

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No.: 50-05/92-01 and
70-113/92-01

Docket Nos.: 50-05
70-113

License Nos.: R-2
SNM-95

Licensee: The Pennsylvania State University
University Park, Pennsylvania 16802

Facility Name: The Pennsylvania State University

Inspection At: University Park Campus

Inspection Conducted: June 23-26, 1992

Type of Inspection: Announced, Material Control and Accounting (MC&A), and
Physical Security

Inspector: *Arthur Della Ratta* 7-24-92
A. Della Ratta, Physical Security Inspector Date

Approved By: *R. R. Keimig* 7-24-92
R. R. Keimig, Chief, Safeguards Section, DRSS Date

Areas Inspected: Nuclear material control and accounting and physical security, including: organization and operation; shipping and receiving; storage and internal controls; inventory; records and reports; and physical protection measures for special nuclear material (SNM) of low strategic significance.

Results: The licensee's programs were directed toward the protection of public health and safety and were found to be in compliance with the NRC requirements in the areas inspected. No safety concerns or violations of regulatory requirements were identified.

DETAILS

1.0 Key Licensee Personnel Contacted

- *E. Klevans, Professor and Department Head Nuclear Engineering
- *M. Voth, Director, Penn State Breazeale Reactor
- *L. Mullinger, Compliance Coordinator
- *R. Granlund, University Health Physicist
- *P. Boyle, Nuclear Material Representative
- *T. Flinchbaugh, Operations Manager
- *E. Augustine, Health Physicist Assistant
- C. Lutz, Security Shift Supervisor, Campus Police
- D. Neff, Dispatcher, Campus Police

* denotes presence at exit interview

2.0 Material Control and Accounting

2.1 Organization and Operation

The inspector verified through a review of records that the licensee maintained nuclear material control procedures that are documented in a manual entitled "Rules and Procedures for the Use of Radioactive Material at the Pennsylvania State University." Custody of all special nuclear material (SNM) and management of the nuclear material control and accountability program is the responsibility of the university Health Physicist.

Annual audits of the nuclear material control practices were performed by the licensee during 1988, 1989, 1990 and 1991. However, the inspector noted that the results of recent audits were neither formally documented nor reported to the Senior Vice President for Research and Dean of the Graduate School (Sr. V.P.) or were not reported to the Sr. V.P. in a timely manner after the audits were completed. The results of the 1989 audit are presently being documented and will be reported to the Sr. V.P. by July 3, 1992; the results of the 1990 and 1991 audits were not formally documented and reported to the Sr. V.P. until May 26, 1992. While the scope and depth of the audits were comprehensive and no adverse findings were identified, the inspector questioned why the audits after 1988 were not formally documented and reported in a timely manner. The licensee stated that it occurred through oversights. The licensee is presently in the process of developing a computerized follow-up program to prevent the recurrence. This matter will be reviewed during a subsequent inspection.

The inspector reviewed the licensee's records of annual "SNM Retraining" of all personnel who handle SNM. No problems were identified. In order to

assure that the training is completed on time, tracking of this training will be included in the computerized follow-up program described above.

2.2 Shipping and Receiving

The inspector determined through a review of records that the licensee maintained procedures to assure that all nuclear material shipped or received was accounted for accurately.

The inspector performed a review of all DOE/NRC Forms-741 generated during the period April 1, 1988 through March 31, 1992 to assure that each was properly signed, dispatched in a timely manner, and that the data were accurate. No discrepancies were identified.

2.3 Storage and Internal Control

The inspector determined through observations and review of records that the licensee was maintaining a system of storage and internal control which provided knowledge of the quantity, identity, and current location of all SNM within the facility. No discrepancies were identified.

2.4 Inventory

The licensee conducted a physical inventory of all special nuclear material in its possession at intervals not exceeding twelve months. This was substantiated by the inspector through a review of the physical inventory results for the years 1988 through 1991.

The inventories consisted of: (1) enriched uranium in the form of fuel elements, element sections, fission counters, samples and standards; (2) plutonium in the form of standards and sources; and, (3) uranium-233 in the form of foil scrap. All inventory items were identified by a unique number assigned by the licensee. Each inventory item was located in a locked area or was in the nuclear reactor with the exception of the plutonium-beryllium source #317. The licensee stated that this source was at the Beaver campus located at Monaco, Pennsylvania. This was confirmed by the inspector through a telephone call to the individual who was responsible for the source.

