

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION

Docket No: 50-407

License No: R-126

Report No: 50-407/98-202

Licensee: University of Utah

Facility: TRIGA Research Reactor in the Center for Excellence in Nuclear  
Technology, Engineering, and Research (CENTER)

Location: Merrill Engineering Building  
Salt Lake City, Utah

Dates: June 22-24, 1998

Inspector: Craig Bassett, Senior Non-Power Reactor Inspector

Approved by: Seymour H. Weiss, Director  
Non-Power Reactors and Decommissioning  
Project Directorate  
Division of Reactor Program Management  
Office of Nuclear Reactor Regulation

## EXECUTIVE SUMMARY

University of Utah  
TRIGA Research Reactor Facility  
NRC Inspection Report No.: 50-407/98-202

This routine, announced inspection consisted of a review of selected conditions and records since the last safeguards and security inspection and related discussions with licensee personnel. The licensee's programs were directed toward the protection of public health and safety and were found to be in compliance with NRC requirements. No safety concerns or violations of regulatory requirements were identified.

During the inspection the reactor was not operated because it was the beginning of the summer quarter.

### Audit and Review Program

- The audit and review program at the facility was being acceptably carried out.

### Physical Security

- The NRC-approved security program at the facility was acceptably implemented.

### Material Control and Accounting

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

## REPORT DETAILS

### Summary of Plant Status

Although the reactor was not operating during the inspection, a review of applicable records showed that the reactor continued to be used to support research, reactor operator training, and educational demonstrations. No safeguards events have occurred since the last inspection in the security area. No safety concerns were noted.

#### 1. Audit and Review Program (69001)

##### a. Inspection Scope

To verify that the licensee had established and conducted review and audit functions required by the Technical Specifications (TS), the inspector reviewed:

- the licensee's audit and review plan,
- the revised security plan, and
- logs, records, and reports.

##### b. Observations and Findings

The inspector determined that the licensee's audit and review program, entitled "University of Utah Center for Excellence in Nuclear Technology, Engineering, and Research Audit and Review Plan for NRC License R-126: TRIGA Nuclear Reactor (Docket No. 50-407)," Revision (Rev.) 1, dated February 28, 1996, was acceptable. Selected portions of the licensee's Physical Security Plan and implementing procedures are audited during monthly and semiannual audits of the ALARA and reactor operations programs.

##### c. Conclusion

The audit and review program at the facility was acceptably carried out with respect to safeguards and security.

#### 2. Physical Security (81401, 81402, 81431)

##### a. Inspection Scope

To verify compliance with the licensee's NRC-approved Physical Security Plan (PSP) and to assure that changes, if any, to the plan had not reduced its overall effectiveness, the inspector reviewed:

- logs, records, and reports,
- security organization,
- response force and protocol,
- key control,
- detection aids,
- physical barriers,
- screening and access controls,



- annual emergency training records,
- provisions for contingencies, and
- written procedures.

b. Observations and Findings

The inspector determined that the licensee's physical protection program conformed to NRC requirements and the licensee's PSP and implementing procedures. All aspects of the program reviewed were being completed and no concerns were identified.

c. Conclusion

The NRC-approved security program at the facility was acceptably implemented.

**3. Material Control and Accounting (85102)**

a. Inspection Scope

To verify compliance with 10 CFR 70, the inspector reviewed:

- storage areas,
- procedures for tracking the quantity, identity, and location of Special Nuclear Material (SNM),
- annual inventory results, and
- associated records and reports.

b. Observations and Findings

The inspector verified through a review of records that the licensee was maintaining and implementing nuclear material control procedures documented in procedures. Records showed that the nuclear material received at the facility was accurately accounted for and stored properly. The licensee had received one shipment of SNM but had made no shipments between October 1, 1995 and March 31, 1998.

Storage and accountability of SNM were accomplished through item control. All SNM was stored in designated areas that included the reactor core, reactor pool, and a storage vault.

Physical inventories were conducted at least annually as required by 10 CFR 70.51(d). The licensee's last inventory was completed on March 30, 1998.

Exhibits I and II (attached to this report) summarize the licensee's uranium and plutonium material balances from October 1, 1995 through March 30, 1998.

c. Conclusion

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

#### 4. Exit Meeting Summary

The inspection scope and results were summarized on June 24, 1998, with licensee representatives. The inspector discussed the findings for each area reviewed. The licensee acknowledged the findings presented.

## PARTIAL LIST OF PERSONS CONTACTED

### Licensee

D. Bird, Sergeant, University Police  
M. Krahenbuhl, Senior Reactor Operator  
D. Slaughter, Reactor Administrator and CENTER Director  
K. Weaver, Senior Reactor Operator

## INSPECTION PROCEDURES (IP) USED

IP 69001: Class II Non-Power Reactors  
IP 81401: Plans, Procedures, and Reviews  
IP 81402: Reports of Safeguards Events  
IP 81431: Fixed Site Physical Protection of Special Nuclear Material of Low Strategic Significance  
IP 85102: Material Control and Accounting - Reactors

## ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

None

### Closed

None

## LIST OF ACRONYMS USED

ALARA	As low as reasonably achievable
CENTER	Center for Excellence in Nuclear Technology, Engineering, and Research
CFR	Code of Federal Regulations
IP	Inspection Procedure
NRC	Nuclear Regulatory Commission
PSP	Physical Security Plan
SNM	Special Nuclear Material
TS	Technical Specifications



EXHIBIT I

UNIVERSITY OF UTAH TRIGA REACTOR FACILITY

Docket No. 50-407

License No. R-126

Material Balance for Period: October 1, 1995 - March 31, 1998

Reporting Identification Symbol: ZWW

Report Units: Grams

	<u>High Enriched Uranium</u>		<u>Plutonium</u>	
	<u>Element</u>	<u>Isotope</u>	<u>Element</u>	<u>Isotope</u>
<b>Beginning Inventory:</b> (October 1, 1995)	2	2	114	105
Receipts:	0	0	0	0
Production:	0	0	0	0
<u>Material to Account for:</u>	<u>2*</u>	<u>2*</u>	<u>114**</u>	<u>105**</u>
Removals:				
Shipments:	0	0	0	0
Fission and Transmutation:	0	0	0	0
Inventory Difference:	0	0	0	0
Decay:	0	0	0	0
Total Removals:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<b>Ending Inventory:</b> (March 30, 1998)	<u>2</u>	<u>2</u>	<u>114</u>	<u>105</u>

\* = Contained in fission chambers

\*\* = Contained in the licensee's PuBr<sub>3</sub> sources

EXHIBIT II

UNIVERSITY OF UTAH TRIGA REACTOR FACILITY

Docket No. 50-407

License No. R-126

Material Balance for Period: October 1, 1995 - March 30, 1998

Reporting Identification Symbol: ZWW

Report Units: Grams

	<u>Low Enriched Uranium</u>	
	<u>Element</u>	<u>Isotope</u>
<b>Beginning Inventory:</b> (October 1, 1995)	25561	4990
Receipts:		
From DOE	767	151
Production:	0	0
<u>Material to Account for:</u>	<u>26328</u>	<u>5141</u>
Removals:		
Shipments:	0	0
Fission and Transmutation:	-417*	-417 *
Inventory Difference:	0	0
Decay:	0	0
Total Removals:	<u>-417</u>	<u>-417</u>
<b>Ending Inventory:</b> (March 30, 1998)	<u>25911</u>	<u>4724</u>

\* = An adjustment in the amount of Uranium-235 present in the fuel elements to account for burnup that occurred on the fuel before it was ever used at the University of Utah's TRIGA Reactor Facility.