

May 23, 2005

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

SUBJECT: NRC INSPECTION REPORT NO. 50-156/2005-201

Dear Mr. Agasie:

This letter refers to the inspection conducted on May 9-12, 2005, at your University of Wisconsin Nuclear Reactor Laboratory. The inspection included a review of activities authorized for your facility. The enclosed report presents the results of that inspection.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. Based on the results of this inspection, no significant safety issues were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/reading-rm/adams.html>.

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

Sincerely,

/RA/

Patrick M. Madden, Section Chief
Research and Test Reactors Section
New, Research and Test Reactors Program
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:

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

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

Docket No: 50-156

License No: R-74

Report No: 50-156/2005-201

Licensee: University of Wisconsin

Facility: Nuclear Reactor Laboratory

Location: Madison, WI

Dates: May 9-12, 2005

Inspector: Craig Bassett

Approved by: Patrick M. Madden, Section Chief
Research and Test Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

University of Wisconsin
Report No: 50-156/2005-201

This routine, announced inspection included onsite review of selected aspects of various licensee programs including: organizational structure and staffing; review and audit functions and design control; procedures and procedural control; operations; operator licenses, requalification, and medical activities; maintenance and surveillance; fuel handling; experiments; and emergency preparedness since the last NRC inspection of this facility. The licensee's programs were directed toward the protection of public health and safety and were in compliance with NRC requirements. No safety concerns or violations of regulatory requirements were identified.

Organizational Structure and Staffing

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

Review and Audit Functions and Design Control

- The review and audit program required by Technical Specifications Section 6.2 was being conducted acceptably and the results were reviewed by the Reactor Safety Committee.
- The 50.59 design change process at the facility was being followed as required and no changes, to date, required NRC approval.

Procedures and Procedural Control

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

Operations

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

Operator Licenses, Requalification, and Medical Activities

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

Maintenance and Surveillance

- Maintenance logs and records were being maintained 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 controls.

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.

Experiments

- Conduct and control of experiments and irradiations met the requirements specified in the 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 acceptable as were communications capabilities.
- 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 licensee's one megawatt (1 MW) TRIGA conversion Research and Test Reactor continued normal, routine operations. A review of the applicable records indicated that the reactor was operated as needed (typically on Tuesdays and Thursdays) in support of laboratory experiments, reactor system testing, reactor maintenance and surveillance, and operator training. During this inspection, the reactor was operated on two separate days at various power levels up to 1 MW for physics experiments and to support research and training.

1. Organizational Structure and Staffing

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

To verify that the organization and staffing requirements specified in the Technical Specifications (TS), Revision 4, dated October 3, 1991, and associated procedures were being met, the inspector reviewed:

- management responsibilities stipulated in the TS
- organizational structure at the Nuclear Reactor Laboratory
- staffing requirements for the research reactor current operations
- University of Wisconsin Nuclear Reactor (UWNR) Procedure Number (No.) 001, "Standing Operating Instructions," Revision (Rev.) 13, Reactor Safety Committee (RSC) approval dated May 14, 2004
- UWNR Procedure No. 112, "Operating Log Sheet," Rev. 8, RSC approval dated May 14, 2004

b. Observations and Findings

Through discussions with licensee representatives, the inspector determined that management responsibilities and the organization at the University of Wisconsin Nuclear Reactor Laboratory had not changed since the previous NRC inspection in June 2004 (Inspection Report No. 50-156/2004-201). The Reactor Supervisor retained direct control and overall responsibility for safe operation and maintenance of the facility as specified in the TS. The Reactor Supervisor reported to the Chancellor of University of Wisconsin-Madison through the Reactor Director and the Dean of Engineering as required.

Since the last inspection in this area, it was noted that the former Reactor Supervisor had retired and that the person who had held the position of Reactor Research Manager had been selected to fill the Reactor Supervisor position. The inspector verified that the person was well qualified to function as the Reactor Supervisor.

The licensee's current operational organization consisted of the Reactor Director, the Reactor Supervisor, and various reactor operators. The Director and Supervisor positions were full-time positions and these individuals were also qualified Senior Reactor Operators (SROs). The other eight operators who worked at the facility did so on a part-time basis. According to the licensee, two of the part-time operators were

SROs and the other five were Reactor Operators (ROs). This organization was consistent with that specified in the TS.

