

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report Nos. 50-20/84-02; 70-89/84-01;  
70-95/84-01; 70-938/84-01

Docket Nos. 50-20; 70-89;  
70-95; 70-938

License Nos. R-37; SNM-81;  
SNM-83; SNM-98

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

Facility Name: MIT Nuclear Reactor

Inspection At: Cambridge, Massachusetts

Inspection Conducted: May 7 and 8, 1984

Date of Last Material Control and Accounting Inspection: October 28-29, 1981

Type of Inspection: Unannounced Material Control and Accounting

Inspectors: G.C. Smith  
G.C. Smith, Physical Security  
Inspector

5/31/84  
date

J.M. Dunlap  
J.M. Dunlap, Physical Security  
Inspector

5/31/84  
date

Approved by: R.R. Keimig  
R.R. Keimig, Chief, Safeguards  
Section, Nuclear Material and  
Safeguards Branch

5-31-84  
date

Inspection Summary: Inspection on May 7 and 8, 1984 (Report Nos. 50-20/84-02;  
70-89/84-01; 70-95/84-01; and 70-938/84-01)

Areas Inspected: Facility Organization and Operation; Storage and Internal Control; Physical Inventory; and Records and Reports. The inspection involved 12 inspector-hours onsite by two regional-based inspectors.

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

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## DETAILS

### 1. Persons Contacted

- \* L. Clark, Jr., Director, Reactor Operations
- \* H. Bonder, Administrative Assistant
- K. Kwok, Assistant Superintendent

\* denotes those present at the exit interview

### 2. 30703 - Exit Interview

The inspectors met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on May 8, 1984. The inspector summarized the purpose, scope and findings of the inspection.

### 3. 92713 - Independent Inspection Effort

No violations were identified.

The inspector toured the facility to verify that the licensee's possession and use of special nuclear material were in accordance with NRC requirements.

### 4. 85102 - Material Control and Accounting

#### a. Facility Organization and Operation

The inspection was conducted through discussions with licensee management and review of the licensee's program for special nuclear material (SNM) control and accounting. No discrepancies were identified.

#### b. Shipping and Receiving

The inspection was conducted through review of all Nuclear Material Transaction Reports (NRC Form-741) against criteria for completing the form. During the period October 1, 1981, through March 31, 1984, eleven transactions occurred (4 receipts and 7 shipments). No discrepancies were identified during review of these transactions.

#### c. Storage and Internal Control

The licensee has maintained a system of storage and internal control of SNM which provides for current knowledge of the quantity and identity of all SNM within the facility. Perpetual inventory records are maintained for all SNM.

d. Physical Inventory

The licensee conducted annual physical inventories as required by 10 CFR 70.51(d).

The inspectors verified selected items on the facility physical inventory. The results of the inventory verification disclosed no discrepancies.

e. Records and Reports

The inspection was conducted through an audit of Material Status Reports (NRC Form-742) submitted for the period of October 1, 1981 through March 31, 1984, to verify compliance with 10 CFR 70.53.

The material balance summary for the period covered by this inspection is shown in Exhibit I for Enriched Uranium and Exhibit II for Plutonium. No discrepancies were noted.

EXHIBIT I

Material Balance Summary

Massachusetts Institute of Technology

RIS:CCP  
Enriched Uranium

October 1, 1981 - March 31, 1984

	<u>Uranium</u>	<u>Grams</u> <u>U-235</u>
Beginning Inventory (10/1/81)	5564777	86684
<u>Receipts</u>		
ZAZ-CCP-3 (11/12/81)	2717	2531
-4 (3/15/82)	2173	2025
-5 (8/2/82)	2174	2025
FCW-CCP-1 (8/18/83)	<u>3263</u>	<u>3039</u>
Material to Account For:	<u>5575104</u>	<u>96304</u>
<u>Removals</u>		
CCP-FVA-7 (9/8/82)	293503	4725
-8 (10/5/82)	534509	5431
-9 (2/25/83)	356339	3620
-10 (3/2/83)	178170	1810
-11 (6/3/83)	534438	6108
-12 (7/21/83)	534438	6108
-13 (9/19/83)	<u>314521</u>	<u>4770</u>
Burn up	2428	2850
Rounding	(1)	(4)
Ending Inventory	<u>2826759</u>	<u>60884</u>
Material to Account For:	<u>5575104</u>	<u>96304</u>

EXHIBIT II

Material Balance Summary

Massachusetts Institute of Technology

RIS:CCP  
Plutonium

October 1, 1981 - March 31, 1984

	<u>Pu</u>	<u>Grams</u>	<u>Pu 239 &amp; 241</u>
Beginning Inventory (10/1/81)	366		342
<u>Receipts</u>	<u>0</u>		<u>0</u>
Material to Account For:	<u>366</u>		<u>342</u>
<u>Removals</u>			
Shipments	0		0
Ending Inventory (3/3/84)	<u>366</u>		<u>342</u>
Material Accounted For:	<u>366</u>		<u>342</u>