UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 15, 2022

Mr. Jerry Newhouse, Director
Reed College
Reed Research Reactor
3203 Southeast Woodstock Boulevard
Portland, OR 97202-8199

SUBJECT: REED COLLEGE – U.S. NUCLEAR REGULATORY COMMISSION ROUTINE SAFETY INSPECTION REPORT NO. 05000288/2022202

Dear Mr. Newhouse:

From April 25-27, 2022, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Reed Research Reactor facility. The enclosed report presents the results of that inspection, which were discussed on April 27, 2022, with you and members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records, observed various activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390, "Public inspections, exemptions, requests for withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (Agencywide Documents Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

If you have any questions concerning this inspection, please contact Kevin Roche at (301) 415-1554, or by electronic mail at Kevin.Roche@nrc.gov.

Sincerely,

Travis L. Tate, Chief
Non-Power Production and Utilization
Facility Oversight Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

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

Enclosure:
As stated

cc: w/enclosure: See next page

cc:

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

Dr. Kathryn C. Olsen, Dean of Faculty
Reed College
3203 SE Woodstock Boulevard
Portland, OR 97202-8199

Dr. Audrey Bilger, President
Reed College
3203 SE Woodstock Boulevard
Portland, OR 97202-8199

Mr. Maxwell Woods, Assistant Director
for Nuclear Safety & Emergency Preparedness
Oregon Department of Energy
550 Capitol Street N.E.
Salem, OR 97301

Program Director
Radiation Protection Services
Public Health Division
Oregon Health Authority
800 NE Oregon Street, Suite 640
Portland, OR 97232-2162

Test, Research and Training
Reactor Newsletter
Attention: Ms. Amber Johnson
Dept of Materials Science and Engineering
University of Maryland
4418 Stadium Drive
College Park, MD 20742-2115

SUBJECT: REED COLLEGE – U.S. NUCLEAR REGULATORY COMMISSION ROUTINE SAFETY INSPECTION REPORT NO. 05000288/2022202
DATED: JUNE 15, 2022

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

Docket No:	50-288
License No:	R-112
Report No:	05000288/2022202
Licensee:	Reed College
Facility:	Reed Research Reactor
Location:	Portland, OR
Dates:	April 25-27, 2022
Inspector:	Kevin Roche
Approved by:	Travis L. Tate, Chief Non-Power Production and Utilization Facility Oversight Branch Division of Advanced Reactors and Non-Power Production and Utilization Facilities Office of Nuclear Reactor Regulation

Enclosure

EXECUTIVE SUMMARY

Reed College
Reed Research Reactor
Report No. 05000288/2022202

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the Reed College (the licensee's) Class II 250 kilowatt research reactor safety program including: (1) procedures, (2) health physics, (3) design changes, (4) committees, audits and reviews, and (5) transportation, since the last U.S. Nuclear Regulatory Commission (NRC) inspection of these areas. The licensee's program was acceptably directed toward the protection of public health and safety and was generally in compliance with NRC requirements.

Procedures

- Facility procedures were acceptably reviewed, approved, and implemented as required by the Standard Operating Procedure.

Health Physics

- Surveys were accurately completed and documented to permit evaluation of the radiation hazards present as required by Technical Specifications (TSs) and the radiation protection program.

- Postings met the regulatory requirements specified in Title 10 of the *Code of Federal Regulations* (10 CFR) Parts 19, "Notices, Instructions and Reports To Workers: Inspection and Investigations," and 20, "Standards for Protection against Radiation."

- Personnel dosimetry was worn as required and doses were within the licensee's procedural action levels and NRC's regulatory limits.

- Radiation monitoring equipment was maintained and calibrated as required by TSs.

- Acceptable radiation protection training was provided to the licensee personnel in accordance with the radiation protection program.

- The radiation protection program was implemented by the licensee and satisfied regulatory requirements.

- Effluent monitoring satisfied the licensee and regulatory requirements.

- Releases were within the specified regulatory and TS limits.

Design Change Functions

- The inspector found that changes to the facility were evaluated using the criteria specified in 10 CFR Section 50.59, "Changes, tests and experiments," and were reviewed and approved by the Reactor Operations Committee (ROC) as required by TSs.

Committees, Audits and Reviews

- The review and the audit program was conducted by the Reactor Oversight Committee (ROC), as required by TSs.

- The ROC composition and meeting frequency satisfied the requirements specified in the TSs.

Transportation Activities

- The program for shipping radioactive material has satisfied regulatory requirements.

REPORT DETAILS

Summary of Facility Status

The Reed College (the licensee's) Class II 250 kilowatt TRIGA Mark-I research reactor is operated in support of undergraduate instruction, laboratory experiments, reactor operator training, and various types of research. During the inspection, the reactor was operated for training.

1. Procedures

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with TS Section 6.4:

- selected Reed Research Reactor (RRR) facility procedures
- procedural implementation and compliance
- recent minor and substantive procedural changes
- ROC and Radiation Safety Committee (RSC) meeting minutes for 2020 and 2021
- Standard Operating Procedure (SOP) 61, "Procedure Writing and Use," dated August 26, 2016
- SOP 62, "Changes, Tests, and Experiments," dated May 10, 2017

b. Observations and Findings

Administrative control of changes to procedures, and the associated review and approval process, were stipulated by RRR SOP 61. Substantive changes to procedures were required to be reviewed and approved by the ROC. The inspector verified that this process was being followed and that training of personnel on procedures and changes was acceptable.

c. Conclusion

The inspector determined that facility procedures were acceptably reviewed, approved, and implemented in accordance with the SOP.

