

U. S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-243

License No: R-106

Report No: 50-243/98-202

Licensee: Oregon State University

Facility: TRIGA Mark-II Reactor Facility

Location: Radiation Center, Oregon State University
Corvallis, Oregon

Dates: November 30 - December 3, 1998

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

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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 one and one-tenth megawatt (1.1Mw) 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 6.
- Review and oversight functions required by TS Section 6.2 were acceptably completed by the Reactor Operations Committee. 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.
- 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 6 requirements. Procedural compliance was acceptable.
- Reactor fuel movements were made and documented in accordance with procedure and the fuel was being inspected on an as-needed basis as allowed by TS Section 4.4.
- The program for surveillance and Limiting Conditions for Operation confirmations was being implemented in accordance with TS requirements.
- The program for the control of experiments satisfied regulatory requirements and licensee commitments.

Emergency Preparedness

- The licensee's Emergency Response Plan was found to be acceptable by the NRC after the last major revision in 1996. Another revision is being prepared for submittal to the NRC in the near future.
- The Implementing Procedures were being updated as required and were adequate to carry out 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.
- The licensee maintained current Letters of Agreement with offsite agencies that showed that support would be available in case of an emergency.

- Annual drills were held but the documentation for the 1997 drill was not available and the 1998 drill had not been held to date. An Inspector Follow-up Item was established to review the results of the 1997 drill and verify that the appropriate degree of difficulty was included in the drill.
- Documentation of emergency preparedness training for off-site personnel was identified as an Inspector Follow-up Item.

Report Details

Summary of Plant Status

The licensee's 1.1 Mw TRIGA Mark-II non-power reactor (NPR) continued normal, routine operations. A review of the applicable records indicated that the reactor was typically operated approximately six hours per day, five days per week, in support of laboratory testing, reactor system testing, reactor surveillances, and sample irradiations. During this inspection, the reactor was started up and operated several hours a day at varying power levels for training and sample irradiation.

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 6 were being met, the inspector reviewed:

- organization and staffing for the facility,
- qualifications of recently appointed personnel,
- administrative controls,
- the reactor console logs, and
- the annual reports.

2. Observations and Findings

The licensee's current operational organization consisted of the Radiation Center Director, a Reactor Administrator, Reactor Supervisor (a qualified Reactor Operator), three Reactor Operators, Scientific Instrument Technician (also qualified as a Reactor Operator), Senior Health Physicist, Health Physicist, and a Radiation Protection Technologist. This organization was consistent with that specified in the TS.

It was noted that the Radiation Center Director position was recently vacated and the former Chairman of the Reactor Operations Committee had been nominated and approved to fill that position. The position of Reactor Administrator also recently had been vacated and another individual selected to fill that position. A review of the qualifications of these two newly appointed individuals demonstrated that they were qualified in accordance with the American National Standard ANSI/ANS-15.4-1988 as required by the TS.

The Reactor Supervisor 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 reactor console logs showed that they were being maintained as required and problems, if any, were being documented. The annual reports summarized the required information and were issued at the frequency specified in the TS.

3. Conclusions

Staffing, reporting, and record keeping met the requirements specified in TS Section 6.

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, the inspector reviewed:

- Reactor Operations Committee meeting minutes,
- audits and reviews, and
- engineering changes under 10 CFR 50.59.

2. Observations and Findings

Minutes of the Reactor Operations Committee (ROC) showed that the committee met at the required frequency and that a quorum was present. The topics considered during the meetings were appropriate and as stipulated in TS Section 6.2. The ROC conducted audits and reviews as required. Problems noted during audits were discussed with the licensee and recommendations for improvement were made. The licensee implemented the improvements as necessary.

As noted above, the former Chairman of the ROC had recently been selected to become the Director of the Radiation Center. The inspector determined that the person who was chosen to become the new Chairman was well qualified for the position because the new Chairman was the former Reactor Administrator.

Through review of applicable records and interviews with licensee personnel, the inspector determined that all changes that had been initiated and/or completed at the facility since the last NRC operations inspection had undergone a review by the licensee staff who then wrote proposals outlining the changes. These were presented to the ROC for review and approval in accordance with procedure. It was noted that none of the changes were determined to constitute an unreviewed safety question.

3. Conclusions

Review and oversight functions required by TS Section 6.2 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 records, and
- medical examination records.