On June 25 and 26, 1992, the inspector verified the presence of certain selected items in the licensee's inventory by piece count, compared the results to the licensee's inventory listing, and reconciled them to the control records. No discrepancies were identified.

2.5 Records and Reports

The inspector reviewed the licensee's records, reports, and source data. All material Balance Reports (DOE/NRC Form-742) submitted by the licensee for the period April 1, 1988 to March 31, 1992 were reviewed for compliance with 10 CFR 70.53. Total uranium and uranium-235 depletion records were also reviewed. No discrepancies were identified.

Leak test records for seven sealed sources were reviewed for completeness and timeliness. No exceptions were identified.

The licensee's authorized possession limits were compared with the actual holdings and were in accordance with license conditions.

Exhibits I through III of this report summarize the nuclear material activity for the period April 1, 1988 through March 31, 1992.

3.0 General Physical Security Requirements for SNM of Low Strategic Significance

The inspector reviewed the licensee's protection of special nuclear material of low strategic significance for conformance to the NRC-approved Pennsylvania State University Security Plan (PSUSP), by examining barriers, access controls and procedures. The inspector also reviewed the following: seal records, annual review of the PSUSP test results for intrusion detection systems, results of responses to security incidents, and the results of the physical inventory of unused locks, cores, and keys. No discrepancies were identified.

4.0 Exit Meeting

The inspector met with the licensee representatives indicated in Section 1.0 on June 26, 1992 and summarized the scope and findings of this inspection.

EXHIBIT 1

The Pennsylvania State University

Docket No. 50-05 License No. R-2

Docket No. 70-113 License No. SNM-95

Material Balance for Period April 1, 1988 - March 31, 1992

Reporting Identification Symbol: CDW Reporting Unit: Grams

ENRICHED URANIUM

	<u>Element</u>	<u>Isotope</u>
Beginning Inventory: (April 1, 1988)	936,350	69,076
Receipts:	-0-	-0-
Material to Account For:	<u>936,350</u>	<u>69,076</u>
Removals:		
Internal Book Transfer to ZRV:	936,347	69,073
Shipments:	-0-	-0-
Fission and Transmutation:	3	3
Inventory Difference:	-0-	-0-
Ending Inventory: (March 31, 1992)	<u>-0-</u>	<u>-0-</u>
Material Accounted For:	<u>936,350</u>	<u>69,076</u>

EXHIBIT II

The Pennsylvania State University

Docket No. 50-05 License No. R-2

Docket No. 70-113 License No. SNM-95

Material Balance for Period April 1, 1988 - March 31, 1992

Reporting Identification Symbol: ZRV Reporting Unit: Grams

ENRICHED URANIUM

	<u>Element</u>	<u>Isotope</u>
Beginning Inventory: (April 1, 1988)	33	31
Receipts:	488	100
Internal Book Transfer from CDW:	936,347	69,073
Material to Account For:	<u>936,868</u>	<u>69,204</u>
Removals:		
Shipments:	4	4
Fission and Transmutation:	48	54
Inventory Difference: (Rounding)	(2)	(1)
Ending Inventory: (March 31, 1992)	<u>936,818</u>	<u>69,147</u>
Material Accounted For:	<u>936,868</u>	<u>69,204</u>

EXHIBIT III

The Pennsylvania State University

Docket No. 70-113 License No. SNM-95

Material Balance for Period April 1, 1988 - March 31, 1992

Reporting Identification Symbol: ZRV Reporting Unit: Grams

	<u>ENRICHED URANIUM-233</u>		<u>PLUTONIUM</u>	
	<u>Element</u>	<u>Isotope</u>	<u>Element</u>	<u>Isotope</u>
Beginning Inventory: (April 1, 1988)	2	2	173	167
Receipts:	<u>-0-</u>	<u>-0-</u>	<u>16</u>	<u>16</u>
Material to Account For:	<u>2</u>	<u>2</u>	<u>189</u>	<u>183</u>
Removals:				
Shipments:	<u>-0-</u>	<u>-0-</u>	16	16
Inventory Difference:	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
Ending Inventory: (March 31, 1992)	<u>2</u>	<u>2</u>	<u>173</u>	<u>167</u>
Material Accounted For:	<u>2</u>	<u>2</u>	<u>189</u>	<u>183</u>