

November 12, 2004

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

SUBJECT: NRC INSPECTION REPORT NO. 50-288/2004-201

Dear Mr. Frantz:

This letter refers to the inspection conducted on November 1-4, 2004, at your TRIGA Mark-I Research Reactor Facility. The inspection included a review of activities authorized for your 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 noncompliances of NRC requirements were identified. No response to this letter is required.

In accordance with 10 CFR 2.390 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/reading-rm/adams.html>.

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

Sincerely,

/RA/

Patrick M. Madden, Section Chief
Research and Test Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

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

Enclosure: NRC Inspection Report
cc w/encl: Please see next page

Reed College

Docket No. 50-288

cc:

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

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

Reed College
ATTN: Dr. Colin Diver
President
3203 S.E. Woodstock Boulevard
Portland, OR 97202-8199

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

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

November 12, 2004

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

SUBJECT: NRC INSPECTION REPORT NO. 50-288/2002-201

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

Docket No: 50-288

License No: R-112

Report No: 50-288/2004-201

Licensee: Reed College

Facility: Reed Reactor Facility

Location: 3203 S.E. Woodstock Boulevard
Portland, Oregon

Dates: November 1-4, 2004

Inspector: Craig Bassett

Approved by: Patrick M. Madden, Section Chief
Research and Test Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Reed College
Reed Reactor Facility
Report No.: 50-288/2004-201

The primary focus of this routine, announced inspection included onsite review of selected aspects of the Reed College Class II research reactor's safety programs including: organization and staffing, review and audit and design change functions, operator re-qualification program, procedures, fuel handling, maintenance and surveillance, conduct of operations, experiments, and emergency preparedness. The licensee's programs were acceptably directed toward the protection of public health and safety and were in compliance with NRC requirements. No safety concerns or violations of regulatory requirements were identified.

Organization and Staffing

- The organization and staffing remain in compliance with the requirements specified in Technical Specification Sections I and K.

Review, Audit, and Design Change Functions

- Review and oversight functions required by Technical Specification Sections I.2 - I.4 were acceptably completed by the Reactor Operations Committee and the Radiation Safety Committee. Audits were generally being completed as required.
- 10 CFR 50.59 changes had been reviewed and approved by the Committee as required and none were determined to constitute a safety concern or question.

Operator Licenses, Re-qualification, and Medical Activities

- The operator re-qualification/training program was up-to-date and being acceptably implemented. Documentation of the program was acceptable.
- Medical examinations were being completed as required.

Procedures and Procedural Compliance

- Facility procedures and document reviews satisfied Technical Specification Section I.5 requirements. Procedural compliance was acceptable.

Fuel Handling and Movement

- Reactor fuel movements and inspections were made and documented in accordance with procedure.
- One-fifth of the fuel elements were generally being inspected on a biennial basis as allowed by Technical Specification Section E.3. However, one licensee-identified Non-Cited Violation was noted for failure to inspect all fuel elements every 10 years.

Maintenance and Surveillance

- Maintenance was being completed as needed.
- The program for surveillance and calibration of equipment was being implemented in accordance with Technical Specification requirements specified in Sections D-G.

Conduct of Operations

- Operations were being conducted in accordance with Technical Specification and procedural requirements. One licensee-identified Non-Cited Violation was noted for failure to complete two Shutdown Checklists during 2004 as required by procedure.

Experiments

- The program for the control of experiments satisfied Technical Specification Section J and regulatory requirements.

Emergency Preparedness

- The Emergency Plan and Emergency Implementation Procedures were being audited and reviewed annually as required.
- Letters of Agreements documenting emergency support to be provided by offsite agencies were being maintained and updated as required.
- Annual drills were being held and documentation was maintained concerning the follow-up critiques subsequent corrective actions taken as needed.
- Emergency preparedness training for staff and offsite personnel was generally being conducted as stipulated in the Emergency Plan.

