January 6, 2015

Dr. Melinda Krahenbuhl, Director
Reed Reactor Facility
Reed College
3203 S.E. Woodstock Boulevard
Portland, OR 97202-8199

SUBJECT: REED COLLEGE – NRC ROUTINE INSPECTION REPORT NO. 50-288/2014-202

Dear Dr. Krahenbuhl:

From December 8 to 11, 2014, the U.S. Nuclear Regulatory Commission (NRC or the Commission) completed an inspection at the TRIGA Mark-I Reed Research Reactor facility (Inspection Report No. 50-288/2014-202). The enclosed report documents the inspection results, which were discussed on December 11, 2014, with you, with Dr. Nigel Nicholson, Dean of the Faculty, and Kathleen Fisher, Radiation Safety Officer and Campus Environmental Director.

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, and 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).

Should you have any questions concerning this inspection, please contact Mr. Craig Bassett at 301-466-4495 or by electronic mail at Craig.Bassett@nrc.gov.

Sincerely,

/RA/

Kevin Hsueh, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

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

Enclosure:
NRC Inspection Report No. 50-288/2014-202

cc w/enclosure:
See next page

Reed College Docket No. 50-288

cc:

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

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

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NAME	CBassett*	KHsueh
DATE	1/2/2015	1/6/2015

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

Docket No:	50-288
License No:	R-112
Report No:	50-288/2014-202
Licensee:	Reed College
Facility:	Reed Research Reactor
Location:	3203 S.E. Woodstock Boulevard Portland, Oregon
Dates:	December 8 – 11, 2014
Inspector:	Craig Bassett
Approved by:	Kevin Hsueh, Chief Research and Test Reactors Oversight Branch Division of Policy and Rulemaking Office of Nuclear Reactor Regulation

Enclosure

EXECUTIVE SUMMARY

Reed College
Reed Research Reactor Facility
Report No.: 50-288/2014-202

The primary focus of this routine, announced inspection included onsite review of selected aspects of Reed College's (the licensee's) Class II research reactor safety program. This included a review of: organization and staffing, review and audit and design change functions, conduct of operations, operator requalification program, fuel handling, maintenance and surveillance, procedures, experiments, and emergency preparedness. The licensee's program was acceptably directed toward the protection of public health and safety and in compliance with U.S. Nuclear Regulatory Commission requirements.

Organization and Staffing

- The organization and staffing remain in compliance with the requirements specified in Technical Specifications 6.1.

Review and Audit and Design Change Functions

- Review and oversight functions required by Technical Specifications 6.2 were acceptably completed by the Reactor Operations Committee. Audits were being completed as required.

- The design change program being implemented at the facility satisfied NRC requirements.

Conduct of Operations

- Operations were being conducted in accordance with Technical Specification and procedural requirements.

Operator Requalification Program

- The operator requalification/training program was up-to-date and being acceptably implemented and documented.

- Biennial medical examinations were being completed as required.

Fuel Handling

- Reactor fuel movements and inspections were conducted and documented in accordance with procedure.

- Twenty-five percent of the fuel elements were being inspected on an annual basis.

Maintenance and Surveillance

- Maintenance was being completed as needed.

- The surveillance program, including calibration of equipment, was being completed in accordance with Technical Specifications Sections 3 and 4.

Procedures

- Facility procedures were available for the safe operation of the reactor as required by Technical Specifications 6.4.

Experiments

- The program for the control of experiments satisfied Technical Specifications 3.6, 4.6, and 6.5 and other regulatory requirements.

Emergency Preparedness

- The Emergency Plan and Emergency Implementation Procedures were being audited and reviewed annually as required.

- Letters of agreement documenting emergency support to be provided by offsite agencies were being maintained and periodically updated.

- Annual drills were being held and documentation of the drills and the follow-up critiques was maintained. Subsequent corrective actions were taken as needed.

- Emergency preparedness training for staff and offsite personnel was being conducted as stipulated in the Emergency Plan.

REPORT DETAILS

Summary of Facility Status

Reed College's (the licensee's) 250 kilowatt TRIGA Mark I research reactor continued normal, routine operations. The reactor was 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 on different days at varying power levels to support experiments and to facilitate reactor operator examinations.

