

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report/License Nos.: 50-20/95-03/R-37 and 70-938/95-01/SNM-986

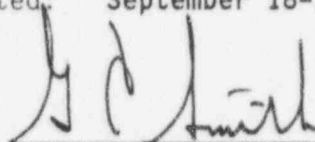
Licensee: Massachusetts Institute of Technology
138 Albany Street
Cambridge, Massachusetts 02139

Facility Name: MIT Nuclear Reactor

Inspection At: Cambridge, Massachusetts

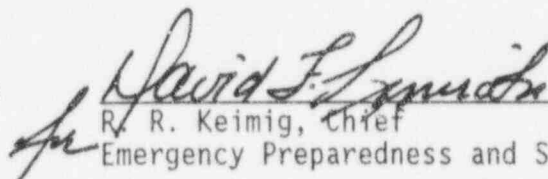
Inspection Conducted: September 18-19, 1995

Inspector:



G. C. Smith, Senior Physical Security Inspector

Approved by:



R. R. Keimig, Chief
Emergency Preparedness and Safeguards Branch

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

Results: The licensee's programs were directed toward the protection of the public health and safety. No safety concerns or violations of NRC requirements were identified.

DETAILS

1.0 LICENSEE PERSONNEL CONTACTED

- * J. Bernard, Jr., Director of Operations
- * E. Lau, Assistant Superintendent of Operations
- * H. Bondar, Administrative Officer
- * T. Newton, Assistant Superintendent of Reactor Operations
- D. Carlson, Assistant Chief MIT Campus Police

- * Attended the exit interview.

Other personnel were also contacted or interviewed.

2.0 MATERIAL CONTROL AND ACCOUNTING

2.1 FACILITY OPERATION

The inspector verified through interviews with personnel and a review of records that the licensee was maintaining and implementing procedures, which are documented in the "Manual of Procedures and Instructions Related to Accountability for Source, Special Nuclear, and Certain Other Materials," dated April 1989, for the control and accounting of nuclear materials. Written statements of responsibility and authority were established for those positions with responsibility for Special Nuclear Material.

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 and received was accurately accounted for.

The inspector reviewed all DOE/NRC Form-741s generated from October 1, 1993, through March 30, 1995 to assure that each was properly signed, dispatched in a timely manner and that the data were accurate.

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 in the facility.

SNM storage areas were maintained and included in the reactor core, fuel pool, and new fuel storage vault and other areas that were appropriate for SNM contained in other than fuel.

2.4 INVENTORY

The inspector reviewed supporting records that showed physical inventories were conducted at least annually as required by 10 CFR 7.51(d). The licensee's last physical inventory was performed on October 15, 1994.

On September 19, 1995, the inspector performed an inventory verification which consisted of a piece count of all the irradiated fuel elements in the reactor pool. The inspector also verified other selected SNM items on the physical inventory listing.

2.5 RECORDS AND REPORTS

The inspector reviewed the licensee's records, reports, and source data. Material status reports (DOE/NRC Form 742), submitted by the licensee from October 1, 1993 through March 30, 1995, were reviewed for compliance with 10 CFR 70.53. Total uranium and uranium depletion records were also reviewed.

Exhibits I and II, attached to this report, summarized the licensee's nuclear material activities from October 1, 1993 through March 30, 1995.

No deficiencies were identified in the licensee's Material Control and Accounting program.

3.0 GENERAL PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIAL OF MODERATE STRATEGIC SIGNIFICANCE

The licensee's program for physical protection of SNM of moderate strategic significance was reviewed by the inspector and was found to conform to NRC requirements and the licensee's implementing procedures. Specific components of the program that were reviewed included: records and reports; security organization; key control; detection aids; physical barriers; procedures; and observation of licensee test of alarm system features. No violations were identified. However, the inspector noted that the NRC-approved Security Plan (the Plan) had not been revised or updated since 1989 and that some current practices were different than those described in the Plan. The licensee committed to submit a Plan revision that accurately reflects current operating practices prior to the end of the first quarter of 1996. The acceptability of the Plan revision will be reviewed by the NRC upon receipt.

4.0 EXIT INTERVIEW

The inspector met with licensee management denoted in Section 1.0 at the conclusion of this inspection on September 19, 1995. The scope and findings of the inspection were discussed at that time. The licensee acknowledged the findings.

EXHIBIT I

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DOCKET NOS. 50-20 AND 70-938
LICENSE NOS. R-37 AND SNM-986

Material Balance for Period: October 1, 1993 - March 30, 1995

Reporting Identification Symbol: XSP Reporting Units: Grams

Enriched Uranium

	<u>Element</u>	<u>Isotope</u>
Beginning Inventory: (October 1, 1993)	1,990,618	49,216
Receipts:	<u>4,358</u>	<u>4,065</u>
Material to Account For:	<u>1,994,986</u>	<u>53,281</u>
Removals:		
Shipments:	3,478	3,053
Fission and Transmutation:	1331	1,563
Inventory Difference:	2	(1)
Ending Inventory: (March 30, 1995)	<u>1,990,175</u>	<u>48,666</u>
Material Accounted For:	<u>1,990,175</u>	<u>48,666</u>

The licensee also has a foil containing less than one gram of U-233.

EXHIBIT II

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DOCKET NOS. 50-20 AND 70-938
LICENSE NOS. R-37 AND SNM-986

Material Balance for Period: October 1, 1993 - March 30, 1995

Reporting Identification Symbol: XSP Reporting Units: Grams

	<u>Plutonium</u>	
	<u>PU</u>	<u>PU 239 & 241</u>
Beginning Inventory: (April 1, 1992)	354	331
Receipts:	<u>-0-</u>	<u>-0-</u>
Material to Account For:	<u>354</u>	<u>331</u>
Removals:		
Shipments:	<u>-0-</u>	<u>-0-</u>
Ending Inventory: (March 30, 1995)	<u>354</u>	<u>331</u>
Material Accounted For:	<u>354</u>	<u>331</u>

The licensee also has three foils containing a total of less than a tenth of one gram of Pu-238.