REPORT DETAILS

Summary of Plant Status

The licensee's 250 kilowatt TRIGA Mark-I research and test reactor (RTR) continued normal, routine operations. A review of the applicable records indicated that the reactor is typically operated in support of undergraduate instruction, laboratory experiments, reactor system testing, reactor surveillances, and operator training. During this inspection, the reactor was started up and operated one day at varying power levels to provide a demonstration of operations for staff members from the Reed College Admissions Office.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure [IP] 69001)

To verify organization and staffing requirements specified in Technical Specifications (TS) Sections I and K, Amendment Number (No.) 7, dated March 11, 2003, were being met, the inspector reviewed:

- organization and staffing for the Reed Reactor Facility (RRF)
- administrative controls and management responsibilities specified in the TS
- Main Log (reactor console log) Numbers (Nos.) 58 through 64
- Maintenance Logbooks Nos. V and VI
- RRF Administrative Procedures, Section II, "Personnel and Programmatic Responsibilities," latest revision dated November 2002
- RRF Administrative Procedures, Section III, "Reactor Operations," latest revision dated November 2002
- RRF Standard Operating Procedure (SOP) 10, "Writing in Log Books," latest revision dated October 2000
- Reed Reactor Facility Annual Report for September 1, 2002 - August 31, 2003

b. Observations and Findings

Through discussions with licensee representatives the inspector determined that management responsibilities and the organization at the Reed Reactor Facility (RRF) had not changed since the previous NRC inspection in December 2003 (Inspection Report No. 50-288/2003-201). The inspector determined that the Facility Director retained direct control and overall responsibility for management of the facility as specified in the TS. The Facility Director reported to the President of Reed College through the Dean of the Faculty.

The licensee's current operational organization consisted of the Facility Director, an Associate Director, a Reactor Supervisor, and a Contract Health Physicist. Of these individuals, the Facility Director, the Associate Director, and the Reactor Supervisor were Senior Reactor Operators (SROs). In addition, there were 10 other SROs and 23 Reactor Operators (ROs) qualified to operate the facility RTR. (The positions of Facility Director and Associate Director are full-time positions while all the others are part-time.) This organization was consistent with that specified in the TS.

c. Conclusions

Organization and staffing met the requirements specified in TS Section I and K.

2. Review, Audit, and Design Change Functions

a. Inspection Scope (IP 69001)

In order to verify that the licensee had established and conducted reviews and audits as required and to determine whether modifications to the facility were consistent with 10 CFR 50.59 and TS Sections I.2 - I.4, the inspector reviewed:

- Reactor Operations Committee meeting minutes from April 2003 through the present
- Radiation Safety Committee meeting minutes from April 2003 through the present
- Reactor Review Committee meeting minutes from April 2003 through the present
- completed audits and reviews for 2002 through 2003
- design changes reviewed under 10 CFR 50.59 for 2003 and 2004
- RRF Facility Administrative Procedures, Section II, "Personnel and Programmatic Responsibilities," latest revision dated November 2002

b. Observations and Findings

(1) Review and Audit Functions

The inspector reviewed the Reactor Operations Committee (ROC), the Radiation Safety Committee (RSC), and the Reactor Review Committee (RRC) meeting minutes from April 2003 to the present. These meeting minutes showed that the ROC, the RSC, and the RRC had met at the required frequency and had considered the types of topics outlined by the TS.

The inspector noted that, since the last NRC inspection, most audits had been completed by the ROC and the RSC in those areas outlined in the TS. The audits were designed so that all major aspects of the licensee's operations and safety programs were reviewed every year. Standard Operating Procedures were reviewed every two years while other major facility documents, such as the facility license and Technical Specifications, were reviewed every four years. The inspector noted that the audits and the resulting findings were detailed and that the licensee responded and took corrective actions as needed.

When questioned about the audits that had not been completed, the licensee indicated that they were considering various options to ensure that all audits were completed in a timely manner and as required. These options included making the subject of "Audits" a permanent item and placing it first on the RRC meeting agenda; assigning shorter completion dates so that audits could be re-assigned if needed; and, having the facility audit program reviewed/audited by a member of the RRC. The licensee was informed that the issue of completing all required audits in a timely manner was identified as an area for improvement and will be followed by

the NRC as an Inspector Follow-up Item (IFI). This issue will be reviewed during a subsequent inspection (IFI 50-288/2004-201-01).

(2) Design Changes

Through review of applicable records and interviews with licensee personnel, the inspector determined that each design or equipment change (10 CFR 50.59 Review) that had been initiated and/or completed at the RRF since the last NRC operations inspection had undergone a review by the ROC as required. Following the review, the changes were approved in accordance with the TS requirements. It was noted that none of the changes was determined to constitute a safety question or concern and none required a license amendment.

c. Conclusions

Review and oversight functions required by TS Sections I.2 - I.4 were acceptably completed by the ROC. Audits were generally being completed as required. 10 CFR 50.59 changes had been reviewed and approved by the ROC as required and none were determined to constitute a safety concern.

3. Operator Licenses, Re-qualification, and Medical Activities

a. Inspection Scope (IP 69001)

To determine that operator re-qualification activities and training were conducted as required and that medical requirements were met, the inspector reviewed:

- Reed Reactor Facility Re-qualification Plan dated October 2000
- active license status of all current operators
- logs and records of reactivity manipulations for the 2003 through the present for selected operators
- written examinations given during 2003 and 2004 for selected operators
- training lectures and records for the current training cycle
- medical examination records for selected operators
- Procedure Change Notice forms maintained for review by all licensed operators and dated from December 2002 to the present

b. Observations and Findings

As noted above, there are currently 13 qualified SROs and 23 qualified ROs at the RRF. The inspector reviewed all of the operators' licenses and noted that they were all current.

A review of the logs and records showed that training had been conducted in accordance with the licensee's re-qualification and training program. Training reviews and examinations had been documented as required. Records of quarterly reactor operations, reactivity manipulations, other operations-related activities, and Reactor Supervisor activities were being maintained. Records indicating the completion of the annual operations tests and supervisory observations were also maintained. Biennial

written examinations were being completed as required or credit was taken by the licensee for the SRO exams administered by the NRC to satisfy the re-qualification cycle exam requirements when applicable. The inspector noted that operators were receiving the required biennial medical examinations as well.

c. Conclusions

The re-qualification/training program was up-to-date and being acceptably maintained. Medical examinations were being completed as required.

4. Procedures and Procedural Compliance

a. Inspection Scope (IP 69001)

To determine whether facility procedures met the requirements outlined in TS Section I.5, the inspector reviewed:

- RRF Administrative Procedures, Section VII, "Adoption of Operating Procedures," latest revision dated November 2002
- RRF SOP 01, "Startup Checklist," latest revision dated August 2004
- RRF SOP 03, "Reactor Operations," latest revision dated August 2004
- RRF SOP 04, "Same Day Startup," latest revision dated January 2003
- RRF SOP 05, "Shutdown," latest revision dated August 2004
- procedural reviews and updates documented in the RRC meeting minutes

b. Observations and Findings

RRF SOPs were found to be acceptable for the current facility status and staffing level. The SOPs specified the responsibilities of the various members of the staff. The procedures were being audited and reviewed biennially and updated as needed. It was also noted that revisions to procedures were routinely presented to the RRC for review and approval. The inspector verified that the latest revisions to various SOPs had been through this review and approval process as required.

The inspector observed various activities during this inspection including a reactor start up, steady state operation, and shut down. It was noted that the operations were completed in accordance with the applicable procedures.

On July 12, 2004, the licensee submitted a letter to the NRC explaining that it discovered that the RRF SOPs were not exactly consistent with the wording in 10 CFR 10.54(m)(1). The regulation requires that an SRO be present at the reactor during the first approach to critical each day, during a recovery from an unplanned shutdown, and readily available as needed. The licensee indicated that the SOPs required an SRO to be present to approve paperwork for the first approach to power each day and for a recovery from an unplanned shutdown. However, the SOPs did not specifically require an SRO to remain in the facility while the reactor was going to power. The licensee indicated that they had revised the procedures to require an SRO to be present in the facility during the first approach to power each day and during a recovery from an unplanned shutdown. The inspector reviewed SOP 1, "Startup

Checklist,” and SOP 3, “Reactor Operations,” and verified in Section 1.3 and Section 3.3 respectively, each entitled, “Personnel Requirements,” that an SRO was required to be present in the facility during initial start-up and approach to power and present in the facility or readily available on call at all times during reactor operations.

c. Conclusions

Facility procedures and document reviews satisfied TS Section I.5 requirements. Procedural compliance was acceptable.

5. Fuel Handling and Movement

a. Inspection Scope (IP 69001)

In order to verify adherence to fuel handling and inspection requirements specified in TS Section E, the inspector reviewed:

- RRF SOP 40, “Fuel Element Inspection,” latest revision dated August 2004
- RRF SOP 40: Appendix A, “Fuel Handling Checklist,” latest revision dated July 2003
- RRF SOP 41, “Control Rod Inspection,” latest revision dated August 2004
- Main Log Nos. 58 through 64
- Maintenance Logbooks Nos. V and VI
- Fuel Element Information Cards
- Fuel Element information contained in the licensee’s computer database

b. Observations and Findings

The inspector determined that the licensee was maintaining the required records of fuel movements as they were completed. The inspector also verified that the movements were conducted in compliance with procedure. The reactor fuel was being inspected upon initial receipt and one-fifth of the fuel elements in the core were being inspected biennially as allowed by TS Section E.3.

The inspector noted that the procedure used for fuel inspection had been revised recently. The previous procedure required five people plus an RO for fuel movements. This was attributed to the difficulty of using the fuel handling tool. The licensee had since acquired a new fuel handling tool and the procedure was revised because fewer people were required for this process. The procedure was acceptable and the radiological control requirements specified for these operations were adequate.

By letter dated August 5, 2003, the licensee notified the NRC of an apparent violation of RRF TS Section E.3. In the summer of 2003, the licensee experienced a fuel leak event and, during the investigation of that problem which involved switching fuel from one position to another, one of two spare fuel elements was placed in the core. (The licensee maintains four “extra” elements in storage racks outside the core. Two of the extra elements are damaged and two are useable spares.) During the leak investigation and the fuel switching process, the licensee determined that the spare fuel element had not been inspected prior to being placed in the core. Following resolution

of the fuel leak problem, the licensee initiated an inspection of the extra or spare fuel elements. This was completed on August 7, 2003. The licensee also revised their fuel inspection procedure to require that all fuel, to include spare elements, be inspected every ten years as required by TS Section E.3. The inspector reviewed the fuel element cards and inspection records and verified that the fuel had been inspected. The inspector also reviewed SOP 40, "Fuel Element Inspection," and verified that it had been revised to ensure that all fuel elements were required to be inspected. The licensee was informed that this licensee-identified and corrected violation (involving failure to inspect all fuel elements every ten years) was being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-288/2004-201-02).

c. Conclusions

Reactor fuel movements and inspections were completed and documented in accordance with procedure and the fuel was generally being inspected as specified by TS Section E.3. One licensee-identified NCV was noted for failure to inspect all fuel elements every ten years as required by the TS.

6. Maintenance and Surveillance

a. Inspection Scope (IP 69001)

To verify that operations were conducted in accordance with TS Sections I and K, and to determine that surveillance activities and calibrations were being completed as required by TS Sections D - G, the inspector reviewed:

- Main Log (reactor console log) Nos. 58 through 64
- Maintenance Logbooks Nos. V and VI
- associated surveillance and calibration data and records for 2003-2004
- Reed Reactor Facility Annual Report for September 1, 2002 - August 31, 2003
- RRF Administrative Procedures, Section III, "Reactor Operations," latest revision dated November 2002
- RRF SOP 10, "Writing in Log Books," latest revision dated August 2004
- RRF SOP 41, "Control Rod Inspection," latest revision dated November 2002
- RRF SOP 41: Appendix A, "Control Rod Inspection Checklist," latest revision dated June 2001
- RRF SOP 42, "Control Rod Drop Times," latest revision dated July 2003
- RRF SOP 43, "Control Rod Calibration," latest revision dated August 2004
- RRF SOP 44, "Power Calibration," latest revision dated July 2003
- RRF SOP 70, "Weekly Checklist," latest revision dated August 2004
- RRF SOP 70: Appendix A, "Weekly Checklist," latest revision dated August 2004
- RRF SOP 71, "Bimonthly Checklist," latest revision dated July 2004
- RRF SOP 71: Appendix A, "Bimonthly Checklist," latest revision dated July 2004
- RRF SOP 72, "Semiannual Checklist," latest revision dated July 2004
- RRF SOP 72: Appendix A, "Semiannual Checklist," latest revision dated June 2001
- RRF SOP 73, "Annual Checklist," latest revision dated July 2004
- RRF SOP 73: Appendix A, "Annual Checklist," latest revision dated January 2003
- RRF SOP 80, "Ion Exchange Tank Maintenance," latest revision dated August 1998

- RRF SOP 82, "Lazy Susan Maintenance," latest revision dated August 1998

b. Observations and Findings

The Facility Director maintained a schedule for reactor operations and tracked the completion of maintenance and surveillance activities. This practice kept the staff aware of upcoming activities and helped ensure good administrative control over operational aspects of the facility.

A review of the RRF Main Logs and Maintenance Logbooks showed that they were being completed as required and problems, if any, were being documented. This review also confirmed that maintenance was being conducted as needed consistent with the TS and applicable procedures. The inspector also noted that the structures, systems, or components that were affected by maintenance activities were verified to be operable before being placed back into operation.

The inspector determined that selected weekly, bimonthly, semiannual, and annual checks, tests, and/or calibrations for TS-required surveillances and calibrations were completed as stipulated. The surveillances and calibrations reviewed were generally completed on schedule and in accordance with licensee procedures. All the recorded results reviewed were within the TS and procedurally prescribed parameters. The records and logs reviewed were accurate, complete, and being maintained as required.

In January 2004, the licensee notified the NRC, for information purposes only, of a problem that had occurred at the facility. During routine operation, one of the operators noticed that the Shim rod was not working correctly. The rod would not move when the button on the console was depressed. Normal/routine adjustment of the limit switches and balancing the potentiometer did not correct the problem. The licensee began trouble shooting the problem and switched the control from Shim 2 to Shim 1 in the console by moving plugs J9 to J8. In that configuration, the shim rod appeared to function properly. Upon completion of the investigation, the control was left in the Shim 1 position. (The licensee assumed that both shim drive modules were identical and that they were replacing like-for-like.) When a Startup Checklist was initiated, the licensee found that the two shim drive modules were different and caused different rod reactions. In the "old" or previous configuration, the Shim rod would not move when another rod UP button was depressed. In the new configuration, the Shim rod could move when another rod UP button was pressed, although no two rods could be withdrawn at the same time. Because the shim drive modules were not the same, the licensee initiated a 50.59 Review of the situation. The licensee determined that inhibiting both rods rather than just one was an artifact of the circuitry and was not actually required. The licensee verified that the "new" configuration was appropriate according to the original design and in accordance with the TS. (The licensee also verified that the Shim rod in the TRIGA reactor at Oregon State University functioned in this manner.) The 50.59 Review was presented to the Reactor Operations Committee via E-mail and approved. The inspector reviewed the problem and the related maintenance records and 50.59 Review. It appeared that the licensee proceeded in a logical manner to correct the problem. Post maintenance testing indicated a circuitry difference in the two drive modules. Once this was discovered, a 50.59 Review was initiated and the Reactor Operations Committee reviewed and approved the new

configuration. At no time was the licensee without the required interlock. There were no violations of the TS or regulations.

c. Conclusions

Maintenance was being completed as required. The program for surveillance and calibration of equipment was being carried out in accordance with TS requirements.