1. Organization and Staffing

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

To verify the organization and staffing requirements specified in Technical Specifications (TS) 6.1 were being met, the inspector reviewed selected aspects of the following:

- Main (Reactor Console) Log – Numbers (Nos.) 81 – 86
- Organization of the Reed Research Reactor (RRR) Facility and staffing during reactor operations
- Administrative controls and management responsibilities specified in the TS and facility procedures
- RRR Administrative Procedures, Section 1, "Personnel," and Section 3, "Reactor Operations"
- RRR Standard Operating Procedure (SOP) 60, "Logbook Entries," latest revision dated April 14, 2010
- RRR Annual Report for the period from July 1, 2012, through June 30, 2013, submitted to the U.S. Nuclear Regulatory Commission (NRC) on August 7, 2013
- RRR Annual Report for the period from July 1, 2013, through June 30, 2014, submitted to the NRC on July 23, 2014

b. Observations and Findings

Through discussions with licensee representatives, the inspector determined that management responsibilities and the organizational structure at the RRR facility had not changed since the previous NRC inspection in October 2013 (Inspection Report No. 50-288/2014-201). 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 Faculty. This organization was consistent with that specified in the TS.

It was noted that the person who had been the Reactor Operations Manager had left the facility. The licensee currently had the position listed and was in the process of finding a replacement. The licensee had notified the NRC of this action, as required, by submitting a letter dated December 8, 2014, indicating the change.

The licensee's current operational organization consisted of the Facility Director, a Radiation Safety Officer, an Operations/Reactor Supervisor, a Training Supervisor, an Assistant Training Supervisor, a Projects Supervisor, and a Requalification Supervisor. The Facility Director and Radiation Safety Officer positions were full-time while the rest were part-time positions filled by students. Except for the Radiation Safety Officer, in addition to their administrative duties, the aforementioned individuals were qualified senior reactor operators (SROs). It was noted that there were also 11 other SROs and 16 reactor operators (ROs) qualified to operate the RRR.

c. Conclusion

Organization and staffing met the requirements specified in TS 6.1.

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 facility modifications and change reviews were consistent with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59 and TS 6.2, the inspector reviewed selected portions of:

- Maintenance Log pages completed for unscheduled work
- Corrective Action Reports (CARs) for 2013 and to date in 2014
- Design changes reviewed under 10 CFR 50.59 for 2013 and 2014
- Reactor Operations Committee (ROC) meeting minutes from November 2011 through November 2014
- RRR Administrative Procedures, Section 1, "Personnel"; Section 2, "Reactor Review Committee"; and Section 9, "Record Retention"
- RRR SOP 62, "Changes, Tests, and Experiments," and RRR SOP 69, "Corrective Action Report"
- RRR Annual Reports for the last two reporting periods

b. Observations and Findings

(1) Review and Audit Functions

The inspector reviewed ROC meeting minutes from November 2011 through November 2014. These meeting minutes showed that the committee was meeting at the required frequency and was considering the types of topics outlined by the TS.

The inspector noted that, since the last NRC inspection, the appropriate audits had been completed by the ROC and an external auditor in the various areas outlined in the TS. The audits were designed so that most aspects of the licensee's operations and safety programs were reviewed every year. Various facility documents, such as the Radiation Protection

Program, the Emergency Plan, the Fire Plan, the Administrative Procedures, the Requalification Plan, and the Reactor Experiments and Log were typically reviewed. Various SOPs were also reviewed. The inspector noted that the audits and the resulting findings were detailed and that the licensee responded and took corrective actions as needed.

(2) Design Changes

The inspector reviewed the licensee's 10 CFR 50.59 screening forms concerning changes or modifications that had been initiated at the facility for 2013 and to date in 2014. The results indicated that none of the screenings required further evaluation under 10 CFR 50.59. The inspector also reviewed the Maintenance Log pages that had been completed for unscheduled work of various systems. The forms contained a section which required a 50.59 Screen to be completed prior to initiating the work. None of the maintenance items reviewed required any further actions, such as a 50.59 evaluation, to be completed. None of the changes reviewed by the inspector met any of the criteria of 10 CFR 50.59(c)(2), which would have required a license amendment from the NRC.

c. Conclusion

Review and oversight functions required by TS 6.2 were acceptably completed by the ROC and the RSC. Audits were being completed as required. The licensee's design change program satisfied NRC requirements.

