

U. S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-288

License No: R-112

Report No: 50-288/99-201

Licensee: Reed College

Facility: Reed College Reactor Facility

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

Dates: January 25-28, 1999

Inspector: Craig Bassett, Senior Non-Power Reactor Inspector

Approved by: Seymour H. Weiss, Director
Non-Power Reactors and Decommissioning
Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

This routine, announced inspection included onsite review of various aspects of the licensee's programs concerning the conduct of operations and emergency preparedness as they relate to the licensee's Class 2 non-power research reactor. The licensee's programs were 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.

Conduct of Operations

- Staffing, reporting, and record keeping met requirements specified in Technical Specifications (TS) Section I. Maintenance was being completed as required.
- Review and oversight functions required by TS Sections I.2 - I.4 were acceptably completed by the Reactor Operations Committee. 10 CFR 50.59 changes had been reviewed and approved by the Committee as required and none were determined to constitute an unreviewed safety question.
- The requalification/training program was up-to-date and acceptably maintained. Medical examinations were being completed as required.
- Facility procedures and document reviews satisfied TS Section I.5 requirements. Procedural compliance was acceptable.
- Reactor fuel movements and inspections were made and documented in accordance with procedure. One-fifth of the fuel elements were being inspected on a biennial basis as allowed by TS Section E.3.
- The program for surveillance and calibration of equipment was being implemented in accordance with TS requirements.
- The program for the control of experiments satisfied regulatory requirements and licensee commitments.
- No problems with respect to the Year 2000 concerns had been identified in the area of reactor operations.

Emergency Preparedness

- The Emergency Plan was found to be acceptable by the NRC after the last major revision in 1996.
- The Implementing Procedures were being updated as needed and were adequate to implement the provisions of the Emergency Response Plan.

- Emergency response facilities and equipment were being maintained as required and responders were knowledgeable of proper actions to take in case of an emergency.
- Reed College maintained current Letters of Agreement with offsite agencies that showed that support would be available in case of an emergency.
- Annual drills were being conducted and critiques were being held as required by the Emergency Plan.
- Emergency preparedness training for off-site and staff personnel was being completed as required.

Report Details

Summary of Plant Status

The licensee's two hundred and fifty kilowatt (250 kW) TRIGA Mark-I non-power reactor (NPR) continued normal, routine operations. A review of the applicable records indicated that 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 several hours one day at varying power levels for training purposes and irradiation of experimental samples.

1. Conduct of Operations

a. Organization, Operations, and Maintenance Activities (Inspection Procedure [IP] 69001)

(1) Inspection Scope

To verify staffing, reporting, and record keeping requirements specified in Technical Specifications (TS) Section I.1 were being met, the inspector reviewed:

- organization and staffing for the Reed Reactor Facility,
- administrative controls and management responsibilities, and
- the reactor console and maintenance logs.

(2) 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 1997 (Inspection Report No. 50-288/97-202). 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, a Radiation Safety Officer (RSO), and a Contract Health Physicist. Of these individuals, the Facility Director, Associate Director, and Reactor Supervisor are currently Senior Reactor Operators (SROs). In addition, there are six other SROs and eleven Reactor Operators (ROs) qualified to operate the facility NPR. The Facility Director, Associate Director, and Radiation Safety Officer are full-time positions while all the others are part time. This organization was consistent with that specified in the TS.

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 administrative control over operational aspects of the facility.

A review of the RRF reactor console and maintenance logs showed that they were being maintained as required and problems, if any, were being documented. This review also demonstrated that maintenance was being conducted consistent with the TS and applicable procedures.

(3) Conclusions

Staffing, reporting, and record keeping met the requirements specified in TS Section I. Maintenance was being completed as required.

b. Review, Audit, and Design Change Functions (IP 69001)

(1) Inspection Scope

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 the TS Sections I.2 - I.4, the inspector reviewed:

- Reactor Operations Committee meeting minutes,
- Radiation Safety Committee meeting minutes,
- completed audits and reviews, and
- design changes reviewed under 10 CFR 50.59.