7. Conduct of Operations

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to verify operation of the reactor in accordance with TS Sections A-I:

- Main Log (reactor console log) Nos. 58 through 64
- Maintenance Logbooks Nos. V and VI
- RRF Administrative Procedures, Section III, "Reactor Operations," latest revision dated November 2002
- RRF SOP 1, "Startup Checklists," latest revision dated August 2004
- RRF SOP 1: Appendix A, "RRF Startup Checklist," latest revision dated August 2004
- RRF SOP 3, "Reactor Operations," latest revision dated August 2004
- RRF SOP 4, "Same-Day Startup," latest revision dated January 2003
- RRF SOP 4: Appendix A, "RRF Same-Day Startup Checklist," latest revision dated August 2004
- RRF SOP 5, "Shutdown Checklist," latest revision dated August 2004
- RRF SOP 5: Appendix A, "RRF Shutdown Checklist," latest revision dated July 2003
- RRF SOP 10, "Writing in Log Books," latest revision dated August 2004
- RRF SOP 70, "Weekly Checklist," latest revision dated August 2004
- RRF SOP 70: Appendix A, "Weekly Checklist," latest revision dated August 2004
- RRF SOP 71, "Bimonthly Checklist," latest revision dated July 2004
- RRF SOP 71: Appendix A, "Bimonthly Checklist," latest revision dated July 2004
- RRF SOP 72, "Semiannual Checklist," latest revision dated July 2004
- RRF SOP 72: Appendix A, "Semiannual Checklist," latest revision dated June 2001
- RRF SOP 73, "Annual Checklist," latest revision dated July 2004
- RRF SOP 73: Appendix A, "Annual Checklist," latest revision dated January 2003
- Reed Reactor Facility Annual Report for September 1, 2002 - August 31, 2003

b. Observations and Findings

The inspector reviewed selected operations reactor operating records from January 2003 through the present. These records included daily Startup Checklists, Shutdown Checklists, Experimental Startup and Shutdown Checklists, associated forms, Weekly Checklists, and the Main (reactor console) Logs. Additionally, the inspector observed a reactor startup, a shutdown, and steady state operations during the inspection. Reactor operations were carried out in accordance with written procedures as required by TS Section I.

Information on the operational status of the facility was recorded accurately on the log sheets and/or checklists as required by procedure. Scrams were identified in the logs and recorded on the appropriate forms, and were reported and resolved as required before the resumption of operations. Through interviews with operators and review of logs and records, the inspector confirmed that shift staffing met the minimum requirements for duty and on-call personnel as required by SOP 1 and SOP 3.

The inspector also observed a Supervisors' Meeting which was attended by the Facility Director, the Associate Director, the Reactor Supervisor, and the Training Supervisor. Issues discussed included facility schedules, operations, training, security, and personnel. The meeting provided everyone with an opportunity to coordinate activities and schedules and ensure that operations would be conducted as required.

By letter dated July 12, 2004, the licensee notified the NRC of an apparent violation of RRF TS Section I.5. Following operation of the reactor, the licensee is required by SOP 5 to complete a Shutdown Checklist and verify certain actions have been taken prior to midnight on the day of reactor operations. On Friday, March 12, 2004, a Shutdown Checklist was not completed due to a scheduling oversight. On the following Monday this problem was noted and a Shutdown Checklist was completed. On May 8, 2004, operators who were scheduled to complete the Shutdown Checklist failed to attend training that evening and no checklist was finalized prior to midnight. Personnel present at the facility realized the oversight and a Shutdown Checklist was completed but, by then, it was after midnight. The licensee has taken various actions to correct this problem. Originally, reactor operations and the shutdown activities were scheduled at the same time. The licensee now schedules these as separate events and operators sign up to complete these separately. Also, personnel completing the Shutdown Checklist are required to E-mail the Facility Director when actions have been completed so that there is a separate check for the activity. Close supervision of the activity and reiterating the instructions for all personnel was also being conducted. The licensee was informed that this licensee-identified and corrected violation (involving failure to follow procedure by not completing the appropriate Shutdown Checklists as required) was being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-288/2004-201-03).

c. Conclusions

Based on the procedures and records reviewed and observations made during the inspection, the inspector determined that reactor operations and logs were acceptable and in accordance with procedural and TS requirements. An NCV was noted for failure to follow procedure by not completing the required Shutdown Checklist following reactor operations.

8. Experiments

a. Inspection Scope (IP 69001)

In order to verify that experiments were being conducted within approved guidelines specified in TS Section J, the inspector reviewed:

- selected Routine, Modified Routine, and Special Experiments
- experiment review and approval by the ROC
- selected Irradiation Request Forms for 2003 and 2004
- RRF Administrative Procedures, Section IV, "Reactor Experiments," latest revision dated November 2002
- RRF SOP 50, "Irradiation Request Forms," latest revision dated October 2003
- RRF SOP 50: Appendix A, "Irradiation Request Form," latest revision dated October 2003
- RRF SOP 50: Appendix B, "RRF Rabbit Irradiation Form," latest revision dated October 2003
- RRF SOP 50: Appendix C, "Sample Activity Estimation," latest revision dated August 1998
- RRF SOP 50: Appendix D, "Sample Preparation," latest revision dated November 2000
- RRF SOP 50: Appendix E, "Sample Transfer," latest revision dated October 2003
- RRF SOP 50: Appendix F, "Neutron Activation Analysis," latest revision dated February 2004
- RRF SOP 50: Appendix G, "Qualification Checklist for Performing Neutron Activation Analysis," latest revision dated December 2002
- RRF SOP 51, "Rabbit Irradiations," latest revision dated July 2003
- RRF SOP 51: Appendix A, "Qualification Checklist for Performing Rabbit Irradiations," latest revision dated December 2002
- RRF SOP 52, "Lazy Susan Irradiations," latest revision dated November 2000
- RRF SOP 53, "Central Thimble Irradiations," latest revision dated December 2000
- RRF SOP 55, "Beam Irradiations," latest revision dated June 2001
- RRF SOP 55: Appendix A, "Beam Irradiations Checklist," latest revision dated June 2001

b. Observations and Findings

The inspector noted that all the experiments conducted at the facility were well-established procedures that had been in place for several years. There were 15 Routine and/or Modified Routine experiments and 22 Special experiments that have been reviewed and approved by the ROC. The last routine experiment to be revised and approved was Experiment No. 3, "Routine Irradiation Utilizing an Evacuated Central Thimble," dated February 26, 2001. The last special experiment to be revised and/or approved was Special Experiment No. 24, "Mica Wafers as a Directional Fast Neutron Detector," dated February 3, 1995.

The inspector noted that irradiations were conducted under the cognizance of the Facility Director and the Reactor Supervisor as required. The irradiations were documented in the Main Log and the results of the experiments were documented on the Irradiation Request Forms as required. The resulting radioactive material was being transferred to an authorized user or disposed of as stipulated by procedure.

c. Conclusions

The license's program for the control of experiments satisfied regulatory and TS Section J requirements.

9. Emergency Preparedness

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of:

- the Reed Reactor Facility Emergency Plan last revised January 2003
- the Reed Reactor Facility Emergency Plan, Appendix A, Agreement Letters with The City of Portland Police Bureau, The City of Portland Fire Bureau, AMR Ambulance Service, Legacy Health System, and Oregon Office of Energy
- the Reed Reactor Facility Emergency Plan, Appendix B, Emergency Implementation Procedures (EIPs), dated March 2004
- EIP Attachment A, "Response When No One Is At The Facility," dated March 2004
- EIP Attachment B, "Facility Alarms, Facility Equipment, Monitor Readings, and Typical Primary Activity," dated March 2004
- EIP Attachment C, "Contents of Emergency Grab-Bag," dated March 2004
- EIP Attachment D, "Key Phone Numbers," dated March 2004
- EIP Attachment E, "Gaseous Fission Products," dated March 2004
- EIP Attachment F, "Event Notification Worksheet," dated March 2004
- EIP Attachment G, "Reed College Reactor Press Release Sample Form," dated March 2004
- emergency response facilities, supplies, equipment and instrumentation
- training records for the past two years
- emergency drills and exercises held during 2003 and 2004

