

June 9, 2000

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. 50-156/00-201

Dear Mr. Cashwell:

This letter refers to the inspection conducted on May 15-18, 2000, 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 safety significant 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  
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Test, Research and Training  
Reactor Newsletter  
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U. S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-156

License No: R-74

Report No: 50-156/00-201

Licensee: University of Wisconsin

Facility: University of Wisconsin Nuclear Reactor Laboratory

Location: Madison, WI

Dates: May 15-18, 2000

Inspector: C. H. 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: 50-156/00-201

This routine, announced inspection included onsite review of selected aspects of various licensee programs including: organization and staffing, review and audit, radiation controls, transportation of radioactive materials, physical security, and material control and accountability since the last NRC inspection of this TRIGA conversion research reactor.

### Organization and Staffing

- The licensee's organization and staffing remain in compliance with the requirements specified in the Technical Specifications.

### Review and Audit Functions

- Audits were being conducted by the Reactor Safety Committee in compliance with the requirements specified in the Technical Specifications.

### Radiation Control

- Surveys were being completed and documented acceptably.
- Postings met the regulatory requirements.
- Personnel dosimetry was being worn as required and doses were well within the licensee's procedural action levels, and NRC's regulatory limits.
- Radiation monitoring equipment was being maintained and calibrated as required.
- The Radiation Protection and ALARA Programs satisfied regulatory requirements.
- There were no measurable releases of radioactive effluents from the facility.

### Transportation of Radioactive Materials

- Radioactive material was shipped from the reactor facility in accordance with Department of Transportation and NRC requirements.

### Physical Security

- The licensee had implemented and was maintaining an adequate physical security program.

### Material Control and Accountability

- No deficiencies were identified in the licensee's Material Control and Accounting program.

## REPORT DETAILS

### **Summary of Plant Status**

During this inspection, the licensee's non-power reactor (NPR) was operated two days at various power levels up to one megawatt (1 MW) for physics experiments and to support research and training.

#### **1. Organization and Staffing (69001)**

##### a. Inspection Scope

The inspector reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of the Technical Specification (TS) were being met:

- organizational structure
- management responsibilities
- staffing requirements for the research reactor facility

##### b. Observations and Findings

Through discussions with licensee representatives, the inspector determined that management responsibilities and the organization at the facility had not changed since the previous NRC inspection in January 1999 (Inspection Report No. 50-156/99-201). It was noted that the position of Associate Director had been filled by an individual who had formerly worked at the facility.

Through review of records and logs and through discussions with licensee personnel, the inspector determined that the staffing at the facility was acceptable to support the current workload and ongoing activities. The staffing met the requirements of the TS.

##### c. Conclusions

The licensee's organization and staffing remain in compliance with the requirements specified in the TS.

#### **2. Review and Audit Functions (69001)**

##### a. Inspection Scope

The inspector reviewed the following to ensure that the audits and reviews stipulated in the requirements of the TS were being completed:

- Reactor Safety Committee (RSC) meeting minutes
- TS duties specified for the RSC including review and audit functions
- Audits completed by the RSC

b. Observations and Findings

The inspector reviewed the RSC's meeting minutes from January 1998 to the present. These meeting minutes showed that each committee met as required by the TS with a quorum being present. The inspector also noted that the RSC had considered the types of topics outlined by the TS.

It was noted that RSC members and personnel from the Campus Safety Department completed audits of the radiation protection and security programs and that the audits were generally completed within the time frame stipulated by TS. The inspector noted that the audits and the resulting findings were acceptable. If the findings contained recommendations for possible changes, the licensee responded and took corrective actions as necessary.

c. Conclusions

Audits were being completed according to the requirements specified in the TS.

**3. Radiation Control (69001)**

a. Inspection Scope

The inspector reviewed the following to verify compliance with 10 CFR Part 20 and the applicable licensee TS requirements and procedures:

- health physics survey records
- radiological signs and posting
- dosimetry records
- calibration and periodic check records for radiation monitoring instruments
- the Radiation Protection Program
- the ALARA Program
- the 1998 and 1999 Annual Reports

The inspector also toured the licensee's facility and observed the use of dosimetry and radiation monitoring equipment. Licensee personnel were interviewed as well.

b. Observations and Findings

(1) Surveys

The various periodic contamination and radiation surveys were completed by reactor staff and by the Safety Department staff as required by TS and procedure. Results were evaluated to ensure that the survey results had not exceeded established action levels.

(2) Postings and Notices

Postings at the entrances to the controlled areas, including the Reactor Room, were acceptable for the hazards present. The facility's radioactive material

storage areas were properly posted. No unmarked radioactive material was noted. Copies of current notices to workers required by 10 CFR Part 19, including NRC Form-3, were posted in appropriate areas in the facility.

(3) Dosimetry

The licensee used a National Voluntary Laboratory Accreditation Program (NVLAP) accredited vendor to process personnel dosimetry. Examination of the records for the past two years through the date of the inspection showed that all exposures were well within NRC limits and the licensee action levels. Dosimetry was acceptably used by facility personnel.

(4) Radiation Monitoring Equipment

The calibration of portable survey meters was typically completed by reactor staff personnel. A few instruments were taken to the facility operated by the Safety Department for calibration on the upper scales. Calibration frequency met TS requirements and records were maintained as required.

(5) Environmental Protection

Environmental samples were collected, prepared, and analyzed consistently with the TS requirements. Laboratory equipment was maintained and calibrated acceptably. Data indicated that there were no measurable dose above background. This was acceptably documented in the Annual Reports. Observation of the facility found no new potential release paths.

The program for the monitoring and storage of radioactive liquid, gases, and solids was consistent with applicable regulatory requirements. Radioactive material was monitored and released when below acceptable limits or was acceptably transferred to the broad-scope license for disposition. The principles of As Low As Reasonably Achievable were acceptably implemented to minimize radioactive releases. Monitoring equipment was acceptably maintained and calibrated. Records were current and acceptably maintained.

(6) Radiation Protection Program

The licensee's Radiation Protection Program was established in the University of Wisconsin Radiation Safety Regulations Manual, Revision (Rev) 2, dated January 1997. The program included requirements that all personnel who had unescorted access to the facility receive training in radiation protection, policies, procedures, requirements, and facilities. Completion of this training was verified by reactor staff and by Safety Department personnel. The program appeared to be acceptable and was being reviewed annually as required.

(7) ALARA Program

The ALARA Program was also outlined and established in the University of Wisconsin Radiation Safety Regulations Manual. The ALARA program provided

guidance for keeping doses as low as reasonably achievable and was consistent with the guidance in 10 CFR 20.

(8) Facility Tours

The inspector toured the Control Room, reactor bay, selected laboratories, and support areas. Control of radioactive material and control of access to radiation areas were acceptable. The inspector also conducted an independent radiation survey in various areas of the facility and determined that radiation levels recorded on licensee survey maps were representative and accurate.

c. Conclusions

Surveys were being completed and documented acceptably. Postings met regulatory requirements. Personnel dosimetry was being worn as required and doses were well within the licensee's procedural action levels and the NRC's regulatory limits. Radiation monitoring equipment was being maintained and calibrated as required. The environmental protection program satisfied NRC requirements. The Radiation Protection Program and the ALARA Program satisfied regulatory requirements as well.

**4. Transportation (86740)**

a. Inspection Scope

The inspector interviewed licensee personnel and reviewed various records to verify compliance with procedural requirements for transferring licensed material.

b. Observations and Findings

Records showed that the radioactive material for disposal was transferred to the broad scope license in accordance with licensee requirements. This program for radioactive material transport is consistent with license requirements.

The transport of radiological samples was also reviewed. Records showed that the radioisotope type and quantities were calculated and dose rates were measured. These records also showed that transportation of the radioactive materials was being completed in accordance with Department of Transportation (DOT) and NRC requirements.

c. Conclusions

Radioactive material was shipped from the reactor facility in accordance with DOT and NRC requirements.

**5. Physical Safeguards and Security (81401, 81402, 81431)**

a. Inspection Scope

The inspector reviewed the licensee's physical safeguards and security program to determine compliance with the requirements in the facility operating license and 10 CFR 50.54(p).

b. Observations and Findings

The inspector reviewed the implementation of the licensee's Physical Security Plan, Rev 3, dated May 24, 1991. The site and facilities were verified to be as described in the Physical Security Plan. Keys to access doors were held and controlled only by designated personnel. The facility was patrolled by University Division of Police and Security personnel as required. It was verified that there had been no safeguards events since the last inspection. The inspector visited the University Police Department and, through discussions, determined that police and security personnel were well acquainted with the reactor facility and appropriately trained.

c. Conclusion

The licensee had implemented and was maintaining an adequate physical security program.