(2) Observations and Findings

The inspector reviewed the Reactor Operations Committee's (ROC's) and the Radiation Safety Committee's (RSC's) meeting minutes from September 1997 to the present. These meeting minutes showed that the ROC and the RSC had met at the required frequency and had considered the types of topics outlined by the TS. During the review, the inspector noted that a meeting of the ROC had held in May 1998 but no minutes were available to document the results of the meeting. A memorandum was written to file to document that the meeting took place on May 29, 1998, for the purpose of reviewing and approving audits. A quorum was present and the audits were approved but no other meeting minutes were recorded.

The inspector noted that both committees completed audits of different but complimentary aspects of the reactor facility operations, programs, and procedures. The inspector noted that, since the last NRC inspection, audits had been completed by the ROC and the RSC in those areas outlined in the TS. The audits were structured so that all 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.

Through review of applicable records and interviews with licensee personnel, the inspector determined that all design changes 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 procedure. It was noted that none of the changes were determined to constitute an unreviewed safety question.

One 10 CFR 50.59 review involved an amendment to the TS. This had also been reviewed and approved by the ROC. The amendment was subsequently submitted to the NRC and was approved by the NRC in a letter to the licensee dated September 17, 1998.

(3) Conclusions

Review and oversight functions required by TS Sections 1.2 - 1.4 were acceptably completed by the ROC. 10 CFR 50.59 changes had been reviewed and approved by the ROC as required and none were determined to constitute an unreviewed safety question.

c. Operator Licenses, Requalification, and Medical Activities (IP 69001)

(1) Inspection Scope

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

- active license status,
- logs and records of reactivity manipulations,
- written examinations,
- training lectures and records, and
- medical examination records.

(2) Observations and Findings

As noted above, there are currently eight qualified SROs and eleven ROs at the RRF. All of the operators' licenses were current but one was scheduled to expire in March 1999. The licensee was aware of this situation and was taking steps to have the license renewed.

A review of the logs and records showed that training had been conducted in accordance with the licensee's requalification and training program. It was noted that lectures had been given as stipulated and that training reviews and examinations had been documented. Records of quarterly reactor operations, reactivity manipulations, other operations activities, and Reactor Supervisor activities were being maintained. Records indicating the completion of the annual operations tests and supervisory observations were also maintained. The inspector noted that operators were receiving the required medical examinations at the frequency specified by the program.

(3) Conclusions

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

d. Procedures and Procedural Compliance (IP 69001)

(1) Inspection Scope

To determine whether facility procedures met the requirements outlined in TS Section 1.5, the inspector reviewed:

- selected Standard Operating Procedures,
- selected administrative procedures, and
- procedural reviews and updates.

(2) Observations and Findings

RRF Standard Operating Procedures (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/reviewed biennially and updated as needed. It was also noted that revisions to procedures were routinely presented to the ROC and/or the RSC 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 operations 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.

(3) Conclusions

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

e. Fuel Movement (IP 69001)

(1) Inspection Scope

In order to verify adherence to fuel handling and inspection requirements specified in TS Section E.3, the inspector reviewed:

- the fuel handling and inspection SOP, and
- applicable fuel movement logs and records.

(2) Observations and Findings

The inspector determined that the licensee was maintaining the required records of the various fuel movements that had been completed and 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 were being inspected biennially as allowed by TS Section E.3. The procedure and the radiological control requirements specified for these operations were acceptable.

(3) Conclusions

Reactor fuel movements and inspections were completed and documented in accordance with procedure and the fuel was being inspected as specified by TS Section E.3.

f. Surveillance (IP 69001)

(1) Inspection Scope

To determine that surveillance activities and calibrations were being completed as required by TS Sections D - G, the inspector reviewed:

- selected surveillance procedures,
- selected surveillance data and records, and
- calibration procedures and records.

