



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

July 6, 2023

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 SAFETY
INSPECTION REPORT NO. 05000288/2023201

Dear Mr. Newhouse:

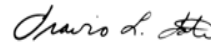
From April 17–20, 2023, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the Reed Research Reactor facility. The enclosed report documents the inspection results, which were discussed on April 20, 2023, with you and members of your staff.

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 enclosures, 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 website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). To the extent possible, your response should not include any personal privacy or proprietary information, so that it can be made available to the public without redaction.

If you have any questions concerning this inspection, please contact Juan Arellano at 301-415-0477, or by email at Juan.Arellano@nrc.gov.

Sincerely,



Signed by Tate, Travis
on 07/06/23

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: GovDelivery Subscribers

SUBJECT: REED COLLEGE – U.S. NUCLEAR REGULATORY COMMISSION SAFETY
INSPECTION REPORT NO. 05000288/2023201 DATED: JULY 6, 2023

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DATE	7/6/2023	7/6/2023	7/6/2023

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

Docket No.: 50-288

License No.: R-112

Report No.: 05000288/2023201

Licensee: Reed College

Facility: Reed Research Reactor

Location: Portland, Oregon

Dates: April 17 - 20, 2023

Inspectors: Juan Arellano

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
Inspection Report No. 05000288/2023201

The focus of this routine, announced inspection was the onsite review of selected aspects of the Reed College (the licensee) research reactor facility safety program, including: (1) organization and staffing; (2) operations logs and records; (3) requalification training; (4) surveillance and limiting conditions for operation (LCOs); (5) experiments; (6) emergency planning; (7) maintenance logs and records; and (8) fuel handling logs and records. The inspector found that the licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with U.S. Nuclear Regulatory Commission (NRC) requirements.

Organization and Staffing

- The inspector determined that the licensee's organization and staffing were consistent with technical specification (TS) requirements.

Operations Logs and Records

- The inspector determined that the operations logs and records were maintained consistent with the applicable TS.

Requalification Training

- The inspector determined that the operator requalification program was conducted and completed in accordance with the NRC-approved program and regulatory requirements.

Surveillance and Limiting Conditions for Operation

- With the exception noted in section 4 below, the inspector determined that the surveillances were conducted and the LCOs were maintained in accordance with TS requirements.

Experiments

- The inspector determined that experiments were reviewed, approved, and conducted in accordance with TS, procedural, and regulatory requirements.

Emergency Planning

- The inspector determined that the emergency preparedness program was conducted in accordance with the emergency plan.

Maintenance Logs and Records

- The inspector determined that the maintenance activities were performed and documented in accordance with the TS requirements.

Fuel Handling Logs and Records

- The inspector determined that the fuel movements and inspections were conducted in accordance with the TS and the licensee's procedural requirements.

REPORT DETAILS

Summary of Facility Status

The Reed College Class II 250 kilowatt TRIGA Mark-1 research reactor was operated in support of training, facility tours, experiments, and maintenance since the last routine inspection. During this inspection, the reactor was operated for training and facility tours.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure (IP) 69001, Section 02.01)

The inspector observed the staffing of two reactor operations and reviewed the following to verify compliance with the TS requirements for organization and staffing:

- Reed Research Reactor (RRR) annual report for the period from July 1, 2020, through June 30, 2021
- RRR annual report for the period from July 1, 2021, through June 30, 2022
- reactor oversight committee (ROC) and radiation safety committee (RSC) meeting minutes dated May 12, 2021
- ROC/RSC meeting minutes dated October 11, 2021
- ROC/RSC meeting minutes dated December 20, 2021
- ROC/RSC meeting minutes dated March 14, 2022
- ROC/RSC meeting minutes dated May 26, 2022
- ROC/RSC meeting minutes dated October 4, 2022
- ROC/RSC meeting minutes dated January 5, 2023
- ROC/RSC meeting minutes dated April 3, 2023
- RRR Administrative Procedures, section 1, "Personnel," and section 3, "Reactor Operations," dated 2020

b. Observations and Findings

The inspector found that since the previous inspection there were no facility personnel changes in the organization at the RRR. The inspector also determined that staffing was maintained as required by TS 6.1.3, "Staffing," for times that the reactor was not secured and when events required the presence of a senior reactor operator.

c. Conclusion

The inspector determined that TS requirements for organization and staffing were met.

