The informat. A on this page is considered to a appropriate for public disclosure pursuant to 10 CFR 2.790.

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 Sy	ystems Group, Rockwell International	
8900 De S	Soto Avenue	
Canoga Pa	ark, California 91304	
Facility Name: Ener	rgy Systems Group, Atomic International	
Inspection at: Head	dquarters, De Soto Facility	
Inspection Conducted	d: Oct. 19-24, Nov. 2-6 & 16-17 & 30, De	c. 1-4, 1981
Date of Last Materia	al Control and Accounting Inspection Vis	it: March 16-20, 1981
	Announced, Material Control and Accoun	ting
Inspectors: 18.0	L. Drock	1/14/82 Date Signed
Sie!	welch safeguards Auditor	Date Signed ///4/82 Date Signed ///4/82 Date Signed
Approved by: L. R.	11/01/0	1/14/87 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.

zep



DETAILS

copy H of 5 copies

THIS DOCUMENT IS NOT TO BE REPRODUCTO WITHOUT SPECIFIC APPROVAL OF IE.

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 meas rements, 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-Ol, his storage vault, on November 3, 1981.
- b. Fifteen barrels of waste, 55 gallon size, showed sufficient cor. Ison 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 <u>Acetone</u> 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

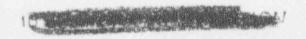
 Air Monitor (CAM) in the room where samples are drilled or cut
 from uranium metal would be advantageous. Technicians could be
 warned by a CAM of higher than acceptable levels of airborne radioactive
 particles during sampling operations. The licensee now uses a
 drill press to drill a sample from uranium metal pieces, and believes
 this operation does not warrent 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 5927038 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 oxiding 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 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 tampersafing practices and were listed as examples of weaknesses in the noncompliance resulting from observations of the conduct of the physical inventory.



NO.

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 tampersafing devices on containers. The licensee did not verify the integrity of tampersafing 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-safing 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 tampersafing 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 tampersafing 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.

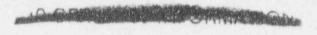
The licensee adjusts the books to the results of the physical inventory as required.

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-Ol 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.





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 A)uminum 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:

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



-6-

Where S = Number of attribute items to be verified

N = the item population in a stratum

B = 0.05 (the probability of not detecting at least

one defect in the stratum)

Z = GQ/W

GQ = goal quantity, 5Kg U-235 w = average Kg U-235 per item

The calculated number of items (S) for verification were selected from the computer listing of items in each stratum through the use of a random number generator. Locating each randomly selected item verified its presence, weighing the items verified the assigned quantity of material and the gamma-ray NDA measurement attested to the type of material and the quantity of U-235 in finished fuel plates.

a. Uranium Metal

The 18 cans of 93% Enriched Uranium metal, each containing approximately 6 Kg of U-235, in the form of pieces, were all verified by mass measurement using a calibrated balance. A piece selected from each can was measured for surface activity by using a Stabilized Assay Meter, Model II (SAM-II). The surface activity, the intensity of the 186 KeV gamma-ray from U-235 decay, of each piece from each can was consistent with the mean specific activity within 5%. Count rate variations were attributed to difference in the surface contours of each piece, these variations introduced differences in distances between the sample piece and detector. The average mass difference of 0.5 gram per container was not statistically significant.

Four cans were selected for independent analyses of U and U-235 by NBL. Duplicate samples of turnings, with average masses of 1.6g, were taken from each of the four cans.

No defects were identified.

b. UA1 Powder

The 11 cans of UAI powder, containing approximately 4.8 Kg U-235 per can, were all Verified by gross mass measurement using balances and the gamma-ray activity using SAM II. The specific gamma activity, (186 KeV) from the bottom surface of each can was within 8.2% of the mean specific activity of all the cans. The gross mass verification measurement of each can was within 1.1 grams on the average of the stated mass on the label.

Three cans were selected and sampled in duplicate, approximately 2 grams per sample, for independent analyses of U and U-235 at NBL.

No defects were identified.



c. UAl (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

whom Contact in Course Distance or

brantum content in scrap riates, grams			
ESG list	NRC NDA	NBL analysis	
11.61	11.50 66.14	11.6122 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, (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.

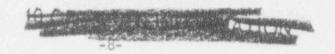
No defects were identified.

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. UA1 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.





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.



0 1F-Y-465

REGION V - ROUTE SLIP

		ESE File
DIRECTOR'S OFFICE INIT		ES G +1/0
[Engelken []		
Gilbert		
Smith		
INVESTIGATION	TECHNICAL INSPECTION INIT	OPERATIONAL SUPPORT INIT
Johnson, A.	Spencer	Alexander
Shackleton	Kunihiro, State Liason	Coyne
Joukoff		Fleming
Power	RADIOLOGICAL SAFETY BR.	Gome z
	Book	Houston
DIV. OF RES., REACTOR PROJ.	Cosso	Humphrevs
AND ENGR. INSP.		Jursevskis
Crevs	REACTOR SECTION	Keith
Kellund	Wenslawski	Llewellyn
REACTOR OPERATIONS BR.	Cillis	Miller
Sternberg	Fish	Western
Blair	Garcia	
I Totale	Hamada	WORD PROCESSING
SECTION - 1	Hankins	Noack
Zwetzig	Scown	Keast
Hornor	Yuhas	Nichols
Kirsch	Latin 19	Maria Camerana Maria
Johnson	MATERIALS SECTION	MANAGEMENT INFO SYSTEM
hande to the state of the state	Thomas	Zollicoffer
RESIDENT INSPECTORS	Cooley	Beierle
Malmros	Gravson	File:
Johnston	Pang	Control of the Contro
Pate	Riedlinger	
Miller	ISkov	
Chaffee	Zurakowski	
Fiorelli	Landa and the same	
	SAFEGUARDS 3R.	
SECTION - 2	Norderhaue	
Young	Barrigs	
Stewart	terminate and terminate and	Ald
Morrill	MATERIAL CO'TROL	91. 1
Willett	Brock	Merce V
	Nelson 2 18-82 GW	
RESIDENT INSPECTORS	Wieder	
Canter		
O'Brien	PHYSICAL SECUTITY	- 2 4 /
Carlson	Schuster	1 1 1 1 1 1
Mendenca	Ivev	11/1/10/0
	McQueen	
REACTOR CONSTRUCTION BR.	Mortensen	11 stav
Faulkenberry	Schaefer	of the same
Muscat	Schwan	1 111 11 1
SECTION - 1	APARONAL MAN AND AND AND AND AND AND AND AND AND A	ACTION star
Bishop	PERFORMANCE APPRAISAL	I Vinter Live
Burdein	Woessner	1/11/1
Eckhardt	Hansen	10.0
Hernandez	BURL TO APPARE	
Wagner	PUBLIC AFFAIRS	
Teaguet	Hanchett	
RESIDENT INSPECTORS	Zimmerman	
Vorderbrueggen		
1 1		
SECTION - 2		나는 그들은 이 경기를 들었는 말하셨다면 하게 되었다.
Dodds		Action:
D'Angelo		11011011
Elin		
Haist		Standard Response lotter
Narbut		The state of the s
	the transfer of the same of th	
		2-16-32
RESIDENT INSPECTORS		
Albert		
Toth		
Fei1		