**6. Material Control and Accounting (85102)**

a. Inspection Scope

To verify compliance with 10 CFR 70, the inspector reviewed:

- control of storage areas
- annual inventory results of Special Nuclear Material (SNM)
- associated records and reports

b. Observations and Findings

Records showed that SNM was adequately controlled and that physical inventories were conducted at least annually as required by 10 CFR 70.51(d). Nuclear Material Transaction Reports (DOE/NRC Form 741) and Material Status Reports (DOE/NRC Form 742) were being submitted by the licensee as required by 10 CFR 74.13(a)(1).

c. Conclusion

No deficiencies were identified in the licensee's Material Control and Accounting program.

**7. Follow-up on Previously Identified Items (92701, 92702)**

a. Inspection Scope

The inspector reviewed the licensee's actions taken in response to previously identified Inspector Follow-up Items.

b. Observation and Findings

- (1) (Closed) VIO 50-156/96-01-01 - Failure to Perform Required Monthly Radiation Protection Audits as required by TS. During this inspection the inspector reviewed the licensee's response to the violation dated October 2, 1996, and verified that the corrective actions outlined by the licensee had been completed. This item is considered closed.
- (2) (Closed) IFI 50-156/96-01-02 - Review Annual Audits of the Reactor Radiation Protection Program. It had been noted that the 1995 Annual Audit had not been detailed or comprehensive enough to be substantive. During this inspection, the inspector reviewed recent annual audits and found them to be substantive and acceptable. This item is considered closed.
- (3) (Closed) IFI 50-156/96-01-03 - Annual Surveillance of Reactor Fume Hoods. The Safety Department had not been completing fume hood air flow tests as required by procedure. During this inspection, the inspector verified that the fume hood air flow tests had been completed annually since 1997 to date. This item is considered closed.
- (4) (Closed) IFI 50-156/96-01-04 - Review the University ALARA Program to Ensure that the Reactor Facility is included. The inspector determined that the University ALARA Program currently includes the Reactor Facility and that ALARA reviews are held to ensure that doses remain low and within allowable limits. This item is considered closed.
- (5) (Closed) VIO 50-156/99-201-02 - Failure to Ship Radioactive Material in Accordance with 10 CFR 71.5 and applicable DOT requirements. The inspector reviewed the licensee's response to this problem dated March 5, 1999, and verified that corrective actions had been completed as stipulated. This item is considered closed.

c. Conclusions

IFI's and VIO are closed.

**8. Exit Meeting Summary**

The inspection scope and results were summarized on May 18, 2000, 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  
S. Matusewic, Reactor Supervisor  
J. Murphy, Senior Reactor Operator

Safety Department

A. Ben-Zikri, Alternate Radiation Safety Officer/Advanced Health Physicist  
L. DeKock, Senior Health Physicist

University Police

L. Krieg, Police Communications Supervisor  
T. Kuschel, Lieutenant

INSPECTION PROCEDURES USED

IP 69001: Class II Non-Power Reactors  
IP 81401: Plans, Procedures, and Reviews  
IP 81402: Reports of Safeguards Events  
IP 81431: Fixed Site Physical Protection of Special Nuclear Material of Low Strategic Significance  
IP 85102: Material Control and Accounting - Reactors  
IP 86740: Inspection of Transportation Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

50-156/96-01-01	VIO	Failure to Perform Required Monthly Radiation Protection Audits as required by TS.
50-156/96-01-02	IFI	Review Annual Audits of the Reactor Radiation Protection Program.
50-156/96-01-03	IFI	Annual Surveillance of Reactor Fume Hoods.

50-156/96-01-04	IFI	Review the University ALARA Program to Ensure that the Reactor Facility is Included.
50-156/99-201-02	VIO	Failure to Ship Radioactive Material in Accordance with 10 CFR 71.5 and applicable DOT requirements.

LIST OF ACRONYMS USED

ALARA	As low as reasonably achievable
CFR	Code of Federal Regulations
DOT	Department of Transportation
IFI	Inspector Follow-up Item
IP	Inspection Procedure
HP	Health physics
MW	Megawatt
NPR	Non-Power Reactor
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
RSC	Reactor Safety Committee
SNM	Special Nuclear Material
TS	Technical Specifications
VIO	Violation