2. Operations Logs and Records

a. Inspection Scope (Inspection Procedure (IP) 69001, Section 02.02)

The inspector observed a reactor startup and reviewed the following to ensure that logs and records were maintained as required by the licensee's administrative procedures and TS:

- reactor logbook dated February 2021 - September 2021
- reactor logbook dated September 2021 - February 2022

- reactor logbook dated February 2022 - August 2022
- reactor logbook dated August 2022 - February 2023
- RRR annual report for the period from July 1, 2020, through June 30, 2021
- RRR annual report for the period from July 1, 2021, through June 30, 2022
- standard operating procedure (SOP) 60, "Logbook Entries," dated April 22, 2022
- SOP 66, "Corrective Action Report," dated December 5, 2018.
- SOP 66B, "Corrective Action Report Log"
- SOP 66A, "Corrective Action Reports," CAR # 23-02
- SOP 66A, "Corrective Action Reports," CAR # 23-04
- SOP 2A, "Scram Response Form," performed from 2021 - present
- SOP 1, "Reactor Operation," dated December 15, 2020
- select SOP 20A, "Startup Checklist," performed from 2021 - present
- select SOP 22A, "Shutdown Checklist," performed from 2021 - present

b. Observations and Findings

The inspector found that the licensee's operation logs and records were maintained as required by the licensee's TS and administrative procedures. The inspector observed that the measured parameters for several reactor operations met the TS requirements.

c. Conclusion

The inspector determined that operations logs and records were maintained consistent with applicable TS and the licensee's procedural requirements.

3. Requalification Training

a. Inspection Scope (Inspection Procedure (IP) 69001, Section 02.04)

The inspector reviewed the following aspects of the licensee's requalification program to verify compliance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 55, "Operators' Licenses," and the licensee's NRC-approved operator requalification program:

- RRR requalification plan, dated November 18, 2020
- "Iris" requalification records for select personnel from 2021 - present
- requalification lecture attendance records from 2021 - present
- select personnel SOP, "NRC Forms 396 and 398 Review," from 2021 - present
- select personnel medical examination records from 2021 - present
- select psychological screening forms from 2021 - present
- select personnel operating exams performed from 2021 - present
- select personnel SOP 63B, "Accelerated Requalification Form," from 2022 - present
- select written examinations for personnel 2021 - present
- select operations examinations for personnel 2021 - present

b. Observations and Findings

The inspector found that the licensee's training was conducted and documented in accordance with their NRC-approved requalification and training program, and that the licensed operators' requalification records were maintained.

c. Conclusion

The inspector determined that the operator requalification program was conducted and completed in accordance with the NRC-approved program and regulatory requirements.

4. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (Inspection Procedure (IP) 69001, Section 02.05)

The inspector reviewed the following to verify compliance with TS 3.0 and to determine if surveillance tests were performed as required by TS 4.0:

- select SOP 20A, "Startup Checklist," performed from 2021 - present
- SOP 33, "Nuclear Instruments," dated December 17, 2020
- SOP 33B, "Nuclear Instruments Calibration Form," performed February 2, 2022
- SOP 33B, "Nuclear Instruments Calibration Form," performed February 5, 2023
- SOP 34, "Control Rods," dated December 17, 2020
- SOP 34B, "Control Rod Inspection Checklist," performed January 19, 2022
- SOP 34B, "Control Rod Inspection Checklist," performed February 3, 2023
- SOP 30, "Primary Cooling System and Reactor Pool," dated December 17, 2020
- SOP 30D, "Pool Temp and Level Monitor Calibration," performed January 30, 2022
- SOP 30D, "Pool Temp and Level Monitor Calibration," performed January 13, 2023
- select SOP 23A, "Biweekly Checklist," performed from 2021 - present
- SOP 23, "Biweekly Checklist," dated April 22, 2022
- select SOP 24A, "Bimonthly Checklist Form," performed from 2021 - present
- SOP 26, "Annual Checklist," dated January 8, 2023
- SOP 26A, "Annual Checklist," performed January 2022
- SOP 26A, "Annual Checklist," performed January 2023
- SOP 26B, "Console Checkout Form," performed January 30, 2022
- SOP 26B, "Console Checkout Form," performed February 10, 2023

b. Observations and Findings

On January 11, 2023, the licensee notified the NRC that during irradiated fuel movement at RRR, the ventilation system exhaust fan required to be operational stopped functioning. A RRR staff member in the area saw the fan spark, smelled a slight acrid odor, and the fan shut down. The fuel element moved at the time of the event was promptly returned to its original position and the reactor was secured.

The purpose of the ventilation system exhaust fan is to ensure that exposures to the public resulting from gaseous effluents released during normal operations and accident conditions are within regulatory limits. In normal mode, the exhaust fan draws air from the reactor room and either recirculates or discharges the air through the exhaust stack. In isolation mode, the exhaust fan draws reactor room air through the HEPA [high efficiency particulate air]

filter. With the ventilation system operable, the annual average ground concentration of Argon-41 in unrestricted areas is well below the applicable effluent concentration limits and the analysis of the maximum hypothetical accident shows that the release of effluent to the site boundary is below the 10 CFR Part 20, "Standards for Protection against Radiation," limits.

TS 3.4 states, "the reactor shall not be operated nor irradiated fuel moved unless the facility ventilation system is operable...."

Contrary to above, irradiated fuel was moved for inspection and the ventilation system became inoperable.

During this inspection, the inspector reviewed the licensee's corrective actions. The licensee identified the insulation on wires powering the exhaust fan motor wore away and exposed wiring shorted out the exhaust fan motor. The licensee replaced the damaged wiring, replaced the exhaust fan motor, and a contractor finished work on the ventilation system to return it operable on January 31, 2023. The inspector verified no reactor operations or irradiated fuel movement occurred while the ventilation system was inoperable.

The licensee was informed that failure of TS 3.4 was a Severity Level IV violation. As indicated above, the inspector determined that the problem, was identified by the licensee and reported to the NRC. Corrective actions were identified and completed as well. As a result, this non-willful, non-repetitive, licensee-identified and licensee-corrected violation will be treated as a non-cited violation (NCV), consistent with section 2.3.2.a of the NRC Enforcement Policy (NCV 05000288/2023201-01). This issue is closed.

With the exception noted above, the inspector found that the surveillance tests were completed as required by the TS and the LCO verifications were completed on schedule and in accordance with the licensee's procedures.

c. Conclusion

With the exception noted above, the inspector determined that surveillances were conducted and LCOs were maintained in accordance with the TS requirements.

5. Experiments

a. Inspection Scope (Inspection Procedure (IP) 69001, Section 02.06)

The inspector reviewed the following to ensure that experiments were reviewed and conducted as required by TS 3.6 and 6.5:

- RRR Administrative Procedures, section 4, " Reactor Experiments," dated 2020
- SOP 10, "Irradiation Preparation," dated April 22, 2022
- SOP 12, "Lazy Susan," dated April 22, 2022
- SOP 13, "Rabbit," dated April 22, 2022
- RRR "Routine Experiment 1 Irradiation with Neutrons," dated April 15, 2011
- select SOP 10A, "Irradiation Request Form," performed 2021 - present

b. Observations and Findings

The inspector found that no new experiments were reviewed and approved since the last inspection as required by TS 6.5 and 10 CFR 50.59, "Changes, tests and experiments." The inspector also found that experiments were conducted in accordance with the licensee's procedures and TS 3.6.

c. Conclusion

The inspector determined that experiments conducted in accordance with TS and regulatory requirements.

