

May 31, 2001

Mr. R. J. Cashwell, Director
University of Wisconsin Nuclear Reactor Laboratory
Room 141 Mechanical Engineering
1513 University Avenue
Madison, WI 53706-1687

SUBJECT: NRC INSPECTION REPORT NO. 50-156/2001-201

Dear Mr. Cashwell:

This letter refers to the inspection conducted on May 14-17, 2001, at your University of Wisconsin Nuclear Reactor Laboratory. 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 significant safety issues were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

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

Sincerely,

/RA/

Ledyard B. Marsh, Chief
Events Assessment, Generic Communications
and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-156
License No. R-74

Enclosure: NRC Inspection Report

cc w/encl:
Please see next page

University of Wisconsin

Docket No. 50-156

cc:

University of Wisconsin
ATTN: Ronald R. Bresell
Radiation Safety Officer
Safety Department
30 No. Murray Street
Madison, WI 53715

Mayor of Madison
City Hall
Madison, WI 53705

Chairman, Public Service
Commission of Wisconsin
Hill Farms State Office Building
Madison, WI 53702

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

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U. S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-156

License No: R-74

Report No: 50-156/2001-201

Licensee: University of Wisconsin

Facility: University of Wisconsin Nuclear Reactor Laboratory

Location: Madison, WI

Dates: May 14-17, 2001

Inspector: Craig Bassett

Approved by: Ledyard B. Marsh, Chief
Events Assessment, Generic Communications and
Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

University of Wisconsin
Report No: 50-156/2001-201

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 and record keeping met the requirements specified in the facility Technical Specifications (TS).
- ! Review and oversight functions required by TS Section 6.2 were acceptably completed by the Reactor Safety Committee. No changes had been made at the facility since the last operations inspection.
- ! 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 6.5 requirements. Procedural compliance was acceptable.
- ! Reactor fuel movements and inspections were made and documented in accordance with procedure and the fuel elements were being inspected annually as specified by TS Section 4.3.
- ! The program for surveillance and Limiting Conditions of Operation confirmations and verification was being implemented in accordance with TS requirements.
- ! Reactor operations were conducted in accordance with TS requirements and applicable procedures. The maintenance program satisfied NRC requirements.
- ! The program for the control of experiments satisfied regulatory requirements and license commitments.

Emergency Preparedness

- ! The Emergency Plan and Implementing Procedures were being reviewed annually and updated as needed and were appropriate for the size of and current operations at the facility.
- ! Emergency response facilities and equipment were generally being maintained as required and responders were knowledgeable of proper actions to take in case of an emergency.

- ! Off-site support was acceptable as were communications capabilities.
- ! Semi-annual drills and/or emergency procedure reviews were being conducted and critiques were written as required by the Emergency Plan.
- ! Emergency preparedness training for staff personnel was being completed as required.

REPORT DETAILS

Summary of Plant Status

The licensee's one megawatt (1 MW) TRIGA conversion non-power reactor (NPR) continued normal, routine operations. A review of the applicable records indicated that the reactor was typically operated in support of laboratory experiments, reactor system testing, reactor maintenance and surveillance, and operator training. During this inspection, the reactor was operated on two separate days at various power levels up to 1 MW for physics experiments and to support research and training.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure 69001)

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

- ! organizational structure of the facility
- ! administrative controls and management responsibilities
- ! selected Operations Logs

b. Observations and Findings

Through discussions with licensee representatives, the inspector determined that management responsibilities and the organization at the University of Wisconsin Nuclear Reactor (UWNR) Laboratory had not changed since the previous NRC inspection in May 2000 (Inspection Report No. 50-156/2000-201). The Reactor Supervisor retained direct control and overall responsibility for safe operation and maintenance of the facility as specified in the TS. The Reactor Supervisor reported to the Chancellor of University of Wisconsin-Madison through the Reactor Director and the Dean of Engineering.

The licensee's current operational organization consisted of the Reactor Director, the Associate Reactor Director, a Reactor Supervisor, and one other person. All of these individuals are qualified Senior Reactor Operators (SROs). In addition, there is one student SRO and five student Reactor Operators (ROs). The Reactor Director, the Associate Reactor Director, the Reactor Supervisor, and one SRO are full-time positions while all the others are part-time. This organization was consistent with that specified in the TS.

