

February 6, 2003

Dr. David K. Wehe, Director
Phoenix Memorial Laboratory
Ford Nuclear Reactor
University of Michigan
2301 Bonisteel Boulevard
Ann Arbor, MI 48109-2100

SUBJECT: NRC ANNOUNCED INSPECTION REPORT NO. 50-02/2003-201

Dear Dr. Wehe:

This letter refers to the inspection conducted on January 6-10, 2003, at the Ford Nuclear Reactor. 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 safety concern was identified. No response to this letter is required.

In accordance with 10 CFR 2.790 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 inspection, please contact Mr. Thomas Dragoun at 610-337-5373.

Sincerely,

/RA/

Patrick M. Madden, Section Chief
Research and Test Reactors Section
Operating Reactor Improvements Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-02
License No. R-28

Enclosure: NRC Inspection Report No. 50-02/2003-201

cc w/enclosure: Please see next page

University of Michigan

Docket No. 50-02

cc:

Special Assistant to the Governor
Office of the Governor
Room 1 - State Capitol
Lansing, MI 48909

Mr. C.W. Becker
Phoenix Memorial Laboratory
2301 Bonisteel Boulevard
University of Michigan
Ann Arbor, MI 48109

Michigan Department of Environmental Quality
Drinking Water and Radiological
Protection Division
P.O. Box 30630
Lansing, MI 48909-8130

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: 50-02

License No: R-28

Report No: 50-02/2003-201

Licensee: University of Michigan

Facility: Ford Nuclear Reactor

Location: Ann Arbor, Michigan

Dates: January 6-10, 2003

Inspectors: Thomas F. Dragoun
Lawrence Berg

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

EXECUTIVE SUMMARY

University of Michigan
Report No: 50-02/2003-201

The primary focus of this routine, announced inspection was the on-site review of selected aspects of the licensee's Class I non-power research reactor operation including: organization and staffing, surveillance and limiting conditions of operations, review and audit, operator requalification, and fuel handling.

Organization and Staffing

- The licensee's organization and staffing remain in compliance with the requirements specified in Technical Specification Section 6.

Surveillance and Limiting Conditions of Operations

- The surveillance program satisfied Technical Specification requirements.

Review and Audit

- The review and audit program satisfied Technical Specification requirements.

Operator Requalification

- Operator requalification was conducted as required by the Requalification Program.

Fuel Handling

- Fuel movement was conducted in accordance with procedural requirements.

REPORT DETAILS

Summary of Plant Status

The licensee's Ford Nuclear Reactor continues to be operated at 2 megawatts in support of laboratory experiments, reactor operator training, and various types of research. During the inspection the reactor was started, operated, and briefly shut down to standby for placement of a sample holder. Since the last inspection in April 2002, the licensee installed a second neutron radiography system at an unused beam port. The safety impact of this change was properly reviewed in accordance with the requirements in revised 10 CFR 50.59 regulation.

In November 2000, the University management stated that the reactor would be allowed to operate for three years. In a press release dated September 26, 2002, the Vice President for Research announced that the reactor will be shut down in July 2003. This announcement, combined with efforts to upgrade physical security, resulted in some reactor operations program, radiation protection program, and equipment improvements to be placed on hold. However, the NRC has not been formally notified that the reactor will cease operation.

The inspector observed that the licensee's security Interim Compensatory Measures were on schedule. These measures will be inspected further during a subsequent NRC inspection.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure [IP] 39745)

The inspector reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of Technical Specification (TS) Section 6.1.6, Amendment Rev 45, dated September 17, 1998, were being met:

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

b. Observations and Findings

Through discussions with licensee representatives, the inspector determined that management responsibilities and the organization at the facility had not changed since the previous NRC inspection of this area in February 2000 (Inspection Report No. 50-02/2000-201). The Health Physicist position, vacant since June 2002, was about to be filled.

During the annual independent audit conducted in October 2002, the auditor reported that staff morale was low due to the announced facility shut down in September. NRC interviews indicated that most of the operations staff was actively seeking other employment. One licensed Reactor Operator (RO) and one trainee had left. However, the remaining staff of nine Senior Reactor Operators (SRO) and three ROs was adequate to support the ten day, three shift reactor operations schedule. Management announced a pay bonus in December 2002, to encourage staff retention.

Inspector interviews with selected operators and observation of daily activities indicated that the decline in morale did not adversely affect attention to safety. The staff continues to maintain professional standards of conduct.

c. Conclusions

The licensee's organization and staffing remain in compliance with the requirements specified in the TS Section 6.

2. **SURVEILLANCE**

a. Inspection Scope (IP 61745)

The inspector reviewed selected aspects of:

- Calibration and Maintenance Procedure (CP) 201, "Shim Safety Rod Calibration," Rev 12 dated February 12, 1997
- CP-202, "Control Rod Calibration," Rev 7 dated February 13, 1997
- CP-203, "Rod Release and Drop Time Measurement," Rev 8 dated October 22, 1995
- CP-205, "Safety System Power Channels A & B Calibration," Rev 5 dated February 18, 1997
- CP-208, "Log Count Rate System," Rev 10 dated July 5, 2002
- CP-301, "Shim Safety Rod Inspection," Rev 10 dated December 13, 1996
- surveillance, calibration and test data sheets, and records

b. Observations and Findings

Surveillances and calibrations required by TS sections 4.1, 4.2, 4.3, and 4.7 were completed at the required intervals during the period January 2001 to-date. The associated procedures: CP-201, CP-202, CP-203, CP-205, CP-208, and CP-301 were available, including applicable checklists, and were approved by the SRC as required by TS 6.4(6). 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 by TS 6.5.1(c). The quarterly calculation of fission density was performed using procedure MP-501, which specified the use of a computer program. The computer program given in Appendix B of MP-501 employed generally accepted calculation techniques. The program implemented the basic nuclear fission reactions given in Appendix A of MP-501 and incorporated measured core flux profile data. The programmer remained on staff.

c. Conclusions

The surveillance program satisfied Technical Specification requirements.

