

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-05/88-02
70-113/88-01

Docket Nos. 50-05
70-113

License Nos. R-2
SNM-95

Safeguards Group III

Licensee: The Pennsylvania State University
University Park, Pennsylvania 16802

Facility Name: The Pennsylvania State University

Inspection At: University Park Campus

Inspection Conducted: May 3-6, 1988

Type of Inspection: Unannounced Material Control, Accounting and
Physical Security

Inspector: *A. Della Ratta* 6-23-88
A. Della Ratta, Safeguards Auditor date

Approved by: *R. R. Keimig* 6-28-88
R. R. Keimig, Chief, Safeguards Section date
DRSS

Inspection Summary: Inspection on May 3-6, 1988 (Combined Inspection Report
Nos. 50-05/88-02 and 70-113/88-01

Areas Inspected: Nuclear material control, 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 of low strategic significance.

Results: The licensee was in compliance with NRC requirements in the areas inspected.

DETAILS

1. Key Persons Contacted

- *R. McCarl, Director, Intercollege Research Programs (IRP)
- @*M. Voth, Director, Penn State Braezeale Reactor
- @I. McMaster, Deputy Director, Penn State Braezeale Reactor
- *R. Granlund, University Health Physicist
- *P. Boyle, Health Physics Assistant
- @T. Flinchbaugh, Operations Supervisor (SNM Controller)
- @D. Vonada, Electronic and Mechanical Support Supervisor
- J. Bonner, Gamma Irradiation Facility Supervisor
- C. Lutz, Supervisor, University Police Services

*Present at the material control and accounting exit interview.

@Present at the physical security exit interview.

2. Licensee Action On Previously Identified Enforcement Actions

(Closed) Violation (50-05/85-02-01): The licensee's Police Services' inspections of the facility were conducted less frequently than specified in the Pennsylvania State University Security Plan (PSUSP). The inspector reviewed Police Services Building Check records and the reactor supervisor's log book for the period October 1, 1985 through March 31, 1988 and determined that Police Services had made the facility inspections, as required by the amended PSUSP, when the reactor crew was not at the facility.

(Closed) Violation (50-05/85-02-02): Failure to have a facility alarm system of the type as described in the PSUSP. The inspector observed that the licensee's facility currently has an alarm system as described in the amended PSUSP.

3. Material Control and Accounting

a. 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 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 1984, 1985, 1986, and 1987. Written reports were issued to the Vice President for Research and Dean of the Graduate School on December 21, 1984, December 19, 1985, December 22, 1986, and December 22, 1987, respectively. There were no deficient practices disclosed in the audit reports.

b. 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 accurately accounted for. One receipt and three shipments of SNM were made during the period of April 1, 1984 through March 31, 1988. No discrepancies were identified.

c. Storage and Internal Control

The inspector determined through observations and review of records that the licensee was maintaining a system of storage and internal controls that provided the quantity, identity, and current location of all SNM within the facility.

d. 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 upon review of the physical inventory results for the years 1984 through 1987.

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 at the Beaver campus located at Monaco, Pennsylvania.

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 noted.

e. 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, 1984, to March 31, 1988 were reviewed for compliance with 10 CFR 70.53. Total uranium and uranium 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 noted.

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 April 1, 1984 through March 31, 1988.

4. 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, and by observations of a licensee test of alarm system features. The inspector also reviewed the following: seal records, annual review of the PSUSP test results for intrusion detection systems, results of response to security incidents, and the results of the physical inventory of unused locks, cores, and keys. The following discrepancies were noted:

The physical inventory of unused locks, cores and keys was conducted annually and documented by the licensee. However, the inspector determined that, for the unused locks and cores, there was no record of a reconciliation to the total number of locks and cores at the facility.

Although the inventory was accomplished in accordance with the PSUSP, the inspector suggested that the licensee reconcile the unused locks and cores to the total number of locks and cores at the facility in order to maintain overall control of the locks and cores. The licensee committed to accomplish this. This will be reviewed during a subsequent inspection.

The licensee is presently in the process of completing a revision of its PSUSP. Regulatory Guide 5.59, Revision I, dated February 1983 is being used as guidance in preparing this revision, which will contain the requirements for safeguarding special nuclear material of low strategic significance, as stated in Title 10 CFR 73, Section 73.67.

5. Exit Interview

The inspector met with the licensee representatives indicated in paragraph 1 on May 6, 1988 and summarized the scope and findings of the inspection.

At no time during this inspection was written material provided to the licensee by the inspector.

EXHIBIT I

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, 1984 - March 31, 1988

Reporting Identification Symbol: CDW

Reporting Unit: grams

ENRICHED URANIUM

	<u>Element</u>	<u>Isotope</u>
Beginning Inventory: (April 1, 1984)	934,878	69,346
Receipts:	2,227	442
Material to Account For:	<u>937,105</u>	<u>69,788</u>
Removals:		
Shipments:	716	668
Fission and Transmutation:	38	44
Inventory Difference: (Rounding)	1	-0-
Ending Inventory: (March 31, 1988)	<u>936,350</u>	<u>69,076</u>
Material Accounted For:	<u>937,105</u>	<u>69,788</u>

EXHIBIT II

The Pennsylvania State University

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

Material Balance for Period April 1, 1984 - March 31, 1988

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: (April 1, 1984)	35	32	173	167
Receipts:	<u>- 0 -</u>	<u>- 0 -</u>	<u>- 0 -</u>	<u>- 0 -</u>
Material to Account For:	<u>35</u>	<u>32</u>	<u>173</u>	<u>167</u>
Removals:				
Shipments:	2	1	- 0 -	- 0 -
Inventory Difference:	- 0 -	- 0 -	- 0 -	- 0 -
Ending Inventory (March 31, 1988)	<u>33</u>	<u>31</u>	<u>173</u>	<u>167</u>
Material Accounted For:	<u>35</u>	<u>32</u>	<u>173</u>	<u>167</u>

EXHIBIT III

The Pennsylvania State University

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

Material Balance for Period April 1, 1984 - March 31, 1988

Reporting Identification Symbol: ZRV Reporting Unit: grams

ENRICHED URANIUM-233

	<u>Element</u>	<u>Isotope</u>
Beginning Inventory: (April 1, 1984)	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, 1988)	<u>2</u>	<u>2</u>
Material Accounted For:	<u>2</u>	<u>2</u>