A review of the reactor console logs showed that they were being maintained as required and staffing during reactor operations was acceptable.

c. Conclusions

Staffing and record keeping met the requirements specified in the TS.

2. Review, Audit, and Design Change Functions

a. Inspection Scope (Inspection Procedure 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 Section 6.2, the inspector reviewed:

- ! Reactor Safety Committee meeting minutes
- ! completed audits and reviews
- ! procedures requiring review of changes under 10 CFR 50.59

b. Observations and Findings

The inspector reviewed the Reactor Safety Committee's (RSC's) meeting minutes from December 1997 to the present. These meeting minutes showed that the RSC had met at the required frequency and had considered the types of topics outlined by the TS.

The inspector noted the RSC reviewed audits conducted of the facility operations, programs, and procedures. Since the last NRC inspection, audits had been completed by personnel from the University Radiation Safety Committee as provided for by the TS. The audits were structured so that the various aspects of the licensee's operations and safety programs were reviewed on a monthly basis. Major facility documents and plans were generally reviewed annually, as were the facility procedures. The inspector noted that the audits and the resulting findings were documented and that the licensee responded and took corrective actions to any findings as needed.

Through review of applicable records and interviews with licensee personnel, the inspector determined that no changes had been initiated and/or completed at the facility since the last NRC operations inspection. However, the inspector verified that procedures were in place that required the appropriate review and approval of all changes prior to implementation.

c. Conclusions

Review and oversight functions required by TS Section 6.2 were acceptably completed by the RSC. No changes had been made at the facility since the last operations inspection.

3. Operator Licenses, Requalification, and Medical Activities

a. Inspection Scope (Inspection Procedure 69001)

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 and performance evaluations
- ! training records
- ! medical examination records

b. Observations and Findings

As noted above, there are currently five qualified SROs at the facility and five ROs. It was noted that two of the ROs are currently in an inactive status. Seven people are in training and will take the NRC operator examination shortly. All of the operators' licenses were current.

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

c. Conclusions

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

4. Procedures and Procedural Compliance

a. Inspection Scope (Inspection Procedure 69001)

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

- ! selected operating procedures
- ! selected operating and administrative logs
- ! selected forms and checklists
- ! procedural reviews and updates

b. Observations and Findings

The licensee's procedures and checklists were found to be acceptable for the current facility status, staffing, and operations level. The inspector noted that procedure UWNR 001, "Standing Operating Instructions," specified the responsibilities of the various members of the staff and the role of procedures at the facility. The procedures were being audited/reviewed annually, as noted earlier, and were updated as needed. It was also determined that substantive revisions to checklists and forms were routinely presented to the RSC for review

and approval as required by TS. The inspector verified that the latest revisions to selected procedures and forms 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 checklists and procedures.

c. Conclusions

Facility procedures satisfied TS Section 6.5 requirements and document reviews were being completed annually. Procedural compliance was acceptable.

5. Fuel Movement

a. Inspection Scope (Inspection Procedure 69001)

In order to verify adherence to fuel handling and inspection requirements specified in TS Section 4.3, the inspector reviewed:

- ! fuel handling procedures
- ! UWNR 169, "Annual Maintenance Procedure"
- ! selected operations logs and records

b. 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 and recorded in compliance with procedure. The inspector noted that the latest core configuration, I23-R10, had not been changed for several years.

The inspector verified that the reactor fuel was being inspected annually as required by TS. The procedures and the controls specified for these operations were acceptable.

c. 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 4.3.

6. Surveillance Activities

a. Inspection Scope (Inspection Procedure 69001)

To determine that surveillance and Limiting Conditions of Operation activities and verifications were being completed as required by TS Sections 3 & 4, the inspector reviewed:

- ! selected surveillance procedures
- ! selected surveillance data sheets, records, and tests
- ! selected surveillance forms - UWNR 100, "Surveillance Activities"
- ! calibration procedures and records
- ! pre-startup, startup and shutdown log sheets
- ! operations log sheets

b. Observations and Findings

The inspector determined that selected daily, monthly, semiannual, and annual checks, tests, and verifications for TS-required Limiting Conditions of Operation (LCOs) and surveillance activities were completed as stipulated. Surveillance and LCO verifications reviewed were 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 complete and were being maintained as required.

c. Conclusions

The program for surveillance and LCO verifications was being carried out in accordance with TS requirements.

