

November 6, 2001

Mr. Stephen G. Frantz, Director
Reed Reactor Facility
Reed College
3203 S.E. Woodstock Boulevard
Portland, OR 97202-8199

SUBJECT: NRC INSPECTION REPORT NO. 50-288/2001-201

Dear Mr. Frantz:

This refers to the inspection conducted on October 15-18, 2001, at your Reed Reactor Facility. The enclosed report presents the results of that inspection.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress.

Based on the results of this inspection, no safety concerns or violations of NRC requirements were identified. No response to this letter is required.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/NRC/ADAMS/index.html>.

Should you have any questions concerning this inspection, please contact Mr. Craig Bassett at (404) 562-4712.

Sincerely,

/RA/

Patrick M. Madden, Section Chief
Non-Power Reactors and Financial Section
Operational Experience and
Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-288
License No. R-112

Enclosure: NRC Inspection Report 50-288/2001-201

cc w/encl: Please see next page

Reed College

Docket No. 50-288

cc:

Mayor of the City of Portland
1220 Southwest 5th Avenue
Portland, OR 97204

Reed College
ATTN: Dr. Ellen Stauder
Acting Dean of the Faculty
3203 S.E. Woodstock Boulevard
Portland, OR 97202-8199

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Portland, OR 97202-8199

Oregon Department of Energy
ATTN: David Stewart-Smith, Director
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625 Marion Street, N.E.
Salem, OR 97310

Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

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U.S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-288

License No: R-112

Report No: 50-288/2001-201

Licensee: Reed College

Facility: Reed Reactor Facility

Location: 3203 S.E. Woodstock Boulevard
Portland, OR 97202-8199

Dates: October 15-18, 2001

Inspector: Craig Bassett

Approved by: Eugene V. Imbro, Acting Chief
Operational Experience and
Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Reed College
Report No: 50-288/2001-201

This routine, announced inspection included onsite review of selected aspects of the following: organizational structure and functions; review and audit program; radiation protection and ALARA programs; environmental monitoring program; procedural controls; transportation of radioactive material program; the safeguards and security program; and the material control and accounting program.

Organizational Structure and Functions

- The organization and staffing remain in compliance with the requirements specified in the Technical Specifications.

Review and Audit Functions

- Audits were being conducted by the Reactor Operations Committee and the Radiation Safety Committee in compliance with the requirements specified in the Technical Specifications.

Radiation Protection Program

- Signs, notices and postings met the regulatory requirements.
- Personnel dosimetry was being worn as required and doses were well within the licensee's procedural action levels, and NRC's regulatory limits.
- Surveys were completed and documented acceptably to permit evaluation of the radiation hazards that might exist.
- Radiation monitoring equipment was being maintained and calibrated acceptably.
- The Radiation Protection and ALARA Programs satisfied regulatory requirements.

Environmental Monitoring Program

- Effluent monitoring satisfied licensee procedural and regulatory requirements and releases were calculated to be within the specified regulatory and Technical Specification limits.

Procedures

- Facility procedures were acceptably reviewed and approved.

Transportation of Radioactive Materials

- The program for shipping radioactive material satisfied regulatory requirements.

Safeguards and Security

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

Material Control and Accountability

- Special Nuclear Materials were acceptably controlled and inventoried.

REPORT DETAILS

Summary of Plant Status

The licensee's two hundred and fifty-kilowatt (250 kW) TRIGA Mark-I research reactor continues to be operated in support of undergraduate instruction and laboratory experiments, reactor operator training, and various types of research. During the inspection, the reactor was operated for a laboratory experiment.

1. Organizational Structure and Functions

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of the Technical Specification (TS) Amendment 6, dated September 17, 1998, Section I were being met:

- organization and staffing
- management responsibilities
- administrative controls

b. Observations and Findings

The organizational structure and staffing had not changed since the last NRC inspection in the area of radiation protection which occurred in December 1999 (Inspection Report No. 50-288/99-202). The organizational structure and staffing at the facility and as reported in the Annual Report was as required by the TS. Review of records verified that management responsibilities were administered as required by the TS and applicable procedures.

c. Conclusions

The licensee's organization and staffing remain in compliance with the requirements specified in the TS, Section I.

2. Review and Audit Functions

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the audits and reviews stipulated in the TS were being completed:

- safety review and audit records
- Reactor Operations Committee (ROC) meeting minutes
- Radiation Safety Committee (RSC) meeting minutes
- Reed Reactor Facility (RRF) Administrative Procedures
- TS responsibilities specified for the ROC and the RSC

b. Observations and Findings

The inspector reviewed the ROC and RSC meeting minutes from January 2000 to the present. These meeting minutes showed that each committee met as required by the TS with a quorum being present. Records showed that the safety reviews and audits conducted by the committees were completed at the TS required frequency. Topics of these reviews were also consistent with TS requirements to provide guidance, direction, and oversight, and to ensure acceptable use of the reactor.

The inspector noted that the safety reviews and audits and the associated findings were acceptably detailed and that the licensee responded and took corrective actions as needed.

c. Conclusions

The review and audit program satisfied TS requirements.

3. Radiation Protection Program

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with 10 CFR Part 20 and the applicable licensee TS requirements and procedures:

- radiological signs and posting
- routine surveys and monitoring
- dosimetry records
- maintenance and calibration of radiation monitoring instruments
- Radiation Protection and As Low As Reasonably Achievable (ALARA) Programs

The inspector also observed the use of dosimetry and radiation monitoring equipment during tours of the facility and conducted a radiation survey using NRC equipment.

b. Observations and Findings

(1) Postings and Notices

NRC Form 3, "Notice to Employees," notices were posted in accordance with 10 CFR 19.11. Caution signs, postings, and controls to radiation areas were as required in 10 CFR Part 20, Subpart J. The inspector verified that licensee personnel observed the indicated precautions for access the radiation areas.

(2) Dosimetry

Use of dosimeters and exit frisking practices were in accordance with radiation protection requirements. The licensee used a National Voluntary Laboratory

Accreditation Program (NVLAP) accredited vendor to process dosimetry. Radiological exposure records showed that occupational doses and doses to the public were well within 10 CFR Part 20 limitations. Training records showed that personnel were acceptably trained in radiation protection practices.

(3) Surveys

Through direct observation, the inspector determined that radiation monitoring and survey activities were being completed and the results were documented as required. A survey conducted by the inspector verified the survey results of the licensee.

(4) Radiation Monitoring Equipment

Equipment used for facility monitoring activities was maintained, calibrated, and used acceptably. The calibration of radiation monitoring equipment was typically completed by a staff member. Calibration frequency met TS requirements and records were maintained as required.

(5) Radiation Protection and ALARA Programs

The Radiation Protection and ALARA programs had not changed since the last inspection. The licensee reviewed the radiation protection program at least annually in accordance with 10 CFR 20.1101(c). The review included ALARA considerations and no weaknesses were reported.

The licensee did not require or use a respiratory protection program or planned special exposure program.

(6) Facility Tours

The inspector toured the Reactor Room and selected support laboratories and office areas. Control of radioactive material and control of access to radiation areas were acceptable.

c. Conclusions

Postings met regulatory requirements. Personnel dosimetry was being worn as required and doses were well within the licensee's procedural action levels and the NRC's regulatory limits. Surveys were completed and documented acceptably to permit evaluation of the radiation hazards that might exist. Radiation monitoring equipment was being acceptably maintained and calibrated. The Radiation Protection Program and the ALARA Program satisfied regulatory requirements.

4. Environmental Monitoring Program

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following:

- the environmental monitoring program
- release calculation records
- counting and analysis records
- annual reports

b. Observation and Findings

The program for the monitoring of radioactive liquid, gases, and solids was consistent with applicable regulatory requirements. Monitoring equipment was acceptably maintained and calibrated. Records were current and acceptably maintained.

Licensee records and calculations showed that the air emissions of radioactive material to the environment met the 10 millirem constraint specified in 10 CFR 20.1101(d).

Environmental soil and water samples were collected, prepared, and analyzed consistently with the procedural requirements. Laboratory equipment was maintained and calibrated acceptably. Data indicated that there was no measurable dose above background. This was acceptably documented in the Annual Reports. Observation of the facility found no new potential release paths.

c. Conclusion

Effluent monitoring satisfied license and regulatory requirements and releases were within the specified regulatory and TS limits.

5. Procedures

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following:

- administrative controls
- selected safety procedures
- procedural implementation

b. Observations and Findings

Controls of changes to procedures and the associated review and approval processes were as required. Training of personnel on procedures and changes was acceptable. Personnel conducted activities in accordance with applicable procedures. Records showed that procedures for potential malfunctions (e.g., radioactive releases and contaminations, and reactor equipment problems) were implemented as required.

c. Conclusions

Facility procedures were acceptably reviewed and approved.

6. Transportation

a. Inspection Scope (IP 86740)

The inspector interviewed licensee personnel and reviewed selected aspects of the following:

- radioactive materials shipping procedures
- radioactive materials transportation and transfer records

b. Observations and Findings

Through records reviews and discussions with licensee personnel, the inspector determined that various shipments of licensed material had been made since the last inspection. Appropriate shipment records had been completed and were being maintained as required. The records showed that the material had been properly described and classified, that the correct labeling had been provided, and that the contamination and radiation levels of the packages shipped had been recorded acceptably.

c. Conclusions

The program for shipments of radioactive material satisfied regulatory requirements.

7. Physical Security

a. Inspection Scope (IPs 81401, 81402, 81431)

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:

- the security organization
- logs, records, and reports
- lock and key control
- intruder detection and physical barriers
- access controls and 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. The security organization was as stipulated in the PSP, records were being maintained,

locks and keys were controlled as required, detection devices were maintained and tested as required, and access controls were in place.

c. Conclusion

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

8. Material Control and Accounting

a. Inspection Scope (IP 85102)

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

- storage areas
- tracking the quantity, identity, and location of Special Nuclear Material (SNM)
- annual inventory results
- accountability forms, records and reports

b. Observations and Findings

The annual inventories of special nuclear material had been completed. The material control and accountability program tracked locations and content of fuel and fission detectors under the research reactor license. The possession and use of SNM was limited to the locations and purposes authorized under the license. The material control and accountability forms (DOE/NRC Forms 741 and 742) were prepared and transmitted in a timely manner as required.

c. Conclusion

Special Nuclear Materials were acceptably controlled and inventoried.

9. Follow-up on Previously Identified Items

a. Inspection Scope (IP 92701)

The inspector reviewed the licensee's actions taken in response to previously identified Inspector Follow-up Items and Violations.

b. Observation and Findings

(Closed) Inspector Follow-up Item (IFI) 50-288/99-202-03 - Follow-up on the maintenance of detailed records of calibrations for all Radiation Area Monitors (RAMs).

During an inspection in 1999, a review of the calibration records for the Radiation Area Monitors (RAMs) used at the facility indicated that some of the records were not available. It was noted that the TS requires only one RAM, located in the reactor room, to be operable during reactor operation. The records for that RAM were being

maintained as required. The licensee indicated that, because the other RAMs were not TS-required equipment, close scrutiny and control of the records for those RAMs had not been maintained in the past. The failure to maintain calibration records was identified as a potential problem and the licensee had started to keep more detailed records of the calibration of all the RAMs in use at the facility. During this inspection it was verified that the calibration records for all the RAMs were being maintained and that the calibrations were being completed annually as required. This issue is considered closed.

c. Conclusion

One IFI was acceptably closed.

10. Exit Interview

The inspection scope and results were summarized on October 18, 2001, with members of licensee management. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. Although proprietary material was reviewed by the inspector during the inspection, none is included in this report.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Barnett, Training Supervisor
R. Burkland, Operations/Reactor Supervisor
S. Frantz, Director, Reactor Facility and Acting Radiation Safety Officer
M. Parrott, Reactor Health Physicist
E. Weis, Assistant Director, Reactor Facility

Other Personnel

M. O'Brien, Director of Community Safety, Reed College
J. Schmidt, Dispatcher, Community Safety, Reed College

INSPECTION PROCEDURES 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
IP 86740: Inspection of Transportation Activities
IP 92701: Follow-up

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

50-288/99-202-03 IFI Follow-up on the maintenance of detailed records concerning the calibration of all RAMs.

LIST OF ACRONYMS USED

ALARA As low as reasonably achievable
CFR Code of Federal Regulations
IFI Inspector Follow-up Item
IP Inspection Procedure
kW kilowatt
NRC Nuclear Regulatory Commission
NVLAP National Voluntary Laboratory Accreditation Program
PSP Physical Security Plan
RAM Radiation Area Monitor
ROC Reactor Operations Committee
RRF Reed Reactor Facility
RSC Radiation Safety Committee
SNM Special Nuclear Material

TS

Technical Specification