

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Inspection Report: 50-262/92-01

Operating License: R-109

Licensee: Brigham Young University  
Provo, Utah 84602

Facility Name: L-77 Research Reactor Facility

Inspection At: Provo, Utah

Inspection Conducted: November 30 through December 1, 1992

Inspector: A. D. Gaines, Radiation Specialist  
Facilities Inspection Programs Section

Approved:

*B. Murray*  
B. Murray, Chief, Facilities Inspection  
Programs Section

*12/9/92*  
Date

Inspection Summary

Areas Inspected: Routine, announced inspection of the radiation protection program as it pertained to the decommissioning of the reactor.

Results:

- Proper personnel monitoring was provided for personnel involved with decommissioning activities (paragraph 1.2.1).
- Radiation and contamination surveys were properly performed and documented (paragraph 1.2.2).
- Proper calibration and quality control checks were performed on radiation detection instrumentation (paragraph 1.2.3).
- Areas were correctly posted and controlled (paragraph 1.2.4).
- Proper 10 CFR 19.12 instructions were provided for radiation workers (paragraph 1.2.5).
- The Decommissioning Committee provided proper oversight of decommissioning activities (paragraph 1.3).

Summary of Inspection Findings:

- No violations or deviations were identified.

Attachment:

Attachment 1 - Persons Contacted and Exit Meeting

## DETAILS

### **1 CLASS II NON-POWER REACTORS (40750)**

The licensee's program was inspected to determine compliance with 10 CFR Parts 19 and 20, and agreement with the Order Approving Decommissioning Plan and Authorizing Decommissioning issued July 23, 1992.

#### **1.1 Background**

The L-77 Research Reactor was last operated on May 11, 1982. The reactor was defueled on May 5, 1987, and the fuel shipped to the Idaho National Engineering Laboratory. An Order Approving Decommissioning Plan and Authorizing Decommissioning - was issued July 23, 1992.

On October 20, 1992, the licensee's Decommissioning Committee gave approval to remove shielding water and cut up the shield assembly to remove the core vessel. The licensee had cut up the shield assembly and placed the core vessel in a 55-gallon drum which was stored in the licensee's radioactive waste storage facility. The licensee had packaged some of the radioactive waste from decommissioning, but none of the waste had been shipped offsite for disposal. The next decommissioning activities include further cleanup of the facility, removal of material and equipment, and a final radiation survey. The licensee expects to have the final radiation survey completed by January 31, 1993.

#### **1.1 Organizational Changes**

The inspector reviewed the licensee's decommissioning organizational structure and noted that it conformed to their NRC-approved decommissioning plan.

#### **1.2 Health Physics**

##### **1.2.1 Personnel Monitoring**

The licensee used vendor-supplied personnel dosimetry for all personnel involved in decommissioning activities. Personnel monitoring results for the period when decommissioning activities were performed had not been received from the vendor at the time of this inspection.

##### **1.2.2 Radiation Surveying, Sampling, and Monitoring**

The inspector reviewed selected radiation and contamination surveys performed during decommissioning activities. The licensee had performed the necessary surveys to document radiation and contamination levels prior to and during various work activities. Survey records contained all required information.

The inspector performed radiation surveys of the nuclear reactor building. The licensee was not finished with decommissioning activities and, therefore, had not performed a final radiation survey. The inspector's surveys were performed to independently verify facility radiological condition at the time of this inspection. The radiological surveys performed included direct

measurements of beta and gamma radiation levels. Measurements of removable and nonremovable alpha and beta contamination were also made.

The inspector determined that the general background direct gamma radiation levels associated with the facility were 8 to 10 micro Roentgen per hour ( $\mu\text{R/hr}$ ). Some of the walls had background levels of 12 to 14  $\mu\text{R/hr}$ . The inspector identified two localized "hot spots". One small area on the wall by an electrical junction box was approximately 180  $\mu\text{R/hr}$ , the other area was on a lab bench and was approximately 200  $\mu\text{R/hr}$ . The Radiation Safety Officer was with the inspector during the surveys and noted the areas for further review. No areas were identified that were above the background levels for fixed beta radiation.

The inspector performed surveys to identify removable alpha and beta contamination using conventional paper smear techniques. Smear surveys were taken over a nominal 100 square centimeters and analyzed for alpha and beta radioactivity. The smears were taken on the floor where the reactor had been located. No removable radioactive contamination levels above background levels were identified.

#### 1.2.3 Radiological Monitoring Instrumentation Calibration

The licensee contracted with a radiation survey instrument vendor to calibrate the survey instruments used for decommissioning surveys. The inspector verified through records review that instruments were properly calibrated and that the licensee performed the appropriate quality control checks on the instruments as required in the decommissioning plan.

#### 1.2.4 Posting

The inspector verified that notices to workers were properly posted in a sufficient number of places to permit workers to observe them.

#### 1.2.5 Instruction of Workers

The inspector reviewed the course material provided to individuals who worked on decommissioning activities. The material was presented as part of the 8 hours of radiation and safety training session that workers who had no previous training had to complete prior to working on decommissioning activities. The material adequately cover the topics required by 10 CFR 19.12.

#### 1.3 Committee, Audits, and Reviews

The inspector reviewed Decommissioning Committee meeting minutes and decommissioning activity sheets. The inspector noted that the minutes and activity sheets indicated that the Decommissioning Committee was informed of and reviewed all decommissioning activities as required in the decommissioning plan.

#### 1.4 Conclusions

Proper personnel monitoring was provided for personnel involved with decommissioning activities.

Radiation and contamination surveys were properly performed and documented.

Proper calibration and quality control checks were performed on radiation detection instrumentation.

Areas were correctly posted and controlled.

Proper 10 CFR 19.12 instructions were provided for radiation workers.

The Decommissioning Committee provided proper oversight of decommissioning activities.

## ATTACHMENT 1

### 1 PERSONS CONTACTED

#### 1.1 Licensee Personnel

\*E. F. Jackson, Radiation Safety Officer  
\*F. W. Nelson, Safety Director  
C. E. Pugh, Chemical Hygiene Officer

\*Denotes personnel that attended the exit meeting.

### 2 EXIT MEETING

An exit meeting was conducted on December 1, 1992. During this meeting, the inspector reviewed the scope and findings of the report. The licensee did not identify as proprietary, any information provided to, or reviewed by the inspector.