2. Observations and Findings

The licensee currently has four qualified senior reactor operators (SROs) and two reactor operators (ROs). All licenses were current and the earliest that any was scheduled to expire is in February of the year 2000. It was noted that the person who recently assumed the position of Reactor Administrator is not a qualified operator but is currently in training to become one.

A review of the logs and records showed that training had been conducted in the areas outlined in 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 manipulations, other operations activities, and Reactor Supervisor activities were being maintained, as were records of the Annual Operations Tests.

Operators were receiving the required medical examinations at the frequency specified.

3. Conclusions

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

d. Procedures (IP 69001)1. Inspection Scope

To determine whether facility procedures met the requirements outlined in TS Section 6.5, the inspector reviewed:

- operating procedures,
- administrative procedures, and
- procedural reviews and updates.

2. Observations and Findings

Operating procedures were acceptable for the facility and the current staffing level and specified the responsibilities of the various members of the staff. The procedures were being reviewed annually and updated as needed. The operations that were observed during this inspection were completed in accordance with the applicable procedures.

3. Conclusions

Facility procedures and document reviews satisfied TS Section 6 requirements. Procedural compliance was acceptable.

e. Fuel Movement (IP 69001)1. Inspection Scope

In order to verify adherence to fuel handling and inspection requirements, the inspector reviewed:

- fuel handling procedures,
- fuel inspection procedures, and
- applicable logs and records.

2. Observations and Findings

The inspector determined that the licensee was maintaining the required records of the various fuel movements that were completed and verified that the movements were conducted in compliance with procedure. The reactor fuel was being inspected upon initial receipt and on an as-needed basis as allowed by TS Section 4.4. The procedures used were acceptable and the radiological controls established were adequate.

3. Conclusions

Reactor fuel movements were made and documented in accordance with procedure and the fuel was being inspected on an as-needed basis as allowed by TS Section 4.4.

f. Surveillance (IP 69001)

1. Inspection Scope

To determine that surveillances and Limiting Conditions for Operations (LCOs) verifications were being completed as required by TS Section 4.0, the inspector reviewed:

- selected surveillance procedures,
- selected surveillance data and records, and
- Limiting Conditions for Operations.

2. Observations and Findings

The inspector noted that selected monthly, quarterly, semiannual, and annual checks, tests, verifications, and/or calibrations for TS-required surveillances and LCOs verifications were completed as stipulated. The surveillances and LCOs verifications 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 LCOs confirmations 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:

- experiment review and approval by the ROC,
- 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 many 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 Chief Reactor Supervisor as required. The results of the experiments were documented in the reactor operations log book.

The inspector observed the removal of a set of experiment samples from the reactor. It was noted that licensee personnel followed procedure and established protocol. Engineering controls were used to limit exposure to radiation. Contamination controls were used effectively.

3. Conclusions

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

2. **Emergency Preparedness**

a. Changes to the Emergency Response Plan (IP 69001)

1. Inspection Scope

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

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

2. Observations and Findings

The licensee submitted a revised Emergency Response Plan to the NRC on January 15, 1996. The NRC reviewed the changes and found that they were acceptable to implement the requirements of 10 CFR Part 50, Appendix E. Only minor changes had been made to the plan in 1997. The licensee was currently preparing another revision to be submitted to the NRC in the near future. The inspector also noted that the plan was reviewed annually by the ROC as required by the TS.

3. Conclusions

The licensee's Emergency Response Plan was found to be acceptable by the NRC after the last major revision in 1996. Another revision is being prepared for submittal to the NRC in the near future.

b. Emergency Response Plan Implementing Procedures (IP 69001)

1. Inspection Scope

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

- the Emergency Response Plan and Implementing Procedures,
- ROC meeting minutes, and
- recent revisions and updates of the procedures.

2. Observations and Findings

The licensee had reviewed and revised the Implementing Procedures as required. The procedures were last updated in 1996 and were acceptable to implement the provisions stipulated in the E-Plan.

3. Conclusions

The Implementing Procedures were being updated as required 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 Response 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.

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 Response 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 in case a contaminated injured person required medical treatment. Communications capabilities with these agencies were acceptable and had been tested on a periodic basis.