3. REVIEW AND AUDIT

a. Inspection Scope (IP 40745)

The inspector reviewed selected aspects of:

- Safety Review Committee minutes for March 27, 2002, August 8, 2002, and December 4, 2002
- 2002 Annual Audit
- responses to safety reviews and audits
- review and audit personnel qualifications

b. Observations and Findings

Membership and composition of the SRC was as specified in TS 6.2(2). Minutes of meeting demonstrated that the committee met at least semiannually as required by TS 6.2(3) and provided the reviews and oversight specified in TS 6.2(7).

The annual audit by a consultant required by TS 6.2(8) was completed in October 2002. The report was filed on January 16, 2003. However, licensee management had initiated actions regarding the staff morale finding based on the verbal debriefing provided by the auditor.

c. Conclusions

The review and audit program satisfied Technical Specification requirements.

4. OPERATOR REQUALIFICATION

a. Inspection Scope (IP 69003)

The inspector reviewed selected aspects of:

- the Requalification Program
- operator licenses
- operator training and examination records for 2002
- operator physical examination records for 2001-2002
- operator active duty status

b. Observations and Findings

The Requalification Program in effect was Revision 3 dated September 1993. The program was reviewed biennially from the issuance date through 2001 by the NLRM or the Assistant Manager for Reactor Operations in accordance with program requirements. Operator license issue dates and progress in the requalification program demonstrated that twelve operators maintained active status. Biennial physical examinations of the operators were conducted and reported on Form NRC 396. The forms were signed by medical practitioners

licensed by the State of Michigan. Records showed that biennial written and operating examinations of the operators were conducted as required. Content of the examinations was technically challenging and covered the subject matter specified in the NRC approved program. Logs and personnel records showed that operators performed licensed activities and reactor manipulations at the periodicity and for the duration required by the program to maintain active duty status. The inspector noted that there was no training provided during the two year cycle and none was required.

c. Conclusions

Operator requalification was conducted as required by the Requalification Program.

5. FUEL HANDLING

a. Inspection Scope (IP 60745)

The inspector reviewed selected aspects of:

- Management Procedure (MP) 501, "Special Nuclear Material Control And Accountability," Rev 8 dated December 15, 1995
- Procedure AP-301, "Reactor Fuel," Rev 23, effective June 28, 2000
- Procedure OP-201, "Building Checklist," Rev 42, undated
- Fuel movement records for 2001 - 2002

b. Observations and Findings

Fuel movement and fuel examination records and observations showed that the fuel was moved and tested as required. Records and observations also showed that fuel handling and monitoring equipment was operable. Personnel were knowledgeable of the procedural and equipment requirements for criticality control and assurance of fuel integrity. Radiological precautions were also met following applicable Radiation Work Permits.

c. Conclusions

Fuel movement was conducted in accordance with procedural requirements.

6. Exit Interview

The inspection scope and results were summarized on January 10, 2003, with members of licensee management. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

C. Becker, Ford Nuclear Reactor Manager
M. Driscoll, Director, Radiation Safety
B. DuChamp, Assistant Manager, Reactor Operations
J. Lee, Chair, Safety Review Committee
D. Wehe, Director, Michigan Memorial Phoenix Project

INSPECTION PROCEDURES USED

IP 39745	CLASS I NON-POWER REACTORS ORGANIZATION AND OPERATIONS AND MAINTENANCE ACTIVITIES
IP 40745	CLASS I NON-POWER REACTOR REVIEW AND AUDIT AND DESIGN CHANGE FUNCTIONS
IP 60745	CLASS I NON-POWER REACTOR FUEL MOVEMENT
IP 61745	CLASS I NON-POWER REACTOR SURVEILLANCE
IP 69003	CLASS I NON-POWER REACTOR OPERATOR LICENSES, REQUALIFICATION, AND MEDICAL ACTIVITIES

ITEMS OPENED, CLOSED, AND DISCUSSED

Updated

50-02/2001-201-01	IFI	Update health physics procedures. Original target dates were April 2002 for priority procedures and April 2003 for remainder. Project on hold due to shut down announcement.
50-02/2001-202-01	IFI	Verify safety system scram set at 2.45 MW. Two temporary changes were made to the reactor start up procedure OP-101. Changes to be made permanent by March 2003.

Opened

none

Closed

none

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
HP	Health Physics
IFI	Inspector Follow-up Item
IP	Inspection procedure
NRC	Nuclear Regulatory Commission
NRLM	Nuclear Reactor Laboratory Manager
RO	Reactor Operator
SRC	Safety Review Committee
SRO	Senior Reactor Operator
TS	Technical Specifications