

May 19, 2011

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. 50-156/2011-201

Dear Mr. Agasie:

On April 25 - 27, 2011, the U.S. Nuclear Regulatory Commission (NRC, the Commission) completed an inspection at your University of Wisconsin Nuclear Reactor Laboratory (Inspection Report No. 50-156/2011-201). The enclosed report documents the inspection results, which were discussed on April 27, 2011, with you and members of your staff.

The 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 reviewed selected procedures and records, observed activities, and interviewed personnel. 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).

Should you have any questions concerning this inspection, please contact Mike Morlang at (301) 415-4092 or by electronic mail at Gary.Morlang@nrc.gov.

Sincerely,

/RA/

Johnny H. Eads, Jr., 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. 50-156/2011-201
cc w/encls: See next page

University of Wisconsin

Docket No. 50-156

cc:

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

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

Docket No: 50-156

License No: R-74

Report No: 50-156/2011-201

Licensee: University of Wisconsin

Facility: Nuclear Reactor Laboratory

Location: Madison, WI

Dates: April 25 - 27, 2011

Inspector: Mike Morlang
Craig Bassett

Approved by: Johnny H. Eads, Jr., 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: 50-156/2011-201

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the University of Wisconsin (the licensee's) one megawatt (1 MW) Class II research reactor safety program including: 1) organizational structure and staffing; 2) operations logs and records; 3) procedures; 4) requalification training; 5) surveillance and limiting conditions for operations, 6) experiments; 7) emergency planning; 8) maintenance logs and records; and 9) fuel handling logs and records since the last NRC inspection of these areas. The licensee's program was acceptably directed toward the protection of public health and safety, and in compliance with the U.S. Nuclear Regulatory Commission (NRC) requirements. No violations or deviations were identified.

Organizational Structure and Staffing

- The facility organization and staffing were in compliance with the requirements specified in the Technical Specifications.

Operations Logs and Records

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

Procedures

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

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..

Surveillance and Limiting Conditions for Operations

- 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 Planning

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

Maintenance Logs and Records

- Maintenance logs and records were being kept and maintenance activities were being conducted in accordance with procedural requirements.

Fuel Handling Logs and Records

- Reactor fuel movements and inspections were completed and documented in accordance with procedure.

REPORT DETAILS

Summary of Plant Status

The University of Wisconsin (UW, the licensee) continued to operate the one megawatt (1 MW) TRIGA reactor as needed (typically on Tuesdays and Thursdays) in support of laboratory and lecture courses, and research. During this inspection, the reactor was operated at various power levels up to 1 MW for physics experiments and to support research and training.

1. Organizational Structure and Staffing

a. Inspection Scope (Inspection Procedure [IP] 69001)

To verify that the organization and staffing requirements specified in Section 6.1 of the facility Technical Specifications (TS), as implemented through the recently renewed facility License Number (No.) R-74, dated March 25, 2011, were being met, the inspectors reviewed:

- Management responsibilities stipulated in the TS
- Staffing requirements for safe operation of the reactor facility
- Organizational structure for the Nuclear Reactor Laboratory
- Selected Operations Log Sheets, checklists, and associated forms and records for 2010 and to date in 2011
- University of Wisconsin Nuclear Reactor (UWNR) Procedure No. 001, "Standing Operating Instructions," Revision (Rev.) 14, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 112, "Operating Log Sheet," Rev. 8, latest Reactor Safety Committee approval dated June 16, 2010
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2008 – 2009 Annual Operating Report," for the period from July 2008 through June 2009," submitted to the NRC on August 10, 2009
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2009 – 2010 Annual Operating Report," for the period from July 2009 through June 2010," submitted to the NRC on July 29, 2010
- American National Standards Institute/American Nuclear Society (ANSI/ANS) Standard ANSI/ANS-15.4-2007, "Standards for Selection and Training of Personnel for Research Reactors"

b. Observations and Findings

(1) Organization

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 2010 (Inspection Report No. 50-156/2010-201). 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 Chair of the Engineering Physics Department as required.

The licensee's current operational organization consisted of the Reactor Director, the Reactor Supervisor, a Reactor Instrumentation Specialist, and various reactor operators. The Reactor Director, Supervisor, and Instrumentation Specialist positions were full-time positions. It was noted that all of these individuals were also qualified Senior Reactor Operators (SROs). The other individuals who worked at the facility, did so on a part-time basis. One of these individuals was an SRO and was a member of the administrative staff in the department. Five other part-time personnel were students and qualified Reactor Operators (ROs). This organization was consistent with that specified in the TS.

(2) Staffing

Section 6.1.3 of the newly issued TS states that:

1. The minimum staffing when the reactor is not secured shall be:
 - a. A licensed reactor operator in the control room (if licensed senior reactor operator, may also be the person required in c).
 - b. A second designated person present at the facility or readily available by phone or radio and within 1000 feet capable of carrying out prescribed written instructions.
 - c. A designated senior reactor operator shall be readily available at the facility or on call. On call means the individual can be rapidly reached by phone or radio and is within 30 minutes or 15 miles of the reactor facility.

The inspectors discussed the "new" TS staffing requirements noted above with the Reactor Director. The Director indicated that there was no current mechanism in place to document or properly denote that the minimum staffing requirements were met on a daily basis. The licensee was in the process of revising UWNR Procedure No. 001, "Standing Operating Instructions," which details the various duties and responsibilities of licensed personnel. It was anticipated that this procedure would be used to outline how the requirements of TS Section 6.1.3 will be met. The Reactor Director was informed that the issue of revising UWNR Procedure No. 001 so that it specifies how to document the specified staffing to comply with TS Section 6.1.3 would be followed by the NRC as an Inspector Follow-up Item (IFI) and would be reviewed during a future inspection (IFI 50-156/2011-201-01).

c. Conclusion

The licensee's organization met the requirements specified in the TS and applicable procedures. The licensee was evaluating how to document compliance with the staffing requirements specified in the TS.

2. Reactor Operations, Logs, and Records

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following to ensure that actions taken during routine operations or during abnormal occurrences were in compliance with TS Sections 2, 3, and 6.6, and with the procedures specified in TS Section 6.4:

- UWNR Operators Turn-Over Log maintained on the computer in the Control Room
- Selected Operations Log Sheets, checklists, and associated forms and records for 2010 and to date in 2011
- Selected audits completed by Radiation Safety Office staff personnel documented in monthly reports submitted to the RSC entitled "Nuclear Reactor Audit and Report" for 2010 and to date in 2011
- Various audits completed by operations staff personnel documented in monthly reports submitted to the RSC entitled "Monthly Operations Summary" for 2010 and to date in 2011
- UWNR Procedure No. 001, "Standing Operating Instructions," Rev. 14, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 110, "Daily Reactor Pre-Startup Check List," Rev. 51, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 111, "Reactor Startup Check Sheet," Rev. 43, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 112, "Operating Log Sheet," Rev. 8, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 114, "Reactor Shutdown Checklist," Rev. 17, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 115, "SCRAM," Rev. 5, latest Reactor Safety Committee approval dated June 16, 2010
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2008 – 2009 Annual Operating Report," for the period from July 2008 through June 2009," submitted to the NRC on August 10, 2009
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2009 – 2010 Annual Operating Report," for the period from July 2009 through June 2010," submitted to the NRC on July 29, 2010

b. Observations and Findings

The inspectors observed various activities and operations on Tuesday, April 26, 2011. The operations included reactor start-up and full power operation. It was

noted that the appropriate forms and checklists were completed and that the appropriate data were recorded as required.

The inspectors reviewed selected Daily Reactor Pre-Startup Check Lists, Reactor Startup Check Sheets, Operating Log Sheets, and Reactor Shutdown Checklists from January 2010 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 and first hand observation, the inspectors determined that reactor operations were carried out according to 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 resumption of operations under the authorization of a licensed SRO.

The inspectors verified that TS and procedure required items were logged and cross referenced with other logs and/or forms, as required, and that TS operational limits had not been exceeded.

c. Conclusion

Reactor operations were conducted in accordance with TS requirements and applicable procedures.

3. Procedures

a. Inspection Scope (IP 69001)

To determine whether facility procedures met the requirements outlined in TS Section 6.4, the inspectors 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. 001, "Standing Operating Instructions," Rev. 14, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 005, "UWNR Administrative Guide," Rev. 53, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 021, "UWNR Quality Assurance Program for Spent Nuclear Fuel Shipments," Rev. 0, latest Reactor Safety Committee approval dated June 16, 2010
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2008 – 2009 Annual Operating Report," for the period from July 2008 through June 2009," submitted to the NRC on August 10, 2009
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2009 – 2010 Annual Operating Report," for the period from July 2009 through June 2010," submitted to the NRC on July 29, 2010

b. Observations and Findings

The inspectors determined that the licensee had developed procedures for the items and conditions listed in Section 6.4 of the TS. The inspectors noted that procedure UWNR Procedure No. 001, "Standing Operating Instructions," specified the responsibilities of the various members of the staff and the role and use of procedures at the facility. As noted above, the procedure was being revised to specify the documentation of various TS requirements. The licensee's procedures and checklists were found to be acceptable for the current facility status, staffing, and operations level. 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 inspectors determined that substantive revisions to checklists and forms were also routinely presented to the RSC for review and approval. The inspectors verified that the latest revisions to selected procedures and forms had been through this review and approval process as required.

Through observation of various activities during this inspection, the inspectors noted that operations were completed in accordance with the applicable checklists and procedures as required. Adherence to procedure was acceptable.

c. Conclusion

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

4. 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 June 16, 2010 (the licensee's operator requalification plan) and 10 CFR Part 55, and that medical requirements were met, the inspectors reviewed:

- Active operators' license status
- Written examination records for 2009 and 2010
- Operator medical examination records from 2009 to the present
- Selected Operations Log Sheets, checklists, and associated forms and records for 2009 and to date in 2010
- "Individual Record Sheet - UWNR Operator Proficiency Maintenance Program" for 2010 and 2011 to date

- “UWNR Proficiency Maintenance Course Operator Evaluation Check Sheet“ for 2010 and 2011 to date
- “UWNR Operator Proficiency Maintenance Program - Class Record Sheets” for 2010 and 2011 to date
- Logs and records of reactivity manipulations documented on forms associated with UWNR Procedure No. 112, “Operating Log Sheet,” Rev. 8, RSC approval dated June 16, 2010
- “The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2009 – 2010 Annual Operating Report,” for the period from July 2009 through June 2010,” submitted to the NRC on July 29, 2010

b. Observations and Findings

As noted above, there are currently four qualified SROs at the facility and five ROs. All of the operators’ licenses were verified to be current.

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 indicating the completion of the quarterly performance evaluations were also maintained. The inspectors 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 inspectors also verified that each operator was receiving a biennial medical examination as required.

c. Conclusion

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. Surveillance and Limiting Conditions for Operations

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 the inspectors reviewed:

- Selected forms and records associated with the UWNR Procedures Nos. 100, 100A, 120, 143, 169, NS 200

- UWNR Procedure No. 100, "Surveillance Activities," Rev. 49, latest Reactor Safety Committee approval dated December 13, 2010
- UWNR Procedure No. 100A, "PM Services - Definition," Rev. 40, latest Reactor Safety Committee approval dated December 13, 2010
- UWNR Procedure No. 120, "After Maintenance Checks," Rev. 18, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 143, "Procedure for Fuel Handling and Core Arrangements," Rev. 2, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 169, "Annual Maintenance Procedure," Rev. 10, latest Reactor Safety Committee approval dated December 13, 2010
- UWNR Procedure No. 200, "Maintenance and Trouble Shooting," Rev. 17, latest Reactor Safety Committee approval dated December 13, 2010
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2008 – 2009 Annual Operating Report," for the period from July 2008 through June 2009," submitted to the NRC on August 10, 2009
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2009 – 2010 Annual Operating Report," for the period from July 2009 through June 2010," submitted to the NRC on July 29, 2010

b. Observation and Findings

The inspectors 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. Conclusion

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

6. Experiments

a. Inspection Scope (IP 69001)

In order to verify that experiments were being conducted in accordance with TS and within approved guidelines, the inspectors 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
- UWNR Procedure No. 002, "Experiment Standing Operating Instructions," Rev. 12, RSC approval dated June 16, 2010
- UWNR Procedure No. 030, "Experiment Review Questionnaire," Rev. 6, RSC approval dated June 16, 2010
- UWNR Procedure No. 130, "Request for Isotope Production," Rev. 17, RSC approval dated June 16, 2010
- UWNR Procedure No. 131, "Production of Radioisotopes in Nuclear Reactor," Rev. 21, RSC approval dated June 16, 2010
- UWNR Procedure No. 132, "Pneumatic Tube Operating Procedure," Rev. 15, RSC approval dated December 13, 2010
- UWNR Procedure No. 134, "Request and Authorization for Services of the University of Wisconsin Reactor," Rev. 3, RSC approval dated June 16, 2010
- UWNR Procedure No. 135, "Rotator Operating Procedure," Rev. 2, RSC approval dated June 16, 2010
- UWNR Procedure No. 136, "Procedure for Beam Port or Thermal Column Irradiations," Rev. 8, RSC approval dated June 16, 2010
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2008 – 2009 Annual Operating Report," for the period from July 2008 through June 2009," submitted to the NRC on August 10, 2009
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2009 – 2010 Annual Operating Report," for the period from July 2009 through June 2010," submitted to the NRC on July 29, 2010

b. Observations and Findings

The inspectors determined that no new experiments had been initiated since the last inspection in this area in July 2009. The inspector reviewed those experiments that had been approved in the past and verified that they had been reviewed and approved by the Reactor Director as required. Copies of the Experiment Review Questionnaires had also been forwarded to the RSC for information and the RSC had reviewed them as well. 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 inspectors 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. Conclusion

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

7. 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. 4, RSC approval dated May 14, 2009 (the licensee's Emergency Plan), the inspectors reviewed:

- Offsite support for the UWNR facility
- Records of emergency drills and critiques
- Training records regarding emergency response
- Emergency response supplies, equipment, and instrumentation
- UWNR Procedure No. 005, "UWNR Administrative Guide," Rev. 53, RSC approval dated December 13, 2010
- UWNR Procedure No. 150, "Emergency Procedure - Reactor Accident, Fission Product Release, or Major Spill of Radioactive Materials," Rev. 22, RSC approval dated December 13, 2010
- UWNR Procedure No. 151, "Emergency Procedure - Leak Resulting in Draining of Reactor Pool," Rev. 20, RSC approval dated December 13, 2010
- UWNR Procedure No. 152, "Emergency Procedure - Suspected Fission Product Leak," Rev. 14, RSC approval dated December 13, 2010
- UWNR Procedure No. 153, "Emergency Procedure - Threat to Security of Reactor Laboratory (Riot, Civil Disturbance, Unauthorized Entry, or Bomb Threat)," Rev. 10, RSC approval dated December 13, 2010
- UWNR Procedure No. 154, "Emergency Procedure - Theft or Threat of Theft of SNM: Breaching of Security of Reactor Laboratory," Rev. 9, RSC approval dated December 13, 2010
- UWNR Procedure No. 156, "Reactivity and/or Power Level," Rev. 2, RSC approval dated December 13, 2010
- UWNR Procedure No. 157, "Emergency Procedure - Fire, Radioactive Material Spills, Radioactive Dust, Fumes, and Gases; Personnel Injuries Involving Radioactivity; Personnel Overexposures," Rev. 12, RSC approval dated December 13, 2010

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 verified that the required supplies, instrumentation, and equipment were being maintained, controlled, and inventoried annually as stipulated by one of the NCPs mentioned earlier.

Through records review and interviews with licensee and support 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 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.

Emergency drills for operations personnel were conducted semiannually as required by the E-Plan. 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 inspectors verified that the E-Plan and implementing procedures were reviewed annually by UWNR staff as a part of their training as required.

The inspectors visited the Dane County Emergency Management Operations Center and discussed their procedures for responding to an emergency at the UWNR. The inspectors toured the UW Police Department dispatch center and spoke with the dispatchers on duty. Additionally, the inspectors visited Madison Fire Department Station 6 which houses the Hazardous Intervention Team equipment and toured the State of Wisconsin Mobile Command Center used for radiological emergencies.

c. Conclusion

The inspectors concluded that the emergency preparedness program was being conducted in accordance with the Emergency Plan.

8. Maintenance Logs and Records

a. Inspection Scope (IP 69001)

To determine that maintenance activities were being conducted, the inspectors reviewed:

- Selected preventive maintenance records for 2010 and to date in 2011
- Selected forms and records associated with the UWNR Procedures Nos. 100, 100A, 120, 143, 169, NS 200
- UWNR Procedure No. 100, "Surveillance Activities," Rev. 49, latest Reactor Safety Committee approval dated December 13, 2010
- UWNR Procedure No. 100A, "PM Services - Definition," Rev. 40, latest Reactor Safety Committee approval dated December 13, 2010
- UWNR Procedure No. 120, "After Maintenance Checks," Rev. 18, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 143, "Procedure for Fuel Handling and Core Arrangements," Rev. 2, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 169, "Annual Maintenance Procedure," Rev. 10, latest Reactor Safety Committee approval dated December 13, 2010

- UWNR Procedure No. 200, "Maintenance and Trouble Shooting," Rev. 17, latest Reactor Safety Committee approval dated December 13, 2010
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2008 – 2009 Annual Operating Report," for the period from July 2008 through June 2009," submitted to the NRC on August 10, 2009
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2009 – 2010 Annual Operating Report," for the period from July 2009 through June 2010," submitted to the NRC on July 29, 2010

b. Observations and Findings

The inspectors reviewed the maintenance and repair records and logs for 2010 and to date in 2011 that were maintained as required by UWNR Procedure No. 100 and UWNR Procedure No. 169. The records indicated that maintenance was conducted annually as required (typically in the summer). Also, preventive maintenance activities were tracked and conducted as scheduled in UWNR Procedure No. 100 and any problems found were addressed in accordance with the TS, applicable procedures, or 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. Verifications and operational systems checks were performed to ensure system operability before the equipment involved was returned to service.

c. Conclusion

Maintenance logs and records were being maintained and maintenance activities were being conducted in accordance with procedural requirements.

9. Fuel Handling Logs and Records

a. Inspection Scope (IP 69001)

In order to verify adherence to fuel handling and inspection requirements specified in TS Sections 3.1, 4.3, and 5.4, the inspectors reviewed:

- 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 2010 and to date in 2011
- UWNR Procedure No. 140, "Procedure for Disassembly of Four-Element Fuel Bundles," Rev. 5, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 141, "Procedure for Reassembling Fuel Elements into Four-Element Bundles," Rev. 4, latest Reactor Safety Committee approval dated June 16, 2010

- UWNR Procedure No. 142, "Procedure for Measuring Fuel Element Bow and Growth," Rev. 16, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 143, "Procedure for Fuel Handling and Core Arrangements," Rev. 2, latest Reactor Safety Committee approval dated June 16, 2010, including a form entitled, "Specific Core Component Handling Steps for XXX (number or title filled in by operator)"
- UWNR Procedure No. 143A, "Core Loading Diagram," Rev. 2, latest Reactor Safety Committee approval dated June 16, 2010
- UWNR Procedure No. 169, "Annual Maintenance Procedure," Rev. 10, latest Reactor Safety Committee approval dated December 13, 2010
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2008 – 2009 Annual Operating Report," for the period from July 2008 through June 2009," submitted to the NRC on August 10, 2009
- "The University of Wisconsin Nuclear Reactor Laboratory Fiscal Year 2009 – 2010 Annual Operating Report," for the period from July 2009 through June 2010," submitted to the NRC on July 29, 2010

b. Observations and Findings

It was noted that, with the conversion to the use of Low Enriched Uranium (LEU) fuel at the facility, the TRIGA fuel currently being used in the core was designated as LEU 30/20 uranium-zirconium hydride fuel. The inspectors also noted that the latest core configuration was listed as Core J21-R14. The configuration met the requirements of TS Sections 3.1 and 5.4.

The inspectors verified that the licensee had initiated annual inspection of the new LEU reactor fuel bundles in the core and in storage 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 forms. The procedures and the controls specified for these operations were acceptable.

The inspectors determined that the licensee was maintaining the required records of the various fuel movements that had been completed and this information was routinely stored with the facility Operating Log Sheets. The inspectors verified that the movements were conducted and recorded in compliance with procedure. Fuel locations were recorded on the UWNR 143 forms. Current fuel bundle locations were also maintained on the Fuel Status Boards, one of which was located at the top of the reactor pool and the other in the Control Room.

c. Conclusion

Reactor fuel movements and inspections were completed and documented in accordance with procedure. The fuel was being inspected as specified by TS Section 3.1 and 4.3, and the core was arranged as required in TS Section 3.1 and 5.4.

10. Follow-up on Previously Identified Items

a. Inspection Scope (IP 92701)

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

b. Observation and Findings

Inspector Follow-up Item (IFI) - 50-156/2009-201-01 – Follow-up on the licensee's actions to complete a review of the NCPs to determine whether or not they should be incorporated into the official UWNR, RSC-approved series of procedures.

During an inspection of the facility in 2009, the inspectors noted that the licensee had developed many "non controlled procedures" (NCPs) to capture some of the "corporate" knowledge that was not documented in any other manner. These NCPs were helpful but were not part of the official UWNR series of RSC-reviewed and -approved procedures. Thus they were not required to be reviewed annually and any changes were not subject to RSC review and approval. The licensee was aware of the need to review these NCPs and was considering whether or not they needed to be incorporated into the UWNR series of procedures. The licensee was informed that the issue of completing a review of the NCPs to determine whether or not they should be incorporated into the official UWNR, RSC-approved series of procedures would be followed by the NRC as an IFI.

During this inspection, it was noted that the licensee had taken action to address this issue. The NCPs had been reviewed and the contents of most of the NCPs were being incorporated into existing UWNR procedures. However, to date, all the contents of the NCPs had not been added to existing procedures. This was scheduled to be completed in the fall. Because of this, the licensee was informed that this IFI will remain open.

c. Conclusion

One IFI identified during a previous inspection was discussed but, since not all corrective actions had been completed, the IFI will remain open.

11. Exit Meeting Summary

The inspection scope and results were summarized on April 27, 2011, with licensee representatives. The inspectors discussed the findings for each area reviewed. No dissenting comments were received from the licensee.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

R. Agasie	Reactor Director
M. Blanchard	Reactor Supervisor
A. Weier	Reactor Operator
C. Edwards	Nuclear Reactor Technician/Electronics Technician
D. Osburn	Reactor Operator

Other Personnel

J. Lind	Lieutenant, University of Wisconsin Police
C. Brunner	Lieutenant, University of Wisconsin Police
J. McLellan	Population Protection Planner, Dane County Emergency Management
J. Hunt	Radiological Emergency Preparedness Specialist, State of Wisconsin

INSPECTION PROCEDURES USED

IP 69001	Class II Research and Test Reactors
IP 92701	Review of Previously Identified Items

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-156/2011-201-01	IFI	Follow-up on the license's actions to document the specified staffing to comply with TS Section 6.1.3
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Discussed

50-156/2009-201-01	IFI	Follow-up on the licensee's actions to complete a review of the NCPs to determine whether or not they should be incorporated into the official UWNR, RSC-approved series of procedures.
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Closed

None

LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ALARA	As low as reasonably achievable
CORD	Central Ordering, Receiving, and Distribution Office
DDE	Deep Dose Equivalent
IP	Inspection Procedure

mr	millirem
No.	Number
NRC	U. S. Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
Rev.	Revision
RSC	Reactor Safety Committee
SDE	Shallow Dose Equivalent
SRO	Senior Reactor Operator
TS	Technical Specifications
UW	University of Wisconsin
UWNR	University of Wisconsin Nuclear Reactor