3. Conduct of Operations

The inspector reviewed selected aspects of the following to verify operation of the reactor in accordance with TS Sections 3, 4, and 6.1:

a. Inspection Scope (IP 69001)

- Main (Reactor Console) Log Nos. 81 – 86
- Various SCRAM Response Forms for 2013 and 2014
- Corrective Action Reports for 2013 and to date in 2014
- Maintenance Log pages completed for unscheduled work
- Selected Startup Checklist Forms for the period from January 2013 through the present
- Selected Shutdown Checklist Forms for the period from January 2013 through the present
- RRR Administrative Procedures, Section 3, "Reactor Operations"
- Various RRR SOPs and Appendices including SOP 1, "Reactor Operations"; SOP 20, "Startup Checklist"; SOP 20, Appendix A, "Startup Checklist Form"; SOP 21, "Same Day Startup Checklist"; SOP 21, Appendix A, "Same-Day Startup Checklist Form"; SOP 22, "Shutdown Checklist"; SOP 22, Appendix A, "Shutdown Checklist Form"; SOP 23, "Weekly Checklist"; SOP 23, Appendix A, "Weekly Checklist Form";

SOP 24, “Bimonthly Checklist”; SOP 24, Appendix A, “Bimonthly Checklist Form”; SOP 25, “Semiannual Checklist”; SOP 25, Appendix A, “Reed Research Reactor Semiannual Checklist”; SOP 26, “Annual Checklist”; SOP 26, Appendix A, “Annual Checklist Form”; SOP 33, “Nuclear Instruments”; SOP 34, “Control Rods”; SOP 60, “Logbook Entries”; and SOP 69, “Corrective Action Report”

- RRR Annual Reports for the last two reporting periods

b. Observations and Findings

The inspector reviewed selected reactor operating records from January 2013 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 the completion of a daily Startup Checklist and routine reactor operations in progress during the inspection. These activities were carried out in accordance with written procedures as required by TS 6.4. The checklists were completed and signed off by the appropriate personnel as required.

Information on the operational status of the facility was generally recorded properly on the log sheets and/or checklists as required by procedure. Scrams were identified in the logs 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 TS Section 6.1.

c. Conclusion

Reactor staffing, operations, and logs were acceptable.

4. Operator Requalification Program

a. Inspection Scope (IP 69001)

The inspector reviewed selected portions of the following regarding the RRR Requalification Plan to ensure that the requirements of the plan and 10 CFR 55.59 were being met:

- Active license status of all current operators
- Medical examination records for selected operators
- Training lectures and records for the current training cycle
- NRC Form 398, “Personal Qualification Statement – Licensee”
- Written examinations given during 2012 and 2013 for selected operators
- RRR Facility Requalification Plan, dated July 2009
- NRC Form 396, “Certification of Medical Examination – by Facility Licensee”
- RRR Facility Requalification Meeting Agenda and Attendance Sheets for September 2012 through November 2014

- "Requalification Hours and Reactivity Manipulation" Sheets documenting reactivity manipulations for 2012 through the present for selected operators
- RRR Administrative Procedures, Section 9, "Record Retention"
- Various RRR SOPS including: SOP 63, "Requalification"; SOP 63 Appendix A, "Reactor Operator Physical Exam"; and SOP 63, Appendix B, "Accelerated Requalification Form"

b. Observations and Findings

There are currently 17 qualified SROs and 16 qualified ROs at the RRR facility. The inspector reviewed selected operators' licenses and noted that they were current.

The inspector reviewed the requalification program for July 2012 through June 2013 and for July 2013 through June 2014, as well as the annual drill scenarios and attendance sheets. It was noted that operators typically made entries on the "Requalification Hours and Reactivity Manipulation Sheet" that was located in the control room. Through these actions the hours "on duty" and in what capacity (i.e., RO/SRO), as well as the tasks performed, were documented. The inspector also reviewed the Requalification Meeting Agenda and Attendance Sheets for the period from September 2012 through November 2014. The inspector reviewed various individual operators' requalification records as well.