7. Operations and Maintenance

a. Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- ! selected operations log sheets
- ! surveillance forms - UWNR 100, "Surveillance Activities"
- ! maintenance procedures
- ! preventive maintenance records

b. Observations and Findings

A review of operations logs and records indicated that staffing during reactor operations was acceptable and consistent with TS requirements. Operations were conducted in accordance with applicable procedures.

Logs indicated that preventive maintenance activities were conducted as

scheduled and any problems found were addressed in accordance with the Technical Specifications, applicable procedures, or equipment manuals. Maintenance activities ensured that equipment condition remained consistent with the Safety Analysis Report and Technical Specification requirements. Further, maintenance activities were consistent with the requirements of 10 CFR 50.59.

c. Conclusions

Reactor operations were conducted in accordance with TS requirements and applicable procedures. The maintenance program satisfied NRC requirements.

8. Experiments

a. Inspection Scope (Inspection Procedure 69001)

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

- ! selected experiment forms - UWNR 030, "Experiment Review Questionnaires"
- ! selected request forms - UWNR 130, "Request for Isotope Production"
- ! selected authorization forms - UWNR 134, "Request and Authorization for Services of the University of Wisconsin Reactor"
- ! potential hazards identification
- ! control of irradiated items

b. Observations and Findings

The inspector noted that the experiments currently being conducted at the facility were those classified as routine or modified routine. These experiments had been reviewed and approved by the Reactor Director as required and were conducted under the cognizance of a SRO or the Reactor Supervisor. The results of the experiments were documented on the Operations Log book sheets and on the irradiation request forms (UWNR 130).

No new or special experiments had been initiated, reviewed, or approved since the last inspection. It was noted that the TS and the applicable procedural guidance required the RSC to review and approve any experiment classified as special. Licensee representatives said that this was the process that has been and would continue to be followed.

c. Conclusions

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

9. Emergency Preparedness

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- ! the emergency plan - UWNR 006, "University of Wisconsin Nuclear Reactor Emergency Plan and implementing procedures
- ! emergency response supplies, equipment, and instrumentation
- ! training records
- ! offsite support
- ! emergency drills and critiques

b. Observations and Findings

The emergency plan in use at the UWNR Laboratory was the facility procedure, UWNR 006, "University of Wisconsin Nuclear Reactor Emergency Plan." The Emergency Plan (E-Plan) was audited and reviewed annually as required. Implementing procedures were also reviewed and revised annually as needed. 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. One agreement with an off-site response organization (the University Hospital) was maintained. Other agreements were not needed because the fire department and police force was required to respond to the licensee's facility by state law. Communications capabilities with these support groups were acceptable. Emergency drills and review of implementing procedures had been conducted semi-annually as required by the E-Plan. Critiques were written following the drills to identify any strengths and weaknesses noted during the exercise and to develop possible solutions to any problems identified. The results of these critiques were documented and filed. Training for reactor staff personnel was conducted and documented as required.

c. Conclusions

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

10. Exit Meeting Summary

The inspection scope and results were summarized on May 17, 2001, with licensee representatives. The inspector discussed the findings for each area reviewed. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector during this inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Agasie, Associate Reactor Director
R. Cashwell, Reactor Director
A. Smolinsky, Senior Reactor Operator

Other Personnel

M. Dirienzo, Chief, Fire Station 4, Madison City Fire Department
D. Peterson, Lieutenant, Fire Station 4, Madison City Fire Department

INSPECTION PROCEDURES USED

IP 69001 Class II Non-Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
E-Plan	Emergency Plan
IP	Inspection Procedure
LCO	Limiting Conditions of Operation
MW	Megawatt
NPR	Non-Power Reactor
NRC	Nuclear Regulatory Commission
RO	Reactor Operator
RSC	Reactor Safety Committee
SRO	Senior Reactor Operator
TS	Technical Specifications
UWNR	University of Wisconsin Nuclear Reactor