedure for use in the Fermi fuel decladding.

6. MC 585206B Measurements and Statistics

No items of noncompliance were identified.

The licensee's control of his measurement systems were appropriately documented. The data generated from measurements was used by the statistician in establishing the values for the error components which were then appropriately propagated.

7. MC 585208B Shipper Receiver Differences

No items of noncompliance were identified.

The records reflect that the licensee ships SNM only to authorized recipients. He appropriately measures the SNM before shipment (destructively during processing and nondestructively after encapsulation or tamper sealing), and properly completes and dispatches the transfer document (Form NRC-741). Appropriate notification is provided when required.

The licensee appropriately measures SNM receipts. Shipper-receiver differences are statistically evaluated and an investigation initiated if the difference exceeds 50 grams U-235. No such differences have occurred on receipts in the past year.

8. MC 585210B Storage and Internal Control

No items of noncompliance were identified.

The licensee's practices for storage and internal control generally followed his approved procedures. A few exceptions involved tamperproofing practices and were listed as examples of weaknesses in the noncompliance resulting from observations of the conduct of the physical inventory.

9. MC 585212 Physical Inventory

One item of noncompliance was identified.

In the course of evaluating the licensee's performance relative to the regulations and his approved FNMC plan the following observations were made:

10 CFR 70.51(f)(2)(ii) requires verification of the integrity of tamperproofing devices on containers. The licensee did not verify the integrity of tamperproofing seals when he inventoried MBA-01. This was identified as an item of noncompliance. Further, a container (3187-37-7527, TSS#153970 on voucher 10853) was measured and hermetically closed by a single individual thus a second person could not attest to the contents of the container as required by the licensee's procedure "Tamper-proofing Seal Use and Control RP 10.5 Rev. C" dated February 23, 1978 (Paragraph 3.4). Additionally, an inspector was able to identify one item as apparently inadequately sealed with a type E metal cup seal. The inadequacy stemmed from the wire loop being too loose when closed by the type E metal cup seal. The licensee, under the inspectors direction, successfully opened a similar container without damaging the tamperproofing seal. This container's U-235 content was subsequently remeasured by NDA using the barrel scanner. It was noted during the followup phase of the inspection that the container originally identified in the storage yard, L-22 (TSS#13209), was not remeasured within 30 days after the start of the physical inventory (another example of the weakness of the tamperproofing practices).

The foregoing represent departures from the licensee's previous practice of following approved procedures (which are still in effect).

The licensee has conducted physical inventories at the frequencies specified in Commission regulations.

The licensee adjusts the books to the results of the physical inventory as required.

10. Overchecks

Inspectors had an opportunity to observe the ten percent inventory overchecks conducted in Material Balance Areas (MBA) -20 analytical chemistry laboratory and MBA-01 production storage vault.

The overcheck is performed by members of the Nuclear Material Management Group. The check includes a random selection of items on inventory and a verification of the inventory tag number, item identification, numerical data and location information.

[REDACTED]

The inventory overcheck in MBA-01 amounted to an 18 percent overcheck. The randomness of the overcheck is not based on a statistical determination. The selections of locations are made at the discretion of the overcheck team and has built-in biases. For example, locations out of reach may not be chosen, unless a tall enough ladder or platform is available to use.

11. MC 585214B ID and LEID

No items of noncompliance were identified.

The limits of error (LEID) for the inventory differences since the last inspection were within regulatory constraints. The inventory differences reported were adjusted for prior period affects on a reasonable basis. The methods of determining the ID and its LEID were documented and the values obtained were traceable. Although the method of calculating the LEID differed somewhat from the approach of J. L. Jaech (Statistical Methods In Nuclear Material Control, (1973, USAEC) data had been processed by both methods and the comparison of the resultant LEID's indicated that the difference for this licensee's operation was inconsequential. The alternate method was significantly less rigorous and was subsequently used based on the inconsequential difference of the resultant LEIDs. Appropriate evaluation for covariant items was made and their exclusion from the LEID calculation was appropriate. The records reflecting the methodology and the data used were complete and readily available.

12. MC 585213B Inventory Verification

No items of noncompliance were identified.

Inventory verification involved NDA measurements of the masses and the 186 KeV gamma-ray intensities from the radioactive decay of Uranium-235 of the attribute items selected for verification. In all cases the licensee's equipment and standards were utilized in measurements. Samples of Uranium metal (U), Uranium Aluminum powders (UA1), Briquettes (compacted recycled UA1) and a scrap compact (UA1 + A1) and two scrap fuel plates were sent to New Brunswick Laboratory (NBL) for destructive chemical analyses of U and mass spectrometric determination of the U-235 isotopic abundances. The measured values of U and U-235 reported by NBL give further independent verification of the measurement systems calibration and of the inventory.

After the physical inventory, the number of attribute items from each stratum to be verified by NDA measurements was calculated in accordance with attribute sampling procedures. The equation used in these calculations follows:

$$S = N (1-B)^{1/z}$$



c. UAl<sub>x</sub> (Aluminum Clad) Plates

The 85 plates randomly selected from the 2928 item stratum (approximately 0.05 Kg U-235 per plate) were located, serial numbers verified and U-235 content measured by NDA. Plates were measured relative to designated licensee standards using the licensee's plate gamma scanner. The total measured difference was +1.4% (NRC-ESG). Fifteen scrap plates were randomly selected from a 178 item stratum, located, serial numbers verified and U-235 content measured by NDA (plate gamma scanner). The average difference between ESG's listed values and NRC's measured values was - 1.2 percent and shows consistency with product plates. Two additional scrap plates were selected for independent chemical analyses for U and U-235 at NBL. These plates were measured ten times each by NDA before shipment to NBL. The measured values and ESG's listed U contents are shown in Table I.

TABLE I

Uranium Content in Scrap Plates, grams

<u>ESG list</u>	<u>NRC NDA</u>	<u>NBL analysis</u>
11.61	11.50	11.6122
66.35	66.14	65.2723

The data shows excellent agreement between ESG's list and NBL's analyses. The NDA measurements are slightly biased, -.98 and -.19 percents, but verifies ESG's gamma scanner's 4 plate standards used in these measurements.

No defects were identified.

d. UAl<sub>x</sub> (Briquettes)

Two briquettes from two lots of briquettes were sampled for independent chemical analyses of U and U-235 at NBL. The lots were verified by gross mass measurements. The measured differences were not statistically significant.

No defects were identified.

e. Waste Drums

Four waste drums were selected for verification by remeasurement from the population of 294 items. The drums were selected to cover a range of U-235 content normally encountered. The licensee's NDA drum gamma scanner was used in the measurements. Standard drums were run to calibrate the measurement system during the verification measurements. The measurement differences averaged - 7.8%.

No defects were identified.



f. UAl<sub>x</sub> Al Compacts

This stratum contained 59 compacts, approximately 0.076 Kg U-235 per item, and 27 were selected for mass measurement verification. The measurement differences were not statistically significant. Two compacts were verified by gamma-ray counting with the SAM II.

No defects were identified.

g. Miscellaneous Items

Several miscellaneous items were checked by gamma-ray counting with the SAM II. These items were compact line clean out and pipe clean out materials, chemical laboratory wastes and metallurgy laboratory scrap. These measurements verified the presence of U-235, but not the quantity.

h. Conclusion

The inventory verification effort supports the assertion with 95% confidence that the inventory at Energy Systems Group of Rockwell International is free of gross defects totaling more than 5 formula kilograms of SNM based on the samples identified and measured in accordance with attribute sampling procedures. The samples submitted to the New Brunswick Laboratory have been analyzed and the reported values for U and U-235 support the inventory verification.

13. MC 585216B Records and Reports

No items of noncompliance were identified.

A routine records audit was performed on Energy Systems Group's special nuclear material transactions and material balance data for the semi annual periods of October 1, 1980 through March 31, 1981; and April 1 through September 30, 1981.

Trial balances and other summarized schedules developed from this data were used to make a comparative evaluation of the information contained in Energy Systems Group NRC-742 Material balance reports for the semi annual periods of the audit.

Other aspects of the audit included a review of inventory difference entries and a verification test of the data found in a random sampling of Energy Systems Group internal material vouchers.

14. MC 585218B Management of Material Control System

No items of noncompliance were identified.

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The management audit No. 1034 of the licensee's material control system dated March 19, 1981 was reviewed. It indicated minor nonconformances that were subsequently corrected. The reviews are conducted annually and the reviewers are independent enough to avoid conflicts of interest. The licensee's MC&A management system, staff, and procedures are in compliance with the license, CFR, and the licensee's FNMC plan.

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REGION V - ROUTE SLIP

ESG File

DIRECTOR'S OFFICE		INIT
Engelken		
Gilbert		
Smith		

INVESTIGATION		
Johnson, A.		
Shackleton		
Joukoff		
Power		

DIV. OF RES., REACTOR PROJ. AND ENGR. INSP.		
Crews		
Kellund		

REACTOR OPERATIONS BR.		
Sternberg		
Blair		

SECTION - 1		
Zwetzig		
Hornor		
Kirsch		
Johnson		

RESIDENT INSPECTORS		
Malmros		
Johnston		
Pate		
Miller		
Chaffee		
Fiorelli		

SECTION - 2		
Young		
Stewart		
Morrill		
Willett		

RESIDENT INSPECTORS		
Canter		
O'Brien		
Carlson		
Nendonca		

REACTOR CONSTRUCTION BR.		
Faulkenberry		
Muscat		

SECTION - 1		
Bishop		
Burdoin		
Eckhardt		
Hernandez		
Wagner		

RESIDENT INSPECTORS		
Vorderbrueggen		

SECTION - 2		
Dodds		
D'Angelo		
Elin		
Haist		
Narbut		

RESIDENT INSPECTORS		
Albert		
Toth		
Fell		

TECHNICAL INSPECTION		INIT
Spencer		
Kunihiro, State Liason		

RADIOLOGICAL SAFETY BR.		
Book		
Cosso		

REACTOR SECTION		
Wenslawski		
Cillis		
Fish		
Garcia		
Hamada		
Hankins		
North		
Scown		
Yuhas		

MATERIALS SECTION		
Thomas		
Cooley		
Grayson		
Pang		
Riedlinger		
Skov		
Zurakowski		

SAFEGUARDS BR.		
Norderhaug		
Barriga		

MATERIAL CONTROL		
Brock		
Nelson	2-16-82 GW	
Wieder		

PHYSICAL SECURITY		
Schuster		
Ivey		
McQueen		
Mortensen		
Schaefer		
Schwan		

PERFORMANCE APPRAISAL		
Woessner		
Hansen		

PUBLIC AFFAIRS		
Hanchett		
Zimmerman		


OPERATIONAL SUPPORT		INIT
Alexander		
Coyne		
Fleming		
Gomez		
Houston		
Humphreys		
Jursevskis		
Keith		
Llewellyn		
Miller		
Western		

WORD PROCESSING		
Noack		
Keast		
Nichols		

MANAGEMENT INFO SYSTEM		
Zollicoffer		
Beierle		

File: \_\_\_\_\_

*Get*

**ACTION**

*if you agree stavis response letter.*

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Action:

Standard Response letter

2-16-82