3. Conclusions

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

e. Emergency Preparedness Exercises and Drills (IP 69001)

1. Inspection Scope

To determine that the licensee was conducting the exercises and drills as specified in the Emergency Response 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 drills had been conducted annually as required by the Emergency Response Plan. Critiques were generally held following the drills to discuss the positive and negative aspects of the exercise and to develop possible solutions to any problems identified. It was noted that no documentation of the drill held in 1997 was readily available. It had been documented very briefly in the Reactor Console Log but the actual scenario, drill notes, and critique of the drill were not available. The licensee stated that the former Reactor Administrator had stored

the material on the hard drive of his computer but was not able to retrieve it at the moment. It was also noted that the drill for 1998 had not yet been conducted. The licensee acknowledged the importance of conducting appropriate drills and that drills usually highlight areas for improvement. The licensee was informed that the issue of documenting the 1997 drill would be noted by the NRC as an Inspector Follow-up Item (IFI) and would be reviewed during a future inspection (IFI 50-243/98-202-01).

3. Conclusions

Annual drills were held but the documentation for the 1997 drill was not available and the 1998 drill had not been held to date. An Inspector Follow-up Item was established to review the results of the 1997 drill and verify that the appropriate degree of difficulty was included in the drill.

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 Response Plan, and
- training records.

2. Observations and Findings

With respect to Emergency Preparedness and Response training, the inspector noted that it was being completed and documented as required for licensee personnel. However, it was noted that specific off-site personnel were to be involved in and receive regular training at fixed intervals but the specific periodicity was not given. The last records of any training for off-site personnel was that conducted prior to the 1996 annual drill. The licensee intends to conduct this training prior to the 1998 drill. The licensee was informed that the issue of documenting training for off-site personnel concerning emergency preparedness would be noted by the NRC as an IFI and would be verified during a future inspection (IFI 50-243/98-202-02).

3. Conclusions

Documentation of emergency preparedness training for off-site personnel was identified as an Inspector Follow-up Item.

3. **Exit Interview**

The inspection scope and results were summarized on December 3, 1998, 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

S. Binney, Director, Radiation Center
A. Hall, Reactor Supervisor
J. Higginbotham, Chairman of Reactor Operations Committee
S. Reese, Reactor Administrator
S. Smith, Scientific Instrument Technician
G. Wachs, Senior Reactor Operator

INSPECTION PROCEDURE USED

IP 69001 Class II Non-Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-243/98-202-01	IFI	Review the results of the 1997 drill and verify that the appropriate degree of difficulty was included in the drill.
50-243/98-202-02	IFI	Review the issue of documenting training for off-site personnel concerning emergency preparedness.

Closed

None

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
IFI	Inspector Follow-up Item
IP	Inspection Procedure
LCO	Limiting Condition for Operations
Mw	Megawatt
NPR	Non-Power Reactor
NRC	Nuclear Regulatory Commission
OSU	Oregon State University
RO	Reactor operator
ROC	Reactor Operations Committee
SRO	Senior reactor operator
TS	Technical Specifications
TRTR	Test, Research, and Training Reactor

U.S. Nuclear Regulatory Commission

**INSPECTION FOLLOW-UP SYSTEM (IFS)
POWER REACTOR, FUEL FACILITY & VENDOR DATA ENTRY FORM
OPEN NEW ITEMS ONLY - (non escalated)**

Nuclear Reactor Regula JRF

SITE NAME: Oregon State University

REPORT NO.:	UNIT	DOCKET NO.:
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	2	

SUBMITTED BY: Craig Bassett DATE: _____
 REVIEWED BY: Sy Weiss DATE: _____

Report Transmittal Date: _____

Last Name: Bassett

Lead Responsible Inspector RITS Initials: A Q U

Responsible Org. Code: P D N D

ANY NEW ITEMS ?
 No - Stop here
 Yes - Continue

Item Seq. No.:	0 1	Item Type:	I F I	Severity Level:	4	EA NO.				
ITEM STATUS:	Unit 1: 0	Unit 2:	Unit 3:	(fill in the EA NO. if opening an 'FEI' item. The EA NO. can be obtained from EICS)						

Title: Review the results of the 1997 emergency response drill.

(110 Characters Max)

Inspection Procedure Number:	SALP Functional Area:	Cause Code:	Closeout Org. Code:
69001	PS	30 , 31	P D N D

NOV Summary/Comments: The drill for 1997 had been conducted but the scenario, drill notes, and critique of the drill were not available. The former Reactor Administrator had the material stored on his hard drive but was unable to access it during the inspection. The results of the 1997 drill needs to be reviewed to verify that the appropriate degree of difficulty was included in the drill.