2. Health Physics

a. Inspection Scope (IP 69001)

The inspector verified compliance with 10 CFR Parts 19 and 20, and TS Sections 3.5 and 4.5 and reviewed the following:

- radiological signs and posting
- contamination reports and personnel contamination forms
- personnel dosimetry records for 2021 and 2022 to date
- daily reactor startup and shutdown checklists for 2021 and 2022 to date
- external audits of the radiation safety program conducted for the ROC and RSC for the academic years 2020-2021

- selected routine surveys and monitoring records for 2021 and 2022 to date including biweekly, bimonthly, and semiannual checklists
- records of maintenance and calibration of radiation survey and monitoring instruments
- the as low as reasonably achievable (ALARA) program, as described in the Radioactive Materials Policy and Procedures Manual
- various RRR SOPs dealing with radiation monitors, health physics, and radiation work permits
- "Reed College Radioactive Materials Policy and Procedures Manual," dated June 2016
- RRR annual reports for the last two reporting periods
- airborne release calculation records
- environmental counting and analysis records
- various RRR SOPs dealing with environmental sampling and radioactive waste handling and disposal
- ROC minutes for 2021 through present
- selected routine surveys and monitoring records for 2021 and 2022 to date

b. Observations and Findings

The inspector toured the facility and observed maintenance activities. The inspector found practices regarding the use of dosimetry, radiation monitoring equipment, placement of radiological signs and postings, use of protective clothing, and the handling and storing of radioactive material or contaminated equipment was in accordance with regulations and the licensee's written radiation protection program. The inspector also verified that the licensee performed and documented annual self-assessments of the program as a tool for assuring that radiation exposure was maintained ALARA.

The inspector found radiation surveys conducted were within the limits specified by the facility postings. The inspector did not observe any unmarked radioactive material in the facility. The inspector found the licensee posted a copy of the current NRC Form 3 notice to radiation workers required by 10 CFR Part 19, at the entrance to the control room and the reactor bay. The inspector determined that doses to facility occupants was minimal. The inspector found that radiation monitoring devices were calibrated within the frequencies specified in the procedures.

The inspector noted, from records, that training was provided for radiation workers assigned to the facility and individuals were not issued dosimetry or given access until the training was successfully completed. The annual reports referenced above, described the gaseous, liquid, and solid waste generated at the facility, with gaseous Argon-41 produced by the irradiation of atmospheric air was the most significant isotope noted. The inspector found the licensee also reported the results of air sampling and thermoluminescent dosimeters placed at locations around the facility as environmental radiation monitors. Surface water and vegetation were analyzed by the licensee for indications of environmental impacts and the inspector verified they showed no significant difference from background levels.

c. Conclusion

The inspector determined that the radiation protection program being implemented by the licensee satisfied regulatory requirements.

3. Design Changes

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with 10 CFR 50.59, regarding design change control:

- recent changes initiated by the licensee using the RRR 10 CFR 50.59 screen forms
- minutes of the meetings held by the ROC and the RSC from 2021 to the present
- RRR annual reports for the last two reporting periods
- RRR biweekly checklists
- RRR maintenance log

b. Observations and Findings

Observations

The inspector found the licensee completed several 10 CFR 50.59 screens since the last inspection. The licensee used 10 CFR 50.59 screen forms to determine whether a full evaluation of a change was needed. The inspector noted that no evaluations were required to be completed. The inspector determined that the facility design change screens contained adequate supporting documentation and information required by procedure.

c. Conclusion

The inspector determined that changes to the facility were evaluated using the 10 CFR 50.59 criteria and were reviewed and approved by the ROC, as required by TSs.

4. Committees, Audits and Reviews

a. Inspection Scope (IP 69001)

In order to verify that the licensee had an oversight committee that conducted reviews and audits as required in TS Section 6.4, the inspector reviewed the following:

- Minutes of the meetings held by the ROC and the RSC from 2021 to the present
- Safety review and audit records for academic years 2020-2021
- RRR Annual Reports for the last two reporting periods

b. Observations and Findings

The inspector confirmed that the ROC met as required by the TS and a quorum was present. The inspector confirmed that the safety reviews and audits conducted by the committee or designated individuals were completed at the TS-required frequency and topics of these reviews were also consistent with TS requirements and provided guidance, direction, and oversight of the reactor.

c. Conclusion

The inspector concluded that the ROC provided the oversight required by the TS.

5. Transportation of Radioactive Materials

a. Inspection Scope (IP 86740)

The inspector reviewed the following records to verify compliance with 10 CFR 71.5, "Transportation of licensed materials." and procedural requirements for the transfer or shipment of licensed radioactive material:

- Records of radioactive material shipments completed from 2021 and to the present
- SOP 54, "Radioactive Materials Handling and Disposal," dated September 19, 2018
- SOP 84, "Shipping Radioactive Materials," dated March 22, 2019
- RRR annual reports for the last two reporting periods

b. Observations and Findings

The inspector found that the licensee appropriately documented shipments of radioactive material made from 2018 to 2020.

c. Conclusion

The inspector determined that the program for shipping radioactive material satisfied regulatory requirements.

6. Exit Interview

The inspection scope and results were summarized on April 27, 2022, with members of the licensee management. The inspector described the areas inspected and discussed in detail the inspection findings. No proprietary material was reviewed by the inspector during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

T. Ellis	Reactor Operations Manager
J. Newhouse	Facility Director
K. Oleson	Dean of the Faculty, Reed College
A. Sams	Radiation Safety Officer and Campus Environmental Director

INSPECTION PROCEDURES USED

IP 69001:	Class II Non-Power Reactors
IP 86740:	Inspection of Transportation Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None