(2) Observations and Findings

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 were within the TS and procedurally prescribed parameters. The records and logs reviewed were accurate, complete, and being maintained as required.

(3) Conclusions

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

g. Experiments (IP 69001)

(1) Inspection Scope

In order to verify that experiments were being conducted within approved guidelines, the inspector reviewed:

- selected Standard Operating Procedures,
- selected administrative procedures,
- selected Routine, Modified Routine, and Special Experiments,
- experiment review and approval by the ROC,
- selected Irradiation Request Forms,
- potential hazards identification, and
- control of irradiated items.

(2) Observations and Findings

The inspector noted that all the experiments conducted were well-established procedures that had been in place for several years. No new experiments had been initiated, reviewed, or approved since the last inspection. The experiments that were conducted were completed under the cognizance of the Facility Director and the Reactor Supervisor as required. The results of the experiments were documented in the reactor operations log book.

The inspector observed the insertion of a set of experiment samples into the rotating specimen rack facility (Lazy Susan) of the reactor. It was noted that licensee personnel followed the applicable procedure and established protocol. Contamination controls were used effectively.

(3) Conclusions

The license's program for the control of experiments satisfied regulatory requirements and licensee commitments.

(8) Year 2000 Concerns Review

(1) Inspection Scope

To determine the status of the licensee's preparations to deal with the potential problems caused by the Year 2000 (Y2K), the inspector reviewed:

- the licensee's operating system,
- the licensee's security system,
- the spectroscopy system used at the facility, and
- the Reed College approach to the problem.

(b) Observations and Findings

The licensee had reviewed their operations, security, and spectroscopy systems and had concluded that the only problem concerning Y2K might exist in the spectroscopy or counting system used at the facility. In order to correct the problem, the licensee was buying new computer equipment and new counting software from the vendor, EG&G ORTEC. Nothing had been identified that would pose a problem to the reactor operations and no instances were identified that could pose a threat to public health and safety.

The security system at the facility was maintained by another vendor, Diebold, who had supplied the licensee with a letter indicating that the security system was Y2K compliant. Reed College had also analyzed the Y2K status campus-wide and was taking actions as needed.

(c) Conclusions

No problems had been identified concerning reactor operations but Y2K concerns in the area of spectroscopy were being addressed.

2. Emergency Preparedness

a. Changes to the Emergency Plan (IP 69001)

(1) Inspection Scope

To determine compliance with the requirements of 10 CFR 50.54(q) and the licensee's Emergency Plan, the inspector reviewed:

- the Emergency Plan and Implementing Procedures,
- ROC/RSC meeting minutes,
- recent revisions and updates, and
- applicable letters and documents concerning the Emergency Plan.

(2) Observations and Findings

The licensee submitted a revised Emergency Plan (E-Plan) to the NRC on March 22, 1996. By letter dated May 20, 1996, the NRC indicated that the reviewed changes were found to be acceptable and could be implemented without prior NRC approval in accordance with 10 CFR Part 50.54(q). The inspector noted that the plan was audited/reviewed annually by the RSC as required.

(3) Conclusions

The licensee's Emergency Plan was found to be acceptable by the NRC after the last major revision in 1996.

b. Emergency Plan Implementing Procedures (IP 69001)

(1) Inspection Scope

In order to verify the adequacy of the licensee's Emergency Plan Implementing Procedures, the inspector reviewed:

- the Emergency Plan,
- Emergency Plan Implementing Procedures,
- RSC meeting minutes, and
- recent revisions and updates of the Plan.

(2) Observations and Findings

The licensee had reviewed and revised the Implementing Procedures as needed. The procedures were last updated in November 1998. The inspector determined that the changes to the procedures were acceptable and appeared to be adequate to implement the provisions stipulated in the E-Plan.

(3) Conclusions

The Implementing Procedures were being updated as needed and were adequate to implement the provisions of the Emergency Response Plan.

c. Emergency Preparedness Program Implementation (IP 69001)

(1) Inspection Scope

To determine the adequacy of the licensee's Emergency Preparedness Program, the inspector reviewed:

- facilities,
- equipment,
- instrumentation,
- supplies on hand, and
- emergency response personnel training.