* NOTE: See back for CODES

Item Seq. No.:	0 2	Item Type:	I F I	Severity Level:		Supplement No.:	4	EA NO.	
ITEM STATUS:	Unit 1: 0	Unit 2:	Unit 3:	(Fill in the EA NO. if opening an 'EEI' item. The EA NO. can be obtained from EICS)					

Title: Review the issue of documenting the training for off-site personnel in the area of emergency response. _____ (110 Characters Max)

Inspection Procedure Number:	SALP Functional Area:	Cause Code:	Closeout Org. Code:
69001	PS	30 31	P D N D

NOV Summary/Comments: According to the Emergency Response Plan, specific off-site personnel were to be involved in and receive regular training at fixed intervals but the specific periodicity was not given. No records of any training for off-site personnel were available except for training that had been conducted prior to the 1996 annual drill. The documentation of training provided to off-site personnel for more recent drills needs to be reviewed to verify its adequacy.

Item Seq. No.:		Item Type:		Severity Level:		Supplement No.:		EA NO.	
ITEM STATUS:	Unit 1:	Unit 2:	Unit 3:	(Fill in the EA NO. if opening an 'EEI' item. The EA NO. can be obtained from EICS)					

Title: _____ (110 Characters Max)

Inspection Procedure Number:	SALP Functional Area:	Cause Code:	Closeout Org. Code:

NOV Summary/Comments: _____

U.S. Nuclear Regulatory Commission

INSPECTION FOLLOW-UP SYSTEM (IFS)
 POWER REACTOR, FUEL FACILITY & VENDOR DATA ENTRY FORM
 OPEN NEW ITEMS ONLY - (non escalated)

Nuclear Reactor Regulation

ITE NAME: Oregon State University

SUBMITTED BY: Craig Bassett DATE: _____

REVIEWED BY: Sy Weiss DATE: _____

REPORT NO.:						UNIT	DOCKET NO.:						
9	8	-	2	0	3	1	5	0	-	0	2	4	3
						2							

Report Transmittal Date:	Lead Responsible Inspector Last Name: <u>Bassett</u> RITS Initials: <u>A O U</u>	Responsible Org. Code: <u>P D N D</u>	ANY NEW ITEMS? No - Stop here Yes - Continue
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Item Seq. No.: <u>0 1</u>	Item Type: <u>I F I</u>	Severity Level:	Supplement No.: <u>4</u>	EA NO. _____
ITEM STATUS: <u>O</u>	Unit 1:	Unit 2:	Unit 3:	(Fill in the EA NO. if opening an 'EEI' item. The EA NO. can be obtained from EICS)

Title: Review the results of the 1997 emergency response drill.

 (110 Characters Max)

Inspection Procedure Number: <u>69001</u>	SALP Functional Area: <u>PS</u>	Cause Code: <u>30 31</u>	Closeout Org. Code: <u>P D N D</u>
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NOV Summary/Comments: The drill for 1997 had been conducted but the scenario, drill notes, and critique of the drill were not available. The former Reactor Administrator had the material stored on his hard drive but was unable to access it during the inspection. The results of the 1997 drill needs to be reviewed to verify that the appropriate degree of difficulty was included in the drill.

* NOTE: See back for CODES

Item Seq. No.:	0 2	Item Type:	I F I	Severity Level:		Supplement No.:	4	EA NO.	-
ITEM STATUS:	Unit 1: 0	Unit 2:	Unit 3:	(Fill in the EA NO. if opening an 'EEI' item. The EA NO. can be obtained from EICS)					

Title: Review the issue of documenting the training for off-site personnel in the area of emergency response.

(110 Characters Max)

Inspection Procedure Number:	69021	SALP Functional Area:	PS	Cause Code:	30 31	Closeout Org. Code:	P D N D
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NOV Summary/Comments: According to the Emergency Response Plan, specific off-site personnel were to be involved in and receive regular training at fixed intervals but the specific periodicity was not given. No records of any training for off-site personnel were available except for training that had been conducted prior to the 1996 annual drill. The documentation of training provided to off-site personnel for more recent drills needs to be reviewed to verify its adequacy.

Item Seq. No.:		Item Type:		Severity Level:		Supplement No.:		EA NO.	
ITEM STATUS:	Unit 1:	Unit 2:	Unit 3:	(Fill in the EA NO. if opening an 'EEI' item. The EA NO. can be obtained from EICS)					

Title:

(110 Characters Max)

Inspection Procedure Number:		SALP Functional Area:		Cause Code:		Closeout Org. Code:	
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NOV Summary/Comments: