

June 24, 2015

Mr. R. J. Agasie, Reactor Director  
Nuclear Reactor Laboratory  
University of Wisconsin - Madison  
1513 University Avenue, Room 1215  
Madison, WI 53706-1687

SUBJECT: UNIVERSITY OF WISCONSIN – NRC ROUTINE INSPECTION REPORT  
NO. 50-156/2015-201

Dear Mr. Agasie:

From June 8–11, 2015, the U.S. Nuclear Regulatory Commission (NRC, the Commission) completed an inspection at your University of Wisconsin Nuclear Reactor Laboratory. The enclosed report documents the inspection results, which were discussed on June 11, 2015, with you and members of your staff.

This 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 observed various activities in progress, interviewed personnel, and reviewed selected procedures and representative records. 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).

R. J. Agasie

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Should you have any questions concerning this inspection, please contact Craig Bassett at 301-466-4495 or by electronic mail at [Craig.Bassett@nrc.gov](mailto:Craig.Bassett@nrc.gov).

Sincerely,

**/RA by MDeSouza for/**

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

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

Enclosure:  
NRC Inspection Report No. 50-156/2015-201

cc: See next page

University of Wisconsin

Docket No. 50-156

cc:

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R. J. Agasie

- 2 -

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|        |               |                       |
|--------|---------------|-----------------------|
| OFFICE | NRR/DPR/PROB* | NRR/DPR/PROB          |
| NAME   | CBassett      | KHsueh (MDeSouza for) |
| DATE   | 06/24/2015    | 06/24/2015            |

**OFFICIAL RECORD COPY**

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

License No: R-74

Report No: 50-156/2015-201

Licensee: University of Wisconsin

Facility: Nuclear Reactor Laboratory

Location: Madison, WI

Dates: June 8-11, 2015

Inspector: Craig Bassett

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

## EXECUTIVE SUMMARY

University of Wisconsin - Madison  
Nuclear Reactor Laboratory  
Report No: 50-156/2015-201

The primary focus of this routine, announced inspection was the on-site review of selected aspects of the University of Wisconsin (the licensee's) Class II research and test reactor safety program including: 1) organization and staffing, 2) review and audit and design change functions, 3) reactor operations, 4) operator requalification, 5) procedures, 6) fuel handling, 7) maintenance and surveillance, 8) experiments, and 9) emergency preparedness since the last U.S. Nuclear Regulatory Commission (NRC) inspection of these areas. The licensee's program was acceptably directed toward the protection of public health and safety and in compliance with NRC requirements. No violations or deviations were identified.

### Organizational Structure and Staffing

- The organizational structure was consistent with Technical Specifications requirements.
- Shift staffing met the requirements for duty, relief, and on-call personnel.

### Review and Audit and Design Change Functions

- The review and audit functions required by Technical Specifications Section 6.2 were being acceptably completed by the Reactor Safety Committee.
- The 50.59 design change process at the facility was being followed as required and no recent changes required NRC approval.

### Reactor Operations

- Reactor operations were conducted in accordance with Technical Specifications requirements and applicable procedures.

### Operator Licenses, Requalification, and Medical Activities

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

### Procedures and Procedural Control

- Facility procedural review, revision, and control satisfied the requirements specified in Section 6.5 of the Technical Specifications.

### Fuel Handling

- Reactor fuel movements and inspections were completed and documented in accordance with procedure.
- The fuel was being inspected as specified by Technical Specifications Section 4.3 and the core was arranged as required in Technical Specifications Section 5.2.

#### Maintenance and Surveillance

- Maintenance logs and records were being kept and maintenance activities were being conducted in accordance with procedural requirements.
- The program for tracking and completing surveillance checks and Limiting Conditions for Operation verifications satisfied Technical Specifications requirements and licensee administrative and procedural controls.

#### Experiments

- Conduct and control of experiments and irradiations met the requirements specified in Technical Specifications Section 6.8, the applicable experiment and irradiation authorizations, and associated procedures.

#### Emergency Preparedness

- The Emergency Plan and Implementing Procedures were being reviewed annually as required and updated as needed.
- Emergency response facilities and equipment were being maintained as required.
- Emergency responders were knowledgeable of proper actions to take in case of an emergency.
- Off-site support was available and the various support organizations were staffed and well equipped.
- Semiannual drills were being conducted as required by the Emergency Plan.
- Emergency preparedness training for staff personnel was being completed as required.

## REPORT DETAILS

### Summary of Plant Status

The University of Wisconsin (UW or the licensee) continued to operate the one megawatt TRIGA conversion reactor as needed in support of laboratory and lecture courses, research in the area of neutron irradiation, and the Reactor Sharing Program. During this inspection the reactor was operated several hours per day on Monday and Wednesday, at varying power levels, for experiments and sample irradiations.

### 1. Organizational Structure and Staffing

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

To verify that the organization, responsibility, and staffing requirements specified in Section 6.1 of the facility Technical Specifications (TS) designated as Appendix A of the UW Nuclear Reactor renewed license, dated March 25, 2011, the inspector reviewed selected aspects of the following:

- Management responsibilities stipulated in the TS
- Staffing requirements for operation of the reactor facility
- Selected Startup Checklists for 2014 and to date in 2015
- Organizational structure for the Nuclear Reactor Laboratory
- Selected Operations Log Sheets, checklists, and associated forms and records for 2014 and to date in 2015
- University of Wisconsin Nuclear Reactor (UWNR) Procedure number (No.) 001, "Standing Operating Instructions," Revision (Rev.) 16
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2012 – 2013 Annual Operating Report," for the period from July 2012 through June 2013, submitted to the NRC on August 9, 2013
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2013 – 2014 Annual Operating Report," for the period from July 2013 through June 2014, submitted to the NRC on August xx, 2014

#### b. Observations and Findings

Through discussions with licensee representatives, it was noted that management responsibilities and the organization at the University of Wisconsin Nuclear Reactor Laboratory had not changed since the previous NRC inspection in May 2014 (Inspection Report No. 50-156/2014-201). The Reactor Director was responsible for all activities at the facility as stipulated in the TS. The Reactor Supervisor retained direct control and overall responsibility for safe operation and maintenance of the reactor. The Reactor Director reported to the Chancellor of University of Wisconsin-Madison through the Chair of the Engineering Physics Department as required.

The licensee's current operational organization consisted of a Reactor Director, a Reactor Supervisor, and two reactor operators. This organization was consistent with that specified in the TS.

A review of selected reactor Operating Log Sheets and the associated records for the past two years showed that the logs were being maintained as required. The logs and records confirmed that shift staffing met the requirements for duty, relief, and on-call personnel.

a. Conclusions

The licensee's organization and staffing met the requirements specified in the TS and applicable procedures.

**2. Review and Audit and Design Change Functions**

a. Inspection Scope (IP 69001)

In order to verify that the audits stipulated in TS Section 6.2.4 had been conducted by the Radiation Safety office and the Reactor Safety Committee (RSC), and that reviews required by TS Section 6.2.3 had been completed by the RSC, and to determine whether modifications to the facility were consistent with 10 CFR 50.59, the inspector reviewed:

- RSC meeting minutes from May 2013 through the present
- Selected Operations Log Sheets, checklists, and associated forms and records for 2014 and to date in 2015
- Records of design changes and/or modifications to the facility documented on forms entitled, "UWNR Modification Checklist," "Safety Screening," and "Safety Evaluation"
- Audits completed by Radiation Safety Office staff personnel documented in monthly reports submitted to the RSC entitled "Nuclear Reactor Audit and Report" for 2013, 2014, and to date in 2015
- Audits completed by operations staff personnel documented in monthly reports submitted to the RSC entitled "Monthly Operations Summary" for 2013, 2014, and to date in 2015
- Audits of the facility Requalification Plan, the Emergency Plan, and the Security plan completed by personnel from various organizations, including the UW Safety Department and the UW Police Department
- UWNR Procedure No. 005, "UWNR Administrative Guide," Rev. 59
- UWNR Procedure No. 019, "Changes, Tests, and Experiments," Rev. 2
- The two most recent Annual Operating Reports issued by the facility

b. Observations and Findings

(1) Review and Audits Functions

The inspector reviewed the RSC's meeting minutes from May 2013 to the present. These meeting minutes demonstrated that the RSC had met at the required frequency and that a quorum was present. The minutes also indicated that the RSC, or a designated subcommittee, was completing reviews of those items and documents required by the TS. Through

these reviews, the RSC was providing appropriate oversight and direction for reactor.

The inspector noted that various audits had been conducted of the facility in the areas of reactor operations, radiation protection, emergency preparedness, security, requalification of operators, and procedures. The inspector noted that the RSC reviewed these audits as required. The audits were structured so that the various aspects of the licensee's radiation protection and safety programs were reviewed on a monthly basis. Major facility documents and plans were reviewed annually, as were the facility procedures. The inspector noted that the audits and the resulting findings were adequately documented and that the licensee responded and took corrective actions to the findings as needed.

(2) Design Control Functions

Through review of applicable records and interviews with licensee personnel, the inspector determined that various modifications and design changes had been initiated at the facility since the last NRC operations inspection. The majority of the recent changes involved either procedure changes or replacing items of equipment with more modern versions.

The inspector verified that the licensee was following the established design change program and that the required reviews and approvals of the changes had been completed by the RSC, if required, prior to implementation. It was noted that the design change procedure had been revised to help licensee personnel determine whether or not a full safety evaluation was required when a change was proposed. The procedure incorporated screening criteria for this purpose. The licensee determined that one change that had been proposed to date met the criteria of 10 CFR 50.59(c)(2) paragraphs (i) through (viii) which would require a safety evaluation and/or NRC approval of the changes. It involved a proposed new experiment. The inspector verified that a safety evaluation had been completed for the new experiment and that the evaluation was reviewed and approved by the Reactor Director and the RSC as required.

c. Conclusions

Review and audit functions required by TS Section 6.2 were acceptably completed by the RSC. The 50.59 process for reviewing and approving design changes at the facility was being followed as required and no recent changes required NRC approval.

**3. Reactor Operations**

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to ensure that actions taken during routine operations or during abnormal occurrences were in compliance with TS Sections 6.6 and 6.7, and with the procedures specified in TS Section 6.4:

- UWNR Special Orders which were currently in effect
- UWNR Operators Turn-Over Log maintained on the computer in the Control Room
- Selected Operations Log Sheets, checklists, and associated forms and records for 2014 and to date in 2015
- Selected audits completed by Safety Department staff personnel documented in monthly reports for 2014 and to date in 2015
- Various reviews completed by operations staff personnel documented in monthly reports for 2014 and to date in 2015
- Various UWNR Procedures including Procedure No. 001, "Standing Operating Instructions," Rev. 16
- The two most recent Annual Operating Reports issued by the facility

b. Observations and Findings

The inspector reviewed selected Daily Reactor Pre-Startup Check Lists, Reactor Startup Check Sheets, Operating Log Sheets, and Reactor Shutdown Checklists from December 2013 through the date of this inspection. The forms were color coded to facilitate location of the recorded data and to ensure proper usage of the forms. Through this review, the inspector determined that reactor operations were carried out following written procedures as required by the TS. Any problems or abnormal events noted during operation, were documented in the operations log, reported, reviewed, and the problems resolved as required by TS and the procedures. Scrams were identified on specific forms in the logs and records, reported as required, and their cause(s) resolved before the resumption of operations under the authorization of a licensed SRO.

The inspector verified that the information that was required to be recorded by the TS and various procedures were logged on the appropriate forms and cross referenced with other logs and/or forms. The data indicated that no TS operational limits had been exceeded. The logs and records indicated that shift staffing was adequate and satisfied the requirements for duty and on-call personnel.

c. Conclusions

Reactor operations and other required actions were completed in accordance with TS requirements and applicable procedures.

**4. Operator Requalification**

a. Inspection Scope (IP 69001)

To determine that operator requalification activities and training were conducted in accordance with UWNR Procedure No. 004, "University of Wisconsin Nuclear Reactor Operator Proficiency Maintenance Program," Rev. 4, RSC approval dated May 28, 2015 (the licensee's operator requalification plan) and 10 CFR Part 55, and that medical requirements were met, the inspector reviewed:

- Active operators' license status
- Written examination records for 2013 and 2014
- Operator medical examination records from 2012 to the present
- Selected Operations Log Sheets, checklists, and associated forms and records for 2014 and to date in 2015
- Audits completed by operations staff personnel documented in monthly reports submitted to the RSC entitled "Monthly Operations Summary" for 2014 and to date in 2015
- 2013, 2014, and 2015 Training Status Record forms for selected individuals for the past three years
- UWNR Operator Evaluation Check Sheet records for the past three years
- UWNR Operator Proficiency Maintenance Program - Class Record Sheets for the past three years
- Various UWNR Procedures including Procedure No. 004, "University of Wisconsin Nuclear Reactor Operator Proficiency Maintenance Program," Rev. 4 and UWNR Procedure No. 005, "UWNR Administrative Guide," Rev. 59
- Logs and records of reactivity manipulations documented on forms associated with UWNR Procedure No. 112, "Operating Log Sheet," Rev. 10
- The two most recent Annual Operating Reports issued by the facility
- ANSI/ANS Standard 15.4, "Standards for Selection and Training of Personnel for Research Reactors," dated June 9, 1988

b. Observations and Findings

There were two full-time qualified SROs employed at the facility as well as two part-time student ROs. All of the operators' licenses were verified to be current. It was noted that there were no people in training to become qualified operators as of the date of the inspection but a class was scheduled to begin in the fall.

A review of facility logs and training records showed that training and 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. A review of the records of quarterly reactor operations, reactivity manipulations, other operations and supervisory activities, indicated that these required activities were being completed by each licensed operator. Records also indicated that quarterly performance evaluations were being completed as required. The inspector noted that the licensee's training program appeared to be comprehensive and was well documented.

Through discussions with licensed operators and a review of records, the inspector also verified that each operator was receiving a biennial medical examination as required.

c. Conclusions

The requirements of the Operator Requalification Program were being met and the program was being acceptably implemented. Medical examinations for facility operators were being completed biennially as required.

**5. Procedures and Procedural Control**

a. Inspection Scope (IP 69001)

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

- Selected operating procedures and administrative logs
- Selected forms and checklists associated with current procedures
- Procedural reviews and updates as documented in RSC meeting minutes
- UWNR Procedure No. 005, "UWNR Administrative Guide," Rev 59
- The two most recent Annual Operating Reports issued by the facility

b. Observations and Findings

The inspector determined that the licensee had developed procedures for the operations, tasks, and conditions listed in Section 6.4 of the TS. The inspector noted that procedure UWNR Procedure No. 001, "Standing Operating Instructions," specified the role and use of procedures at the facility. The licensee's procedures and checklists were found to be acceptable for the current facility status, staffing, and level of operations. The procedures were being audited and/or reviewed annually, as noted earlier, and were updated as needed.

Minor changes of some types of procedures were allowed to be reviewed and approved by two SROs. These types of items were presented to the RSC for information and were reviewed by that committee. Major changes to the procedures were required to be reviewed and approved by the RSC prior to implementation. The inspector determined that substantive revisions to checklists and forms were presented to the RSC for review and approval as required. The inspector verified that the latest revisions to selected procedures and forms had been through this review and approval process.

c. Conclusions

Facility procedures satisfied TS Section 6.5 requirements and procedure reviews were being completed annually.

## 6. Fuel Handling

### a. Inspection Scope (IP 69001)

In order to verify adherence to fuel handling and inspection requirements specified in TS Sections 3.1.4, 3.1.6, 4.1, 5.3 and 5.4, the inspector reviewed:

- UWNR LEU Fuel Bundle Data Record Books
- Core Status Boards located at the reactor pool top and in the Control Room
- Operator Information Book which included core loading diagrams and standard fuel loading instructions
- Selected Operations Log Sheets, checklists, and associated forms and records for 2014 and to date in 2015
- Various UWNR Procedures including Procedure No. 143, "Procedure for Fuel Handling and Core Arrangements," Rev. 3 and Procedure No. 143A, "Core Loading Diagram," Rev. 4
- The two most recent Annual Operating Reports issued by the facility

### b. Observations and Findings

The inspector verified that the reactor fuel bundles in the core and in storage were being inspected annually as required by TS. The results of the inspections were recorded as required and comments on the condition of each fuel bundle were noted on the appropriate pages in the Fuel Record Book. The procedures and the controls specified for these operations were acceptable.

The inspector determined that the licensee was maintaining the required records of the various fuel movements that had been completed using Fuel Movement Log Sheets. This information was routinely stored with the facility Operating Log Sheets. The inspector verified that the movements were conducted and recorded in compliance with procedure. The current core was designated as Core K21-R6.

### c. Conclusions

Reactor fuel movements and inspections were completed and documented in accordance with procedure. The fuel was being inspected as specified by TS Section 4.1, and the core was arranged as required in TS Section 5.4.

## 7. Maintenance and Surveillance

### a. Inspection Scope (IP 69001)

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

- Selected preventive maintenance records for 2014 and to date in 2015
- Open Pool Reactor Manual (OPRM) referenced in UWNR Procedure No.

- 100A
- Selected forms and records associated with the procedures UWNR listed below
- Various UWNR Procedures including Procedure No. 100, "Surveillance Activities," Rev. 56 and Procedure No. 169, "Annual Maintenance Procedure," Rev. 16
- The two most recent Annual Operating Reports issued by the facility

b. Observations and Findings

(1) Maintenance

The inspector reviewed the maintenance that had been completed for 2014 and to date in 2015 as required by UWNR Procedure No. 100 and UWNR Procedure No. 169. The records indicated that some maintenance was conducted monthly and some annually as required. The majority of the annual maintenance was completed in June each year. Also, preventive maintenance activities were tracked and conducted as scheduled and any problems found were addressed in accordance with the TS, applicable procedures, the OPRM, or other equipment manuals. Maintenance activities ensured that equipment remained consistent with the Safety Analysis Report and TS requirements. Unscheduled maintenance or repairs were reviewed to determine if they required 50.59 evaluations. The inspector verified that system verifications and operational checks were performed to ensure system operability following maintenance and before the equipment involved was returned to service.

(2) Surveillance

The inspector determined that selected daily, weekly, monthly, semiannual, and annual checks, tests, and verifications for required Limiting Conditions of Operation (LCO) and surveillance activities were completed as stipulated. Those 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 appeared to be complete and were being maintained as required.

c. Conclusions

Maintenance logs and records were being maintained and maintenance activities were being conducted in accordance with procedural requirements. The program for surveillance and LCO verifications was being carried out in accordance with TS requirements.

**8. Experiments**

a. Inspection Scope (IP 69001)

In order to verify that experiments were being conducted in accordance with approved procedural guidelines and reviewed and approved as specified in TS Section 6.5 and within, the inspector reviewed:

- Control of irradiated items and potential hazards identification
- Records of recently proposed experiments and/or changes to approved experiments documented on forms entitled, "Experiment Review Questionnaire"
- Selected forms and records associated with those procedures UWNR listed below
- Various UWNR Procedures including Procedure No. 002, "Experiment Standing Operating Instructions," Rev. 12, RSC and Procedure No. 030, "Experiment Review Questionnaire," Rev. 7

b. Observations and Findings

In accordance with the licensee's TS, experiments were classified as "routine," "modified routine," or "special." It was noted that routine and modified routine experiments could be conducted at the discretion of the SRO responsible for reactor operation. Special experiments were required to be reviewed by the RSC and possibly were of such a nature that they could require review and approval by the NRC. It was noted that three routine experiments were currently in use at the facility.

It was noted that one new experiment had been initiated recently. It dealt with the accurate measurement of the rate of energy deposition (nuclear heating) in a variety of materials. The inspector reviewed the new and current experiments and verified that they had been reviewed and approved by the Reactor Director as required. Copies of the Experiment Review Questionnaires for the routine experiments had also been forwarded to the RSC for review by the committee. The Experiment Review Questionnaire associated with the new experiment had been submitted to, and reviewed and approved by, the RSC as required. Irradiation authorizations, documented on UWNR 134 forms, had also been reviewed and approved as required.

The conduct and results of the experiments and irradiations were documented on the Operations Log Sheets and on the irradiation request forms, UWNR Procedure No. 130, "Request for Isotope Production." The inspector verified that experiments and irradiations were conducted, and the material produced was controlled, as required in the TS, the applicable questionnaires or authorizations, and the associated procedures.

c. Conclusions

Conduct and control of experiments and irradiations met the requirements specified in the TS Section 6.8, the applicable experiment and irradiation authorizations, and associated procedures.

**9. Emergency Preparedness**

a. Inspection Scope (IP 69001)

To ensure that the licensee's emergency response program was being conducted in accordance with UWNR Procedure No. 006, "University of Wisconsin Nuclear Reactor Emergency Plan," Rev. 7, RSC approval dated May 25, 2015 (the licensee's Emergency Plan), the inspector reviewed:

- Offsite support for the UWNR facility
- Records of emergency and evacuation drills
- Training records regarding emergency response
- Various UWNR Procedures including Procedure No. 005, "UWNR Administrative Guide," Rev. 59 and UWNR Procedure No. 150, "Emergency Procedure - Reactor Accident, Fission Product Release, or Major Spill of Radioactive Materials," Rev. 22
- Emergency response requirements stipulated in ANSI/ANS 15.16 – 1982 (R1988), "Emergency Planning for Research Reactors"

b. Observations and Findings

The emergency plan in use at the UWNR Laboratory was the facility procedure, UWNR Procedure No. 006, "University of Wisconsin Nuclear Reactor Emergency Plan." The Emergency Plan (E-Plan) was audited and reviewed annually as required. E-Plan Implementing Procedures, UWNR Procedure Numbers 150-154, 156 and 157, were also reviewed annually and revised as needed.

The inspector, accompanied by licensee personnel, reviewed the materials maintained in the Emergency Support Center at the facility. The inspector verified that the required supplies, instrumentation, and equipment were being maintained, controlled, and inventoried annually as required.

Through records review and interviews with licensee and support personnel, emergency responders were found to be knowledgeable of the proper actions to take in case of an emergency. One agreement with an off-site response organization, the University of Wisconsin Hospital and Clinics, was updated every two years and was being maintained as detailed in the facility E-Plan. Other agreements were not needed because the fire department and police force were under statutory requirements to respond to the UWNR in case of an emergency. Communications capabilities with these support groups were tested periodically and were acceptable.

Emergency drills for operations personnel were conducted semiannually as required by the E-Plan. One of the semiannual drills was required to include a practice evacuation of the facility. The other drill involved reviewing the emergency procedures, discussing what actions to take, and conducting walk-through training in various areas or on various pieces of equipment. The results of the drills were documented and filed.

Training for reactor staff personnel in emergency response was conducted and documented through the Operator Requalification Program. The inspector

verified that the E-Plan and implementing procedures were reviewed annually by UWNR staff as a part of their training. As noted earlier, a review of facility logs and training records showed that other related training and classroom instruction had also been conducted as required.

The inspector and the UWNR Facility Director and Reactor Supervisor visited the offices of the 54<sup>th</sup> WMD Civil Support Team (CST) of the Wisconsin National Guard and met with members of that "first responder" organization. CST members provided an in-depth briefing on their training, equipment, and capabilities. CST members also provided the inspector and reactor staff with a tour of their facility. The assets available to the CST for emergency response, including various vehicles and different types of analytical equipment, were observed. It was evident that team members were very knowledgeable and extremely well equipped to provide whatever support the State of Wisconsin would need in the event of a major emergency in the state. Although such support might not be needed at the Nuclear Reactor Laboratory, it was noted that their unit would be available if requested by the proper authority.

c. Conclusions

The inspector concluded that the emergency preparedness program was being conducted in accordance with the Emergency Plan because: 1) The Emergency Plan and Implementing Procedures were being reviewed annually as required and updated as needed; 2) emergency response facilities and equipment were being maintained as required; 3) emergency responders were knowledgeable of proper actions to take in case of an emergency; 4) off-site support was acceptable; 5) semiannual drills were being conducted as required by the E-Plan; and 6) emergency preparedness training for staff personnel was being completed as required.

**10. Follow-up On Previously Identified Items**

a. Inspection Scope (IP 92701)

The inspector reviewed the licensee's actions taken in response to a previously identified Inspector Follow-up Item (IFI).

- IFI 50-156/2014-201-02 - Follow-up on the licensee's actions to implement an electronic system to prevent recurrence of operators leaving the key in the reactor console.

b. Observations and Findings

On October 4, 2013, a facility reactor operator left the control room unattended for 67 seconds. The Reactor Director was immediately notified of the event. The licensee subsequently notified the NRC's Headquarters Operations Officer (HOO) at about 3:30 p.m. and submitted a letter detailing the event which was dated October 17, 2013.

Various corrective actions were initiated. All operations staff members were made aware of the event the afternoon of October 4, 2013. The TS requirements

in Section 6 were evaluated during the annual written exam conducted in accordance with the facility Proficiency Maintenance Program on November 25, 2013. Finally, because of the recurring nature of violating TS 6.1.3(1)(a) at the facility, the licensee has committed to implement an electronic surveillance system within one year to prevent further occurrences. The NRC indicated that this issue would be considered as an Inspector Follow-up Item and would be reviewed during a future inspection.

During this inspection the inspector reviewed the actions taken concerning implementation of the electronic surveillance system. The licensee had initiated the practice of having the Reactor Operator who was signed into the log, and who was responsible for reactor operations and the reactor key, wear a badge which stated "On Duty RO." This badge had a Radio-Frequency Identification (RFID) tag attached to the back. The licensee had also installed sensors or detectors at each of the exit points of the Control Room which would alarm if the badge (with the RFID tag attached) passed through the exit. (This system is a similar to those employed by various stores to prevent people from taking expensive items from the store without paying for them.) The inspector observed a demonstration of the effectiveness of the tag and detector system. The detector alarmed each time the individual wearing the badge passed by. The system appeared to be an appropriate remedy for the problem. This issue is considered closed.

c. Conclusions

The system developed by the licensee appeared to be appropriate in preventing an operator from leaving the Control Room and forgetting to remove the key from the reactor console.

**11. Exit Meeting Summary**

The inspection scope and results were summarized on June 11, 2015, with licensee representatives. The inspector discussed the findings for each area reviewed. The licensee acknowledged the results of the inspection.

## **PARTIAL LIST OF PERSONS CONTACTED**

### **Licensee Personnel**

|            |                    |
|------------|--------------------|
| R. Agasie  | Reactor Director   |
| C. Edwards | Reactor Supervisor |
| A. Gross   | Reactor Operator   |
| A. Malie   | Reactor Operator   |

### **Other Personnel**

|            |  |
|------------|--|
| J. Davison | Major, Deputy Commander, 54 <sup>th</sup> WMD Civil Support Team, Wisconsin National Guard       |
| B. Gruber  | Police Sergeant, University of Wisconsin Police Department                                       |
| S. Kaste   | Captain, Operations Officer, 54 <sup>th</sup> WMD Civil Support Team, Wisconsin National Guard   |
| E. Leckel  | Lieutenant Colonel, Commander, 54 <sup>th</sup> WMD Civil Support Team, Wisconsin National Guard |

## **INSPECTION PROCEDURES USED**

|          |                                     |
|----------|-------------------------------------|
| IP 69001 | Class II Research and Test Reactors |
| IP 92701 | Follow Up on Open Items             |

## **ITEMS OPENED, CLOSED, AND DISCUSSED**

### **Opened**

None

### **Closed**

|                    |     |  |
|--------------------|-----|--|
| 50-156/2014-201-02 | IFI | Follow-up on the licensee's actions to implement an electronic system to prevent recurrence of operators leaving the key in the reactor console. |
|--------------------|-----|--|

## **PARTIAL LIST OF ACRONYMS USED**

|        |  |
|--------|--|
| 10 CFR | Title 10 of the <i>Code of Federal Regulations</i> |
| E-Plan | Emergency Plan                                     |
| IFI    | Inspector Follow-up Item                           |
| IP     | Inspection Procedure                               |
| LCO    | Limiting Conditions of Operation                   |
| No.    | Number   |
| NRC    | Nuclear Regulatory Commission                      |
| OPRM   | Open Pool Reactor Manual                           |
| PARS   | Publicly Available Records                         |
| RFID   | Radio-frequency Identification                     |

|      |   |
|------|---|
| Rev. | Revision                                |
| RO   | Reactor Operator                        |
| RSC  | Reactor Safety Committee                |
| SRO  | Senior Reactor Operator                 |
| TS   | Technical Specifications                |
| UW   | University of Wisconsin                 |
| UWNR | University of Wisconsin Nuclear Reactor |