The review of the various logs and records noted above showed that training had been conducted in accordance with the licensee's requalification and training program. Training reviews and examinations had been completed and documented as required. The records indicated that operators were completing the required activities, including reactivity manipulations and number of operating hours. Records indicated that annual operations tests and supervisory observations were being completed. Biennial written examinations were also being completed as required or credit was taken by the licensee for the exams administered by the NRC to satisfy the requalification cycle exam requirements when applicable. Additionally, the inspector noted that operators were receiving the required biennial medical examinations within the required time frame.

c. Conclusion

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

5. Fuel Handling

a. Inspection Scope (IP 69001)

In order to verify adherence to fuel handling and inspection requirements specified in TS 4.1, the inspector reviewed selected aspects of:

- Fuel Element Inspection Cards

- Main (Reactor Console) Log Nos. 79 – 86
- Fuel Element Inspection sheet maintained in the appropriate Fuel Inspection Binder
- RRR Administrative Procedures Section 6, "Fuel and Special Nuclear Material"
- RRR SOP 35, "Fuel and Core"; SOP 35, Appendix A, "Core Diagram"; SOP 35, Appendix B, "Fuel Handling Checklist"; SOP 35, Appendix C, "Fuel Handling SRO Qualification"; and SOP 35, Appendix D, "Fuel Handling Receipt Form"

b. Observations and Findings

Through review of the main logs and interviews with licensee personnel, the inspector verified that fuel movements were conducted in compliance with procedure. The inspector also verified that the licensee was maintaining the required records of fuel movements as they were completed. The logs were being filled out properly to indicate which elements were moved and to what locations.

Also through records review, it was noted that the reactor fuel was being inspected upon initial receipt and twenty-five percent (25%) of the fuel elements in the core were being inspected annually. This exceeded the percentage of fuel elements required to be inspected as stipulated by TS 4.1. The last annual fuel inspection was completed during January 13-16, 2014. The inspector verified that all fuel elements were inspected at least once every 5 years, including elements in storage and/or removed from service as required.

c. Conclusion

Reactor fuel movements and inspections were completed and documented in accordance with procedure and the fuel was being inspected more frequently than required by TS 4.1.

6. Maintenance and Surveillance

a. Inspection Scope (IP 69001)

To verify that operations, surveillance activities, and calibrations were being completed as required by the TS, the inspector reviewed selected portions of:

- Main (Reactor Console) Log Nos. 81 – 86
- Maintenance Log pages completed for unscheduled work
- Associated surveillance and calibration data and records for 2013-2014
- "Other Checklists" Notebook which contained calibration forms, inspection forms, and various checklists
- Various RRR SOPs and Appendices including: SOP 23, "Weekly Checklist"; SOP 23, Appendix A, "Weekly Checklist Form"; SOP 24, "Bimonthly Checklist"; SOP 24, Appendix A, "Bimonthly Checklist Form"; SOP 25, "Semiannual Checklist"; SOP 25, Appendix A, "Reed Research

Reactor Semiannual Checklist"; SOP 26, "Annual Checklist"; SOP 26, Appendix A, "Annual Checklist Form"; SOP 34, "Control Rods"; SOP 34, Appendix A, "Control Rod Calibration Form"; SOP 34, Appendix B, "Control Rod Inspection Checklist"; and SOP 34, Appendix C, "Control Rod Inspection Form"

- RRR Annual Reports for the last two reporting periods

b. Observations and Findings

The licensee conducted various maintenance and surveillance activities which were then documented on the appropriate forms and checklists. The inspector verified that these activities were conducted within the time frame required and according to procedure. The inspector reviewed selected weekly, bimonthly, semiannual, and annual forms and checklists. All the recorded results reviewed were within the TS and procedurally prescribed parameters. The records and logs reviewed appeared to be complete and were being maintained as required.

The inspector observed a Startup Checklist performed during the inspection. A portion of the checklist was completed in the control room and the other portion in the reactor bay. The required checks were conducted and the data was documented. Previously completed Startup and Shutdown Checklists were also reviewed. These activities appeared to have been conducted appropriately and in accordance with procedure.

A review of the RRR Facility Main Logs and current Maintenance Logbook showed that these records were also being completed as required and problems, if any, were being documented. Through observation and records review, the inspector also confirmed that maintenance was being conducted as needed, consistent with the TS.

c. Conclusion

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

7. Procedures

a. Inspection Scope (IP 69001)

To determine whether facility procedures met the requirements outlined in TS 6.4, the inspector reviewed portions of:

- Procedural reviews and updates documented in the ROC meeting minutes
- RRR Administrative Procedures, Section 8, "Adoption and Revision of Operating Procedures," and Section 9, "Record Retention"
- Various RRR SOPs and Appendices including: SOP 60, "Logbook Entries"; SOP 61, "Procedure Writing and Use"; SOP 61, Appendix A,

"Document Structure"; SOP 61, Appendix B, "Document Locations"; and SOP 61, Appendix C, "Temporary Procedure Change"

b. Observations and Findings

Procedures were in effect for those activities specified in TS 6.4 as required. RRR Administrative Procedures and SOPs were found to be acceptable for the current staffing level and status of the facility. The Administrative Procedures and SOPs specified the responsibilities of the various members of the staff. Substantive changes to procedures were being reviewed and approved by the ROC. The procedures were being audited, reviewed, and updated as needed.

The inspector reviewed the temporary procedure changes that had been promulgated during the past 12 months. The changes were written after minor problems with the procedures were noted. The temporary changes were typically incorporated in the referenced procedures if deemed appropriate by the licensee. Changes suggested as a result of the ROC and independent audits were also incorporated into the procedures if deemed appropriate.

As noted previously, the inspector observed various activities during this inspection, including reactor startup and operation. It was noted that these activities were completed in accordance with the applicable procedures and checklists.

c. Conclusion

Facility procedures for the safe operation of the reactor were available as required by TS 6.4. Procedural compliance was acceptable.

8. Experiments

a. Inspection Scope (IP 69001)

In order to verify that experiments were being conducted within approved guidelines specified in TS 3.6, 4.6, and 6.5, the inspector reviewed selected portions of:

- Experiment review and approval by the ROC
- Selected Irradiation Request Forms for 2011 and 2012
- Approved RRR Routine Experiments (RE), including: RE 1, "Irradiation with Neutrons"; RE 2, "Irradiation with Gammas"; RE 3, "Fuel, Graphite, or Source Material"; RE 4, "Reactor Power Measurement"; RE 5, "Control Rod Worth Measurement"; RE 6, "Pool Parameter Measurement"; RE 7, "Fuel Loading"; RE 8, "Cerenkov Radiation Spectrum Acquisition"; RE 9, "Neutron Induced Auto-Radiography"; and RE 10, "Radial Flux Measurements"
- Approved RRR Special Experiments (SE), including: SE 1, "Fuel Loading"; SE 2, "Rod Calibration"; SE 3, "Subcritical Multiplication"; and SE 4, "Core Temperature Measurements"

- RRR Administrative Procedures, Section 4, “Reactor Experiments”; and Section 9, “Record Retention”
- Various RRR SOPs and Appendices including: SOP 10, “Irradiation Preparation”; SOP 10, Appendix A, “Irradiation Request Form”; SOP 10, Appendix B, “Rabbit Irradiation Request Form”; SOP 10, Appendix C, “Gamma Irradiation Request Form”; SOP 10, Appendix D, “Irradiation Request Log”; SOP 11, “Irradiation Analysis”; SOP 12, “Lazy Susan”; SOP 13, “Rabbit”; SOP 13, Appendix A, “Rabbit Irradiations Qualification Form”; SOP 13, Appendix B, “Rabbit System Diagram (Insertion)”; SOP 13, Appendix C, “Rabbit System Diagram (Withdrawal)”; SOP 14, “Central Thimble”; SOP 15, “Beam”; SOP 15, Appendix A, “Beam Irradiation Request Form”; SOP 16, “Near Core”; and SOP 17, “Gamma Irradiations”

b. Observations and Findings

The inspector noted that the various experiments conducted at the facility were being reviewed and approved as required. It was also noted that two new Routine Experiments had recently been proposed by licensee staff and students. These had been reviewed and approved by the Facility Director and the ROC as required.

Through a review of console logs and various irradiation request forms, 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, disposed of as stipulated by procedure, or held for decay.

c. Conclusion

The license’s program for the control of experiments generally satisfied TS 3.6, 4.6, and 6.5 and other regulatory requirements.

9. Emergency Preparedness

a. Inspection Scope (IP 69001)

To verify compliance with the Reed Reactor Facility Emergency Plan (E-Plan), the inspector reviewed selected aspects of:

- Emergency response training records for the past 2 years
- Emergency drills and exercises held during 2013 and 2014
- Emergency response facilities, supplies, equipment and instrumentation
- RRR SOP 25, “Semiannual Checklist”
- RRR Facility E-Plan last revised August 2014
- RRR SOP 25, Appendix A, “Reed Research Reactor Semiannual Checklist”

- RRR E-Plan, Appendix A, listing the most recent Agreement Letters with off-site support organizations
- RRR E-Plan, Appendix B, Emergency Implementation Procedures (EIPs), dated October 1, 2014

b. Observations and Findings

The E-Plan in use at the reactor had been updated and reviewed and approved by the ROC. The licensee had determined that there was no decrease in effectiveness as defined in 10 CFR 50.54(q). The licensee had submitted a letter to the NRC documenting this determination on August 18, 2014.

Based on review of the E-Plan, it was noted that there were no accidents that could cause an "Alert" classification for the facility. However, it was noted that there were various Emergency Implementation Procedures (EIPs) which indicated that, in certain situations, the classification for the event would be "Alert." The licensee acknowledged these inconsistencies and agreed to correct the problem. The licensee was informed that correcting these issues would be followed by the NRC as an Inspector Follow-up Item (IFI) and would be reviewed during a subsequent inspection (IFI 50-288/2014-202-01).

The E-Plan and EIPs were being audited and reviewed annually as required. Supplies, instrumentation, and equipment staged for emergency use 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. The inspector reviewed the Agreement Letters that had been signed with various emergency support organizations. These agreements were being maintained and updated as needed.

Communications capabilities were acceptable and had been tested and emergency information updated as stipulated in the E-Plan. It was noted that the Emergency Notification Call List, posted in various locations throughout the facility, was current and had last been updated on October 1, 2014.

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 exercises and to develop possible solutions to any problems identified. The results of these critiques were documented and reported to the RSC/ROC. 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 and the Facility Director visited an off-site fire department unit. The inspector observed the equipment maintained by the unit for response to an emergency at the facility. From this visit, and as a result of reviewing the licensee's records documenting drills and training, the inspector verified that fire

department personnel were well trained, properly equipped, and knowledgeable of the actions to take in case of an emergency at the reactor facility. The inspector determined that the licensee was maintaining a good working relationship with this support group.

c. Conclusion

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

10. Follow-up on Previously Identified Items

a. Inspection Scope (IP 92701)

The inspector reviewed the actions taken by the licensee to address previously identified items including an Inspector Follow-up Item (IFI) and a Violation (VIO).

b. Observation and Findings

(1) 50-288/2012-201-01 – VIO – Failure to conduct a 10 CFR 50.59 evaluation prior to the reconfiguration of the reactor core.

During an inspection in December 2012, the inspector noted that the licensee should have completed a 10 CFR 50.59 evaluation to fully review the reconfiguration of the core prior to loading more than the original 64 elements. The evaluation should have included, for example, a neutronic evaluation and thermal hydraulic analysis. The inspector determined that the failure to fully evaluate this change as required by 10 CFR 50.59 was of more than minor significance because the change could have resulted in changes to core characteristics, which may have required prior NRC approval. The failure to conduct a 10 CFR 50.59 evaluation was determined to be a violation of NRC requirements.

During this inspection the inspector reviewed the progress made by the licensee regarding the conduct of 50.59 reviews. It was noted that a subsequent change to the core loading involving one fuel element was reviewed to determine whether a full evaluation was needed. It was also noted that the licensee had revised their SOP regarding 10 CFR 50.59 reviews and added very prescriptive text to ensure that a proper review would be completed and an evaluation performed if deemed necessary. In addition, a new maintenance form was created which required that all operators doing maintenance screen the maintenance activities to determine whether further review and evaluation was needed. The licensee's actions to revise their procedures and forms to require more complete review and evaluation appeared to be appropriate. This issue is considered closed.

(2) 50-288/2012-201-04 – IFI – Follow-up on the issue of ensuring that the proper documentation, i.e., completion of the Shutdown Checklist, is completed as required by licensee procedures.

During the inspection in December 2012, during the review of the licensee's Corrective Action Reports, the inspector noted that on October 12, 2011, and again on October 27, 2011, the reactor was operated and no Shutdown Checklist was completed before the end of the day, contrary to licensee procedures.

The licensee investigated the problem and determined that there were various problems with the way Shutdown Checklists were handled. The licensee initiated various corrective actions and the Operations Supervisor was assigned the responsibility for ensuring that the Shutdown Checklist was performed. These actions were completed on October 28, 2011. The procedure was revised to require that all operations and checklists be on the schedule. This was completed on April 11, 2012, when the revision of the procedure was approved. Notwithstanding these corrective actions, on December 4, 2012, a Shutdown Checklist was not completed.

The licensee was informed that the issue of ensuring that the proper documentation (i.e., completion of the Shutdown Checklist) was completed as required by licensee procedures would be followed by the NRC as an Inspector Follow-up Item (IFI).

During this inspection the inspector reviewed the progress made by the licensee regarding ensuring that Shutdown Checklists were completed in a timely manner as required. It was noted that the licensee used a system developed at the college to schedule and track tasks like start-ups and shutdowns with the accompanying checklists. When an operator completes a task such as a shutdown checklist, the operator is required to note the completion on the system. The system was modified to automatically generate an electronic message (e-mail) to notify the supervisors when a checklist had not been completed. This has been successful to date in alleviating problems such as failing to complete the appropriate checklists and other required tasks. The licensee's actions appeared to be appropriate. This issue is considered closed.

c. Conclusions

One VIO and one IFI were reviewed. These issues are considered closed.

11. Exit Interview

The inspection scope and results were summarized on December 11, 2014, with the Facility Director, the Radiation Safety Officer, and the Dean of Faculty. 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. Barrett	Operations Supervisor
H. Choi	Projects Supervisor
W. Horner	Requalification Supervisor
M. Krahenbuhl	Director, Reed Reactor Facility
A. Mariana	Training Supervisor
N. Nicholson	Dean of the Faculty, Reed College

Other Personnel

K. Fisher	Radiation Safety Officer and Campus Environmental Director
B. Profit	Training Lieutenant, Portland Fire and Rescue, Training, Safety, and EMS Division, City of Portland

INSPECTION PROCEDURE USED

IP 69001 Class II Non-Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-288/2014-202-01	IFI	Follow-up on the licensee's actions to correct the inconsistencies between the Emergency Plan and the Implementing Procedures dealing with the "Alert" classification of various events.

Closed

50-288/2012-201-01	VIO	Failure to conduct a 10 CFR 50.59 evaluation prior to the reconfiguration of the reactor core.
50-288/2012-201-04	IFI	Follow-up on the issue of ensuring that the proper documentation, i.e., completion of the Shutdown Checklist, is completed as required by licensee procedures

LIST OF ACRONYMS USED

10 CFR	Title 10 of the *Code of Federal Regulations*
ADAMS	Agencywide Documents Access and Management System
AMR	American Medical Response
CAR	Corrective Action Report
E-Plan	Emergency Plan
EIP	Emergency Implementation Procedures

IFI	Inspector Follow-up Item
IP	Inspection Procedure
NCV	Non-Cited Violation
No.	Number
NRC	U.S. Nuclear Regulatory Commission
RE	Routine Experiment
RO	Reactor Operator
ROC	Reactor Operations Committee
RRC	Reactor Review Committee
RRR	Reed Research Reactor
RSC	Radiation Safety Committee
SE	Special Experiment
SOP	Standard Operating Procedure
SRO	Senior Reactor Operator
SSC	Structure, System, or Component
TS	Technical Specifications