(2) Observations and Findings

The facilities and equipment set aside for emergency response were being maintained as required in the Emergency Plan. The equipment and materials maintained in an "emergency grab bag" were inventoried and all items required to be in the bag were in place as required.

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.

(3) Conclusions

Emergency response facilities and equipment were being maintained as required and responders were knowledgeable of proper actions to take in case of an emergency.

d. Offsite Support (IP 69001)

(1) Inspection Scope

To verify the adequacy of the offsite support that would be provided to the licensee in case of an emergency, the inspector reviewed:

- the Emergency Plan and Implementing Procedures,
- Letters of Agreement, and
- communications capabilities.

(2) Observations and Findings

Updated Letters of Agreement were on file indicating that various state and local agencies were available to respond in case of an emergency. An agreement also had been established with the Good Samaritan Hospital and the American Medical Response (AMR) Ambulance Service in case a contaminated injured person required transportation and medical treatment. Communications capabilities with these agencies were acceptable and had been tested on a periodic basis as required in the E-Plan.

(3) Conclusions

The licensee maintained current Letters of Agreement with offsite agencies that indicated that support would be available in case of an emergency.

3. Emergency Preparedness Exercises and Drills (IP 69001)

(1) Section Scope

To determine that the licensee was conducting the exercises and drills as specified in the Emergency Plan, the inspector reviewed:

- recent drill scenarios,
- the critiques of drill performance by emergency responders, and
- other associated documentation of recent drills.

(2) Observations and Findings

The inspector noted that onsite emergency drills had been conducted annually as required by the E-Plan. Critiques were held following the drills to discuss the positive and negative aspects of the exercise and to develop possible solutions to any problems identified. The licensee acknowledged the importance of conducting appropriate drills and that drills usually highlight areas for improvement.

(3) Conclusions

Annual drills were being conducted and critiques were being held as required by the Emergency Plan.

f. Emergency Preparedness Training (IP 69001)(1) Inspection Scope

In order to verify the adequacy of the licensee's emergency training, the inspector reviewed:

- the Emergency Plan,
- training records for off-site personnel, and
- training records for staff personnel.

(2) Observations and Findings

With respect to Emergency Preparedness and Response training, the inspector noted that it was being completed and documented as required. Training for off-site personnel was conducted annually and documented as required by the E-Plan. Likewise, training for staff personnel was being completed annually and records were being maintained.

(3) Conclusions

Emergency preparedness training for off-site and staff personnel was being completed as required.

3. Follow-up on Previously Identified Items1. Inspection Scope (92701, 92702)

The inspector reviewed the licensee's actions taken in response to a previously identified Inspector Follow-up Item and previous violations.

b. Observation and Findings

- (1) (Closed) Violation (VIO) 50-288/97-202-01 - Failure of the RSC to meet twice yearly to review safety aspects of the facility operation.

During a previous inspection in 1997 it was noted that the RSC had not met twice yearly as required. In order to correct this apparent problem the licensee added the meetings to the RRF Planning Schedule. As noted above, during this inspection it was determined that the RSC was meeting at the required frequency. This item is considered closed.

- (2) (Closed) VIO 50-288/97-202-02 - Failure to follow procedure due to failure to perform the biweekly wipe tests within the 18-day time frame allowed by procedure and failure to have a Radiation Work Permit reviewed and approved by the Director.

During the aforementioned inspection it was noted that various biweekly wipe tests had not been conducted within the time frame allowed by procedure. Also, a Radiation Work Permit (RWP) had not been reviewed and approved as required by procedure. The inspector reviewed the actions taken by the licensee to correct the problem including placing two moveable signs on the wall calendar in the Control Room to remind staff personnel when the tests are due. The procedure concerning writing and approval of RWPs was revised to clarify who may review and approve an RWP. The inspector also reviewed the completion of the biweekly wipe test for 1998 and to date in 1999 and recently approved RWPs. No inconsistencies were noted and the previous problems appeared to have been resolved. This item is considered closed.