A review of the reactor selected Operating Log Sheets and associated records for the past twelve months 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.

c. Conclusions

Organization and staffing met the requirements specified in the TS and applicable procedures.

2. Review and Audit Functions and Design Control

a. Inspection Scope (IP 69001)

In order to verify that audits had been conducted by University Safety Department personnel as stipulated in TS Section 6.1.c, to ensure that reviews had been completed by the Reactor Safety Committee as required by TS Section 6.2, and to determine whether modifications to the facility were consistent with 10 CFR 50.59, the inspector reviewed:

- Reactor Safety Committee (RSC) meeting minutes for November 2003 through the present
- TS duties specified for the RSC including review and oversight functions
- records of design changes and/or modifications to the facility documented on forms entitled, "UWNR Modification Checklist"
- records of newly proposed experiments and/or changes to approved experiments documented on forms entitled, "Experiment Review Questionnaire"
- audits completed by Safety Department staff personnel documented on monthly reports submitted to the RSC entitled "Nuclear Reactor Audit and Report"
- audits completed by operations staff personnel documented on monthly reports submitted to the RSC entitled "Monthly Operations Summary"
- UWNR Procedure No. 005, "UWNR Administrative Guide," Rev. 41, RSC approval dated May 14, 2004
- UWNR Procedure No. 020, "UWNR Modification Checklist," Rev. 1, RSC approval dated May 14, 2004

b. Observations and Findings

(1) Review and Audit Functions

The inspector reviewed the RSC's meeting minutes from November 2003 to the present. These meeting minutes showed that the RSC had met at the required frequency and that a quorum was present. The minutes also indicated that the RSC provided appropriate guidance and direction for reactor operations, and ensured suitable use and oversight of the reactor.

The inspector noted that various audits had been conducted of the facility in the areas of operations, safety programs, and procedures. The inspector noted the RSC reviewed these audits as required. The audits were structured so that the various aspects of the licensee's operations and safety programs were reviewed on a monthly basis. Major facility documents and plans were 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. One of the major changes involved replacing the Tektronix TestLab analog to digital converter (ADC) and digital recorder with a National Instruments PCI-MIO-16E-1 ADC. Another involved replacing the two loop reactor coolant system with a forced draft cooling tower as the ultimate heat sink with a three loop system utilizing the university chilled water system as the ultimate heat sink. More recent changes have involved such issues as construction of a new roof over the Reactor Lab, under pinning of the reactor foundation (during the current construction project), and installation of tower cranes in the vicinity of the reactor.

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 prior to implementation. The RSC determined that none of the changes that had been proposed to date met the criteria of 10 CFR 50.59(c)(2) paragraphs (i) through (viii) and, thus, no NRC approval of the changes was required.

c. Conclusions

Review and oversight functions required by TS Section 6.2 were acceptably completed by the RSC. The 50.59 process for design change at the facility was being followed as required and no changes to date required NRC approval.

3. Procedures and Procedural Control

a. Inspection Scope (IP 69001)

To determine whether facility procedures met the requirements outlined in TS Section 6.5, 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. 001, "Standing Operating Instructions," Rev. 13, RSC approval dated May 14, 2004

- UWNR Procedure No. 005, "UWNR Administrative Guide," Rev. 41, RSC approval dated May 14, 2004

b. Observations and Findings

The licensee's procedures and checklists were found to be acceptable for the current facility status, staffing, and operations level. The inspector noted that procedure UWNR 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. The procedures were being audited/reviewed annually, as noted earlier, and were updated as needed. Major changes to the procedures were reviewed and approved by the RSC prior to implementation. It was also determined that substantive revisions to checklists and forms were routinely presented to the RSC for review and ratification as well. The inspector 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 inspector noted that operations were completed in accordance with the applicable checklists and procedures as required.

c. Conclusions

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

4. 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 6.3 and 6.4, and with the procedures specified in TS Section 6.5:

- UWNR Special Orders Numbers 2004-01 through -05
- selected forms and records associated with the UWNR procedures listed below
- audits completed by Safety Department staff personnel documented on monthly reports submitted to the RSC entitled "Nuclear Reactor Audit and Report"
- audits completed by operations staff personnel documented on monthly reports submitted to the RSC entitled "Monthly Operations Summary"
- UWNR Procedure No. 001, "Standing Operating Instructions," Rev. 13, RSC approval dated May 14, 2004
- UWNR Procedure No. 110, "Daily Reactor Pre-Startup Check List," Rev. 38, RSC approval dated May 14, 2004
- UWNR Procedure No. 111, "Reactor Startup Check Sheet," Rev. 33, RSC approval dated November 24, 2004
- UWNR Procedure No. 112, "Operating Log Sheet," Rev. 8, RSC approval dated May 14, 2004
- UWNR Procedure No. 114, "Reactor Shutdown Checklist," Rev. 15, RSC approval dated May 14, 2004

- UWNR Procedure No. 115, "SCRAM," Rev. 4, RSC approval dated May 14, 2004
- UWNR Procedure No. 155, "Abnormal Operating Procedure," Rev. 14, RSC approval dated November 24, 2004
- UWNR Procedure No. 156, "Reactivity and/or Power Level," Rev. 2, RSC approval dated November 25, 2002

b. Observations and Findings

The inspector observed various operations on Tuesday and Thursday during this inspection. These operations included such activities as reactor start-up, full power operation, and shut down. It was noted that the appropriate forms and checklists were completed and that the appropriate data were recorded as required. Also, operations were conducted in accordance with the appropriate procedures as noted above.

The inspector reviewed selected Daily Reactor Pre-Startup Check Lists, Reactor Startup Check Sheets, Operating Log Sheets, and Reactor Shutdown Checklists from February 2004 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. As noted above, the inspector determined that reactor operations were carried out following written procedures as required by the TS. Use of maintenance and repair logs satisfied procedural requirements. Significant problems and events noted during operation, and documented in the operations log, were reported, reviewed, and the problems resolved as required by TS and the appropriate 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 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. As noted above, shift staffing was adequate and satisfied the requirements for duty and on-call personnel.

c. Conclusions

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

5. Operator Licenses, Requalification, and Medical Activities

a. Inspection Scope (IP 69001)

To determine that operator requalification activities and training were conducted in accordance with UWNR Procedure No. 004, "Operator Proficiency Maintenance Program," Rev. 4, RSC approval dated May 14, 2004 (the licensee's operator requalification plan), and that medical requirements were met, the inspector reviewed:

- active license status
- written examination records for 2003 and 2004
- operator medical examination records from 2003 to the present

- Memoranda concerning removal from and restoration to active licensed status for the past two years issued by the Reactor Supervisor
- audits completed by operations staff personnel documented on monthly reports submitted to the RSC entitled "Monthly Operations Summary"
- "Individual Record Sheet - UWNR Operator Proficiency Maintenance Program" for the past two years
- "UWNR Proficiency Maintenance Course Operator Evaluation Check Sheet" for the past two years
- "UWNR Operator Proficiency Maintenance Program - Class Record Sheets" for the past three years
- logs and records of reactivity manipulations documented on forms associated with UWNR Procedure No. 112, "Operating Log Sheet," Rev. 8, RSC approval dated May 14, 2004

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 found to be current. It was noted that there are no people in training to become qualified operators as of the date of the inspection.

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 inspector also verified that operators were receiving biennial medical examinations as required.

c. Conclusions

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

6. 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 2004 and to date in 2005
- selected operations log sheets for the past eighteen months
- Open Pool Reactor Manual (OPRM) referenced in UWNR Procedure No. 100A
- selected forms and records associated with the procedures UWNR listed below

- UWNR Procedure No. 002, "Experiment Standing Operating Instructions," Rev. 11, RSC approval dated May 14, 2004
- UWNR Procedure No. 100, "Surveillance Activities," Rev. 39, RSC approval dated November 24, 2004, associated forms, and related manuals
- UWNR Procedure No. 100A, "PM Services - Definitions," Rev. 28, RSC approval dated May 14, 2004
- UWNR Procedure No. 120, "After Maintenance Checks," Rev. 16, RSC approval dated May 14, 2004
- UWNR Procedure No. 143, "Procedure for Fuel Handling and Core Arrangements," Rev. 1, RSC approval dated May 14, 2004
- UWNR Procedure No. 167, "Safety Blade and Transient Rod Fall Time Measurement Procedures," Rev. 14, RSC approval dated November 24, 2004
- UWNR Procedure No. 168, "Procedure for Semiannual Safety Channel Preventive Maintenance and Adjustment," Rev. 6, RSC approval dated November 24, 2004
- UWNR Procedure No. 169, "Annual Maintenance Procedure," Rev. 8, RSC approval dated November 24, 2004
- UWNR Procedure No. 170, "Power Level Calibration Procedure," Rev. 21, RSC approval dated November 24, 2004
- UWNR Procedure No. 173, "Fuel Temperature Channel Calibration Procedure," Rev. 11, RSC approval dated November 24, 2004
- UWNR Procedure No. 200, "Maintenance and Trouble Shooting," Rev. 11, RSC approval dated November 24, 2004

b. Observations and Findings

(1) Surveillance Activities

The inspector determined that selected daily, weekly, monthly, semiannual, and annual checks, tests, and verifications for required Limiting Conditions of Operation (LCOs) 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 were complete and were being maintained as required.

(2) Preventive Maintenance

The inspector reviewed the logs that were maintained as required by UWNR Procedure No. 100 and UWNR Procedure No. 169 for 2004 and to date in 2005. The records indicated that 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 condition 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. Conclusions

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

7. Fuel Movement

a. Inspection Scope (IP 69001)

In order to verify adherence to fuel handling and inspection requirements specified in TS Sections 4.3 and 5.2, the inspector reviewed:

- selected operations logs and records
- UWNR FLIP Fuel Record Books, Volumes I - III
- selected forms and records associated with the procedures UWNR listed below including forms entitled, "Specific Core Component Handling Step for Load XXX (to be filled in by operator) For Critical Experiment"
- UWNR Procedure No. 140, "Procedure for Disassembly of Four-Element Fuel Bundles," Rev. 4, RSC approval dated May 14, 2004
- UWNR Procedure No. 141, "Procedure for Reassembling Fuel Elements into Four-Element Bundles," Rev. 3, RSC approval dated May 14, 2004
- UWNR Procedure No. 142, "Procedure for Measuring Fuel Element Bow and Growth," Rev. 13, RSC approval dated May 14, 2004
- UWNR Procedure No. 143, "Procedure for Fuel Handling and Core Arrangements," Rev. 1, RSC approval dated May 14, 2004
- UWNR Procedure No. 143A, "Core Design," Rev. 2, RSC approval dated May 14, 2004
- UWNR Procedure No. 169, "Annual Maintenance Procedure," Rev. 8, RSC approval dated November 24, 2004

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. 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 and this information was cross-referenced with data recorded on the facility Operating Log Sheets. The inspector verified that the movements were conducted and recorded in compliance with procedure. Fuel locations were recorded on the UWNR 169 forms and in the respective UWNR FLIP Fuel Record Books. Current fuel bundle locations were also maintained on the Fuel Status Board in the Control Room. Comments on the condition of each fuel bundle were noted on the appropriate pages in the Fuel Records Books. The inspector also noted that the latest core configuration, I23-R10, had not been changed for several years.

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 4.3, and the core was arranged as required in TS Section 5.2.

8. Experiments

a. Inspection Scope (IP 69001)

In order to verify that experiments were being conducted in accordance with TS Section 6.8 and within approved guidelines, the inspector reviewed:

- control of irradiated items
- potential hazards identification
- selected forms and records associated with the procedures UWNR listed below
- UWNR Procedure No. 002, "Experiment Standing Operating Instructions," Rev. 11, RSC approval dated May 14, 2004
- UWNR Procedure No. 030, "Experiment Review Questionnaire," Rev. 6, RSC approval dated May 14, 2004
- UWNR Procedure No. 130, "Request for Isotope Production," Rev. 14, RSC approval dated May 14, 2004
- UWNR Procedure No. 131, "Production of Radioisotopes in Nuclear Reactor," Rev. 18, RSC approval dated May 14, 2004
- UWNR Procedure No. 132, "Pneumatic Tube Operating Procedure," Rev. 10, RSC approval dated May 14, 2004
- UWNR Procedure No. 134, "Request and Authorization for Services of the University of Wisconsin Reactor," Rev. 3, RSC approval dated May 14, 2004
- UWNR Procedure No. 135, "Rotator Operating Procedure," Rev. 2, RSC approval dated May 14, 2004
- UWNR Procedure No. 136, "Procedure for Beam Port or Thermal Column Irradiations," Rev. 7, RSC approval dated May 14, 2004

b. Observations and Findings

The inspector determined that one new experiment had been initiated since the last inspection in this area in May 2003. The experiment involved efforts to determine the effects of neutron interaction with supercritical water and to test ways to control oxygen gas (O₂) and hydrogen peroxide (H₂ O₂). The experiment was entitled, "Neutron and Beta/Gamma Radiolysis of Supercritical Water." The inspector verified that the experiment had been reviewed and approved by the Reactor Director (RD) and the RSC as required in the TS. Irradiation authorizations, documented on UWNR 134 forms, had also been reviewed and approved as required.

The inspector noted that the experiments currently approved to be conducted at the facility were classified as "modified routine" experiments. These experiments were required to be conducted under the cognizance of an SRO or the Reactor Supervisor. 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 emergency response actions were being conducted in accordance with UWNR Procedure No. 006, "University of Wisconsin Nuclear Reactor Emergency Plan," Rev. 4, RSC approval dated May 14, 2004 (the licensee's Emergency Plan), the inspector reviewed:

- offsite support 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. 41, RSC approval dated May 14, 2004
- UWNR Procedure No. 150, "Emergency Procedure - Reactor Accident, Fission Product Release, or Major Spill of Radioactive Materials," Rev. 17, RSC approval dated November 24, 2004
- UWNR Procedure No. 151, "Emergency Procedure - Leak Resulting in Draining of Reactor Pool," Rev. 14, RSC approval dated November 24, 2004
- UWNR Procedure No. 152, "Emergency Procedure - Suspected Fission Product Leak," Rev. 14, RSC approval dated November 24, 2004
- 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 November 24, 2004
- UWNR Procedure No. 154, "Emergency Procedure - Theft or Threat of Theft of SNM: Breaching of Security of Reactor Laboratory," Rev. 8, RSC approval dated November 24, 2004
- UWNR Procedure No. 156, "Reactivity and/or Power Level," Rev. 2, RSC approval dated November 25, 2002
- UWNR Procedure No. 157, "Emergency Procedure - Fire, Radioactive Material Spills, Radioactive Dust, Fumes, and Gases; Personnel Injuries Involving Radioactivity; Personnel Overexposures," Rev. 10, RSC approval dated November 24, 2004

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, observed the contents of one of the supply cabinets at the facility. The inspector verified that supplies, instrumentation, and equipment were being maintained, controlled, and inventoried as required in the E-Plan.

Through records reviews 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 being maintained. 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 acceptable.

Emergency drills, including one practice evacuation of the facility per year, had been 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. As noted earlier, a review of facility logs and training records showed that training and classroom instruction had been conducted as required.

The inspector toured the University of Wisconsin Hospital and Clinics Emergency Room (ER) area with the UWNR RD and a hospital representative on May 11, 2005. It was noted that the room and equipment set aside for use during a radiological event appeared to be adequate and in a state of readiness. During the tour the inspector asked about the hospital staff response capabilities in case of an event at the Nuclear Reactor Laboratory. The hospital representative stated that they had the training needed to provide whatever support the UWNR might need in an emergency. The representative also stated that a new emergency decontamination facility was being added to the ER and would be ready by this fall. There appeared to be a good working relationship between the licensee and the hospital.

The inspector and the UWNR RD also visited the Madison Fire Department (MFD), Station No. 4, and spoke with members of that "first responder" organization, as well as with representatives from Station No. 6, a Special Operations/Hazardous Material unit that could respond to the UWNR during an emergency if needed. MFD personnel were very knowledgeable and well equipped to handle fire emergencies at the Nuclear Reactor Laboratory. During the visit, it was noted that various current MFD staff members at Station No. 4 and some of those at Station No. 6 had not had the opportunity to tour the UWNR and become familiar with the facility. The RD took the opportunity to initiate arrangements for such tours to take place. The inspector noted that there had been, and continued to be, good interaction between the personnel at the fire station and the licensee staff.

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 as were the licensee's communications capabilities; 5) semiannual drills and training 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 Previous Open Items

a. Inspection Scope (IP 69001)

The inspector reviewed the actions taken by the licensee following identification of an Inspector Follow-up Item during a previous inspection.

b. Observations and Findings

IFI 50-228/2003-201-01 - Follow-up to verify that two operators' medical examinations were scheduled and conducted as indicated by the licensee.

