

U.S. NUCLEAR REGULATORY COMMISSION  
REGION III

Report No. 50-002/90002(DRP)

Docket No. 50-002

License No. R-28

Licensee: University of Michigan

Facility Name: Ford Nuclear Reactor

Inspection At: Phoenix Memorial Laboratory, Ann Arbor, Michigan

Inspection Conducted: December 5-7, 1990

Inspectors: *A. Dunlop, Jr.*  
A. Dunlop, Jr.

1-2-91  
Date

*P. Pelke*  
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12/27/90  
Date

Approved By: *R. D. Lanksbury*  
R. D. Lanksbury, Chief  
Reactor Projects Section 3B

1/2/91  
Date

Inspection Summary

Inspection on December 5-7, 1990 (Report No. 50-002/90002(DRP))

Areas Inspected: Announced, routine inspection to review records, logs, and organization (39745); review and audit functions (40745); surveillance (61745); fuel handling activities (60745); requalification training (41745); procedures (42745); experiments (69745); periodic and special reports (90713); and licensee event reports (92700).

Results: Of the 9 areas inspected, no violations or deviations were identified.

## DETAILS

### 1. Persons Contacted

#### University of Michigan

- \*R. F. Fleming, Director, Michigan Memorial-Phoenix Project
- \*R. R. Burn, Nuclear Reactor Laboratory Manager
- \*G. M. Cook, Assistant Manager for Reactor Operations
- \*P. Simpson, Assistant Manager, Research Support Activities

\*Denotes those attending the exit meeting on December 7, 1990.

### 2. General

This inspection, which began on December 5, 1990, was conducted to examine the research reactor program at the University of Michigan Ford Nuclear Reactor (FNR). The facility was toured shortly after arrival. The general housekeeping of the facility was good.

The reactor continues to operate on a 10-day operational and 4-day shutdown schedule. There were 16 unscheduled shutdowns for the period January 1, 1990, through October 15, 1990. The unscheduled shutdowns included 4 single rod drops, 1 multiple rod drop, 5 shutdowns due to operator action, no equipment failures, and 6 shutdowns due to offsite power losses.

No violations or deviations were identified.

### 3. Organization, Logs, and Records (39745)

The facility organization was reviewed and verified to be consistent with the Technical Specifications and Safety Analysis Report (SAR). The minimum staffing requirements were verified to be met during reactor operation, and fuel handling or refueling operations.

The reactor logs and records were reviewed to verify that:

- a. Records were available for inspection.
- b. Required entries were made.
- c. Significant problems or incidents were documented.
- d. The facility was being maintained properly.

No violations or deviations were identified.

4. Reviews and Audits (40745)

The licensee's review and audit program records were examined by the inspectors to verify that:

- a. Reviews of facility changes, operating and maintenance procedures, design changes, and unreviewed experiments were performed by a safety review committee as required by the Technical Specifications or SAR.
- b. The review committee and/or subcommittee were composed of qualified members and that quorum requirements and frequency of meetings had been met.
- c. Required safety audits had been conducted in accordance with Technical Specification requirements and that identified problems were resolved.

Since the last inspection, two modifications have been completed: Modification 103, replacement of the Ludlum gaseous activity detectors in the FNR stack and stack No. 2 (exhausts beam port off-gas system, pneumatic tube blower, chemical hood 3103, and Phoenix Memorial Laboratory (PML) exhaust); and Modification 104, replacement of 220 VAC pump and motor control system with a 24 VDC control system. This second modification is the first in a series of control room upgrades. One concern identified by the inspectors was the lack of documentation associated with each modification. For example, the completed modification request forms state tests are required, however, they do not list which tests are required or which tests were performed. The licensee stated that the normal surveillances for the equipment in question were performed. The licensee has agreed to review the modification request form to determine if additional information (tests, installation date) is needed.

A review of SRC meeting minutes indicated that the committee was meeting all requirements.