- (3) (Closed) Inspector Follow-up Item (IFI) 50-288/97-202-04 - Follow-up on the licensee's actions to review and correct the release data documented in the past two annual reports.

Also during the previous inspection it was noted that the release data documented in certain annual reports were not accurately portrayed. The licensee subsequently submitted a corrected version of the data in question by letter dated January 21, 1998. This item is considered closed.

4. (Closed) VIO 50-288/97-202-06 - Failure to submit the Material Status Reports within 30 days after the end of the period covered by the reports.

During the inspection in 1997 it was also noted that the licensee was not submitting the required Material Status Reports to the appropriate authority within the time frame stipulated by the regulations. In order to correct this problem the licensee added the meetings to the RRF Planning Schedule. The inspector verified that the RRF Planning Schedule had been revised and reviewed recent submittals of the Material Status Reports. The reports had been submitted within 30 days after the end of the reporting period. This item is considered closed.

4. Exit Interview

The inspection scope and results were summarized on January 28, 1999, with a licensee representative. 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

S. Cook, Reactor Supervisor
S. Frantz, Facility Director, Reed Reactor Facility
C. Melhus, Associate Director, RRF
M. Parrott, Reactor Health Physicist, RRF
P. Steinberger, Dean of the Faculty, Reed College

INSPECTION PROCEDURE USED

IP 69001 Class II Non-Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

| | | |
|------------------|-----|---|
| 50-288/97-202-01 | VIO | Failure of the RSC to meet twice yearly to review safety aspects of the facility operation. |
| 50-288/97-202-02 | VIO | Failure to follow procedure due to failure to perform the biweekly wipe tests within the 18-day time frame allowed by procedure and failure to have RWP #2 reviewed and approved by the Director. |
| 50-288/97-202-04 | IFI | Follow-up on the licensee's actions to review and correct the release data documented in the past two annual reports. |
| 50-288/97-202-06 | VIO | Failure to submit the Material Status Reports within 30 days after the end of the period covered by the reports. |

LIST OF ACRONYMS USED

| | |
|--------|-------------------------------|
| AMR | American Medical Response |
| CFR | Code of Federal Regulations |
| E-Plan | Emergency Plan |
| IFI | Inspector Follow-up Item |
| IP | Inspection Procedure |
| kW | Kilowatt |
| NPR | Non-Power Reactor |
| NRC | Nuclear Regulatory Commission |
| RO | Reactor operator |
| ROC | Reactor Operations Committee |
| RRF | Reed Reactor Facility |
| RSC | Radiation Safety Committee |
| RSO | Radiation Safety Officer |
| RWP | Radiation Work Permit |
| SOP | Standard Operating Procedure |
| SRO | Senior reactor operator |
| TS | Technical Specifications |
| VIO | Violation |

**INSPECTION FOLLOW-UP SYSTEM (IFS)
SPEED CLOSEOUT / UPDATE FORM**

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| DOCKET NUMBERS | 5 | 0 | - | 0 | 2 | 8 | 8 | RESPONSIBLE INDIVIDUAL: <u>C. Bassett</u> REVIEWED BY: <u>S. Weiss</u> FACILITY: <u>Reed College</u> |
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| AFFECTED UNITS (1/2/3) | | | ITEM TYPE | INSPECTION ITEM NUMBER | | | | | | | | | | CLOSEOUT / UPDATE REPORT NO. | | | | INSPECTION END DATE | ITEM STATUS | |
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(FOR ESCALATED ITEMS ONLY)

| AFFECTED UNITS (1/2/3) | ITEM TYPE | EA NUMBER | | | | | NOV ID NUMBER | | | | | CLOSEOUT / UPDATE REPORT NO. | | | | INSPECTION END DATE | ITEM STATUS |
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