6. Emergency Planning

a. Inspection Scope (IP 69001, Section 02.10)

The inspector reviewed the following selected portions of the licensee's emergency preparedness program to verify compliance with NRC regulatory requirements, and the licensee's emergency plan (EP):

- RRR E-Plan dated January 2016
- RRR emergency notification call list
- SOP 25, "Semiannual Checklist," dated January 8, 2023
- select SOP 25A, "Semiannual Checklist," performed from 2021 - present
- "Iris" requalification records for select personnel from 2021 - present
- emergency drills held in 2021, 2022, 2023
- emergency drill feedback forms for drills held in 2022 and 2023
- SOP 65D, "Tour Group," for Portland Fire Bureau training performed March 2023
- community safety officer's reactor training forms performed March 2023
- Portland Police Bureau training video

b. Observations and Findings

The inspector found that EP training was conducted, drills were performed, emergency response call lists were maintained and posted, and emergency equipment was maintained and available as required by the EP and licensee procedures. Inspection follow-up item (IFI) 05000288/2021201-02 was opened during a previous inspection due to a video of the RRR facility taken by the Portland Police Bureau not available for review at the time. The inspector watched the video and verified it could be utilized for training as required by the EP. This item is closed with no further action required.

c. Conclusion

The inspector determined the emergency preparedness program was conducted in accordance with the EP.

7. Maintenance Logs and Records

a. Inspection Scope (Inspection Procedure (IP) 69001, Section 02.08)

The inspector reviewed the following maintenance logs and records to verify compliance with the requirements of TS:

- RRR annual report for the period from July 1, 2020, through June 30, 2021
- RRR annual report for the period from July 1, 2021, through June 30, 2022
- SOP 60, "Logbook Entries," dated April 22, 2022
- select SOP 60A, "Maintenance Log," performed from 2021 - present
- SOP 60B, "Maintenance Log"
- SOP 66B, "Corrective Action Report Log"
- SOP 62A, "10 CFR 50.59 Screen Form," 23-02, performed January 31, 2023

b. Observations and Findings

The inspector found that schedules and unscheduled preventative and corrective maintenance activities were performed and documented in accordance with TS requirements and the licensee's administrative procedures.

c. Conclusion

The inspector determined the maintenance activities were performed and documented in accordance with the TS requirements.

8. Fuel Handling Logs and Records

a. Inspection Scope (Inspection Procedure (IP) 69001, Section 02.08)

The inspector reviewed the following fuel handling logs and activities to verify compliance with TS requirements:

- SOP 35, "Fuel and Core," dated April 22, 2022
- SOP 35A, "Core Diagram," dated January 11, 2011
- SOP 35B, "Fuel Handling Checklist," performed 2022 - present
- SOP 35D, "Fuel Element Inspection Form," performed 2022 - present
- reactor logbook dated September 2021 - February 2022
- reactor logbook dated August 2022 - February 2023

b. Observations and Findings

The inspector found that the fuel handling activities were conducted and documented in accordance with the TS requirements and the licensee's procedural requirements.

c. Conclusion

The inspector determined that the fuel inspections and movements were conducted in accordance with the TS and licensee's procedural requirements.

9. Exit Interview

The inspection scope and results were summarized on April 20, 2023, with members of licensee management. The inspector described the areas inspected and discussed the inspection results.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

T. Ellis	Reactor Operations Manager
J. Newhouse	Director

INSPECTION PROCEDURE USED

IP 69001	Class II Non-Power Reactors
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ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000288/2023201-01	NCV	Violation of TS 3.4, "Ventilation System"
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Closed

05000288/2023201-01	NCV	Violation of TS 3.4, "Ventilation System"
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05000288/2021201-02	IFI	Police training video verification
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