During an inspection in May 2003, the inspector noted that two reactor operators had had medical examinations (exams) in April 2001 but had not received another exam as of the date of the inspection. Thus, the operators' medical exams were more than one month beyond the biennial limit specified in 10 CFR 55.34. However, they were within the 30-month time period allowed in ANSI/ANS-15.4-1988, "Selection and Training of Personnel for Research Reactors," approved June 9, 1988.

During the current inspection, the inspector followed up on the above situation and reviewed an event report submitted by the licensee to the NRC dated February 18, 2004. The report indicated that one RO had not received a biennial physical exam as required. In May 2003, five licensed operators were instructed to have biennial medical exams. Four of the five operators were able to complete the required exam. The fifth operator was not able to have a physical exam prior to leaving the area for a summer cooperative educational internship in Idaho. (The individual involved was one of the two operators identified by the inspector as not having a current physical exam during the inspection in May 2003). At that time, it was decided to include the physical exam as part of the requalification program that the RO would have to compete upon returning to the facility and prior to resuming licensed activities. Upon returning to the facility in September, an oversight by management, allowed the reactor operator to resume licensed activities without completing the required physical. On February 4, 2004, the licensee discovered that the RO had failed to submit to a physical exam when he had returned to the facility. In the interim, he had resumed licensed activities but a period of 33 months had elapsed between medical exams.

The licensee took immediate corrective actions which included requiring the operator to complete a medical exam. The results of the exam indicated that the operator's medical condition and general health did not adversely affect the performance of assigned duties or cause operational errors. The licensee also required that all licensed personnel obtain a new physical exam to ensure that all operators would have a common medical exam date. In addition, the licensee submitted a change to UWNR Procedure No. 100, "Surveillance Activities Procedure," which included a check off for medical exams to be completed in February of even-numbered years and an audit of the medical exam records in odd-numbered years.

During this inspection, the inspector verified that the aforementioned actions had been completed. Also, the inspector reviewed the medical examination records of the various operators and verified that they all had current examinations and that the examinations were scheduled to be conducted biennially as required. This Inspector Follow-up Item is considered closed.

The licensee was informed that this licensee-identified and corrected violation, involving failure to comply with 10 CFR 55.21 as required, was being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-156/2005-201-01).

c. Conclusions

The issue regarding the completion of two operators' medical examinations was closed. One Non-Cited Violation was identified for failure to comply with the requirements of 10 CFR 55.21.

11. Exit Meeting Summary

The inspection scope and results were summarized on May 12, 2005, 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, Reactor Director
M. Blanchard, Reactor Manager
R. Cashwell, Senior Reactor Operator
E. Edwards, Reactor Operator
T. Johnson, Reactor Operator
S. Luchau, Reactor Operator
J. Murphy, Senior Reactor Operator
B. Schmitt, Reactor Operator

Other Personnel

J. Blanchard, Chairman, Reactor Safety Committee
T. Buchman, Safety and Hazard Control Manager, University of Wisconsin Hospital and Clinics
R. Hansbro, Lieutenant, Madison Fire Department, Station No.4
D. Peterson, Lieutenant, Madison Fire Department, Station No. 6 (HazMat Unit)

INSPECTION PROCEDURES USED

IP 69001 Class II Non-Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-156/2005-201-01 NCV Failure to comply with the requirements of 10 CFR 55.21 in that one RO did not have a physical exam for a period of 33 months.

Closed

50-156/2003-201-01 IFI Follow-up to verify that two operators' medical examinations were scheduled and conducted as indicated by the licensee.

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents and Management System
ADC	Analog to Digital Converter
CFR	Code of Federal Regulations
E-Plan	Emergency Plan
ER	Emergency Room
IFI	Inspector Follow-up Item
IP	Inspection Procedure
LCO	Limiting Conditions of Operation
MFD	Madison Fire Department

MW	Megawatt
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
OPRM	Open Pool Reactor Manual
PARS	Publicly Available Records
RD	Reactor Director
Rev.	Revision
RO	Reactor Operator
RSC	Reactor Safety Committee
SRO	Senior Reactor Operator
TS	Technical Specifications
UWNR	University of Wisconsin Nuclear Reactor