b. Observations and Findings

The Emergency Plan (E-Plan) in use at the reactor and emergency facilities was the same as the version most recently approved by the NRC. The E-Plan and Emergency Implementation Procedures were being audited and reviewed annually as required. Facilities, supplies, instrumentation, and equipment were being maintained, controlled, and inventoried as required in the E-Plan.

Through records review and interviews with licensee personnel, emergency responders were determined to be knowledgeable of the proper actions to take in case of an emergency. Agreements with outside response organizations were being maintained and had been updated as required. Communications capabilities were acceptable and had been tested and emergency information updated as stipulated in the E-Plan.

Emergency drills had been conducted annually as required by the E-Plan. Off-site support organization participation was also as required by the E-Plan. Critiques were held following the drills to discuss the strengths and weaknesses identified during the exercise and to develop possible solutions to any problems identified. The results of these critiques were documented and reported to the RSC. Emergency preparedness and response training for off-site and reactor staff personnel was being conducted annually and documented as stipulated by the E-Plan.

The inspector also visited the City of Portland Fire Bureau, Station No. 20, which was the facility that would respond to the RRF if needed. The fire station was noted to be

well equipped to handle fire emergencies, the personnel were knowledgeable of the correct actions to take at the facility, and there was a good working relationship between the Fire Bureau staff and the licensee staff.

c. Conclusions

The emergency preparedness program was conducted in accordance with the Emergency Plan.

10. Follow-up on Previous Open Items

a. Inspection Scope

The inspector reviewed the licensee's actions taken in response to a previously identified Inspector Follow-up Item (IFI).

b. Observation and Findings

(Closed) IFI 50-288/2002-202-01 - During a previous inspection it was noted that the completion of training and quarterly reactor operations and manipulations were not always documented as required by the Re-qualification Program.

During this inspection, the inspector reviewed the status of this issue. It was determined that the licensee had developed a form for tracking training and a form for documenting the number of operating hours completed by each operator each quarter and the number of manipulations that each operator completed as well. These improvements in the Re-qualification Program demonstrated that the licensee had made progress in this important area and had resolved the documentation problem. This IFI is considered closed.

10. Exit Interview

The inspection scope and results were summarized on November 4, 2004, with licensee representatives. The inspector discussed the findings for each area reviewed. The licensee acknowledged the findings and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

C. Anderson, Senior Reactor Operator and Reactor Supervisor
R. Barnett, Associate Director, Reed Reactor Facility
S. Frantz, Facility Director
J. Griffith, Senior Reactor Operator and Training Supervisor

Other Personnel

K. Fisher, Radiation Safety Officer and Campus Environmental Director
B. Knotts, Captain, City of Portland Fire Bureau, Station No. 20
M. Parrott, Reactor Health Physicist (Contractor)

INSPECTION PROCEDURE USED

IP 69001 Class II Non-Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-288/2004-201-01	IFI	Follow-up on the issue of the licensee or RRC completing all required audits in a timely manner.
50-288/2004-201-02	NCV	Failure to inspect all fuel elements every ten years as required by TS Section E.3.
50-288/2004-201-03	NCV	Failure to follow procedure by not completing the appropriate Shutdown Checklists as required by TS Section I.5.

Closed

50-288/2002-201-01	IFI	Follow-up on complete and accurate documentation of activities specified in the Re-qualification plan
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LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
E-Plan	Emergency Plan
IP	Inspection Procedure
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records
RO	Reactor operator
ROC	Reactor Operations Committee
RRC	Reactor Review Committee
RRF	Reed Reactor Facility
RSC	Radiation Safety Committee
RTR	Research and Test Reactor
SOP	Standard Operating Procedure
SRO	Senior reactor operator
TS	Technical Specifications