

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-05/84-01
70-113/84-01

Docket Nos. 50-05
70-113

License Nos. R-2 Priority -- Category --
SNM-95

Licensee: The Pennsylvania State University
University Park, Pennsylvania 16802

Facility Name: The Pennsylvania State University

Inspection At: University Park Campus

Inspection Conducted: May 7-11, 1984

Date of Last Material Control and Accounting Inspection: January 10-14, 1983

Type of Inspection: Unannounced Material Control and Accounting

Inspectors: A. Della Ratta 5-29-84
A. Della Ratta, Safeguards Auditor date

Approved by: R.R. Keimig 5-29-84
R.R. Keimig, Chief, Safeguards Section date

Inspection Summary: Inspection on May 7-11, 1984 (Combined Report Nos. 50-05/84-01 and 70-113/84-01)

Areas Inspected: Facility Organization and Operation, Measurement and Controls, Shipping and Receiving, Storage and Internal Control, Physical Inventory, and Records and Reports. The inspection involved 30 inspector-hours onsite by one NRC inspector and was begun during the regular hours.

Results: The Licensee was in compliance with NRC requirements within the area examined.

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DETAILS

1. Persons Contacted

- * R.G. Cunningham, Vice President for Research and Graduate Studies
- I.B. McMaster, Deputy Director, Breazeale Nuclear Reactor
- * R.W. Granlund, University Health Physicist
- * E. Augustine, Health Physics Assistant
- R.E. Totenbier, SNM Controller

- * present at exit interview

2. 30703 - Exit Interview

The inspector met with the licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on May 11, 1984. The inspector summarized the scope and the findings of the inspection. At no time during the inspection was written material provided to the licensee by the inspector.

3. 92713 - Independent Inspection Effort

Independent inspection effort was conducted by direct observations, discussions with licensee personnel, and review of records. Leak test records for seven sealed sources were reviewed for completeness and timeliness. No exceptions were noted.

4. 85102 - Material Control and Accounting

a. Organization and Operation

The licensee has nuclear material control procedures documented in a manual entitled "Rules and Procedures for the use of Radioactive Material at the Pennsylvania State University". Custody of all SNM and the management of the nuclear material control and accountability program is the responsibility of the university Health Physicist.

Annual audits of nuclear material control practices were performed by the Manager of Safety during 1982 and 1983. Written reports were issued to the Vice President for Research and Graduate Studies on December 20, 1982 and December 12, 1983, respectively. There were no deficient practices disclosed in the audit reports.

b. Measurement and Controls

The licensee determined burn-up of enriched uranium fuel used in the nuclear reactor. The burn-up determination was performed quarterly and was reflected semi-annually on the DOE/NRC Form-742. The inspector determined the decrease of enriched uranium from reactor log records for the period October 1, 1982 through March 31, 1984. There

were no differences between the licensee's values and those determined by the inspector.

c. Shipping and Receiving

The licensee has maintained procedures to assure that all SNM received or shipped was accurately accounted for. One receipt and five shipments of SNM were made during the period covered by this inspection. No discrepancies were identified.

d. Storage and Internal Control

The licensee has maintained a system of storage and internal control of SNM, which provides for knowledge of the quantity, identity, and location of SNM within the facility.

e. Physical Inventory

The licensee conducted a physical inventory of all special nuclear material in his possession at intervals not exceeding twelve months. This was substantiated by the inspector upon review of the physical inventory results for 1982 and 1983.

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 the nuclear reactor. Plutonium beryllium source #317 was on the Altoona campus.

The inspector verified the presence of each of the items in the licensee's inventory by piece count and compared the results to the licensee's inventory listing and reconciled to the control records. No discrepancies were noted.

The university Health Physicist is in the process of writing detailed physical inventory instructions to be used by the inventory teams during the next physical inventory.

f. Records and Reports

The licensee's records and reports were audited for the period October 1, 1982 through March 31, 1984. This included a review of all Nuclear Material Transaction Reports (DOE/NRC Form-741), Material Status Reports (DOE/NRC Form-742), and underlying data issued during the audit period.

Records and reports were maintained in accordance with the licensee's procedures and applicable regulatory requirements.

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 summarizes the nuclear material activity for the period October 1, 1982 through March 31, 1984.

EXHIBIT I

Pennsylvania State University

Docket No. 50-05 License No. R-2
Docket No. 70-113 License No. SNM-95

Material Balance for Period: October 1, 1982 - March 31, 1984

Reporting Identification Symbol: CDW

Reporting Unit: grams

ENRICHED URANIUM

	<u>Element</u>	<u>Isotope</u>
Beginning Inventory: (October 1, 1982)	932964	68980
Receipts:	1930	383
	<u> </u>	<u> </u>
Material to Account For:	<u>934894</u>	<u>69363</u>
Removals:		
Shipments:	- 0 -	- 0 -
Fission and Transmutation:	16	18
Inventory Difference: (Rounding)	- 0 -	(1)
Ending Inventory: (March 31, 1984)	<u>934878</u>	<u>69346</u>
Material Accounted For:	<u>934894</u>	<u>69363</u>

EXHIBIT II

Pennsylvania State University

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

Material Balance for Period: October 1, 1982 - March 31, 1984

Reporting Identification Symbol: ZRV

Reporting Unit: grams

	<u>ENRICHED URANIUM</u>		<u>PLUTONIUM</u>	
	<u>Element</u>	<u>Isotope</u>	<u>Element</u>	<u>Isotope</u>
Beginning Inventory: (October 1, 1982)	35	32	205	197
Receipts:	<u>*</u>	<u>*</u>	<u>- 0 -</u>	<u>- 0 -</u>
Material to Account For:	<u>35</u>	<u>32</u>	<u>205</u>	<u>197</u>
Removals:				
Shipments:	1	1	32	30
Inventory Difference: (Rounding)	(1)	(1)	<u>- 0 -</u>	<u>- 0 -</u>
Ending Inventory: (March 31, 1984)	<u>35</u>	<u>32</u>	<u>173</u>	<u>167</u>
Material Accounted For:	<u>35</u>	<u>32</u>	<u>205</u>	<u>197</u>

EXHIBIT III

Pennsylvania State University

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

Material Balance for Period: October 1, 1982 - March 31, 1984

Reporting Identification Symbol: ZRV

Reporting Unit: grams

ENRICHED URANIUM-233

	<u>Element</u>	<u>Isotope</u>
Beginning Inventory: (October 1, 1982)	2	2
Receipts:	<u>- 0 -</u>	<u>- 0 -</u>
Material to Account For:	<u>2</u>	<u>2</u>
Removals:	- 0 -	- 0 -
Ending Inventory: (March 31, 1984)	<u>2</u>	<u>2</u>
Material Accounted For:	<u>2</u>	<u>2</u>