The inspector reviewed the licensee's audit program. Technical Specification 6.2.8 requires, in part, that a consultant be retained to perform an annual audit of reactor operations and the safety of facility operations. Technical Specification 6.2.9 requires that the consultant (a) audit reactor operations and reactor operational records for compliance with internal rules, procedures, and regulations, and with license provisions including Technical Specifications, (b) audit existing standard operating procedures for adequacy and to assure that they achieve their intended purpose in light of any changes since their implementation, and (c) audit plant equipment performance with particular attention to operating anomalies, reportable occurrences, and the steps taken to identify and correct their causes.

Prior to 1989, the annual audits were performed by McMaster University. The 1989 audit was conducted by the Reactor Supervisor from the University of Lowell (UOL) on June 14-16, 1989. The audit report was not issued until January 21, 1990. The UOL consultant essentially verified that procedures and records were in place for each Technical Specification line item. The inspector verified that the 1989 audit recommendations were resolved by the licensee.

In late 1989, a consultant from Rhode Island Nuclear Science Center (RINSC) assisted the licensee in developing management procedure MP-102, "Nuclear Reactor Laboratory Quality Assurance Audit," which provides a standard format and checklist for the external auditing process. The checklist covers all Technical Specification line items. The licensee plans to use this format for several audit cycles, and then shift the audit process to look at a vertical slice of their activities in more detail. For example, one annual audit may look at the technical adequacy and implementation of several procedures in detail along with an equipment problem. The inspector is concerned that the flexibility in the licensee's planned auditing techniques differs from the explicit guidance provided by Technical Specification 6.2.9. The licensee agreed to consider a Technical Specification change in order to assure that the Technical Specifications reflect their current and planned auditing program. This issue will be tracked as an Open Item (50-002/90002-01).

The UOL performed a 1990 audit on July 12-13, 1990, however, the audit report had not been received as of December 7, 1990. Audit report timeliness was previously discussed in Report No. 50-002/90001 (DRSS). The RINSC performed an audit in October 1990. The inspector reviewed the RINSC report which followed the audit guidance of MP-102.

No violations or deviations were identified.

5. Requalification Training (41745)

The inspectors reviewed procedures, logs, and training records; and interviewed personnel to verify that the requalification training program was being carried out in conformance with the facility's approved plan and NRC regulations.

In 1989, four Senior Reactor Operators (SROs) and two Reactor Operators (ROs) were requalified. Two SROs were exempted from examination, having recently passed the NRC license examination. The 1990 requalification program was not complete at this time and will be reviewed during the next inspection. In a letter dated May 3, 1990, the licensee submitted Revision 2 to the Requalification Program for NRC review and approval. The NRC approved the revised program in a letter dated August 23, 1990.

No violations or deviations were identified.

6. Procedures (42745)

The inspectors reviewed the licensee's procedures to determine if procedures were issued, reviewed, changed or updated, and approved in accordance with Technical Specifications and SAR requirements. This review also verified:

- a. That procedure content was adequate to safely operate, refuel, and maintain the facility.
- b. That responsibilities were clearly defined.
- c. That required checklists and forms were used.

The inspectors determined that the required procedures were available to the operators. The contents of the following selected procedures were reviewed in detail and found to be adequate. The inspectors also reviewed additional procedures that are discussed in Section 7 of this report.

OP-102, "Reactor Shutdown"

OP-105, "Core Excess Reactivity, Shutdown Margin, Control Rod Reactivity, and Verification of Core Negative Reactivity Equal to or Greater than  $[-0.10]$  delta K/K"

AP-301, "Reactor Fuel"

No violations or deviations were identified.

7. Surveillance (61745)

The inspectors reviewed procedures, surveillance test schedules, and test records and discussed the surveillance and preventive maintenance program with responsible personnel to verify:

- a. That procedures were available and adequate to perform tests.
- b. That tests were completed within the required time schedule.
- c. Test records were available.

The following surveillance and maintenance procedures were reviewed:

CP-203, "Rod Release-Drop Time Measurement"

CP-205, "Safety System Calibration"

CP-209, "Calibration Check of Linear Level, Log N, Period, Log Count Rate (LCR) Systems"

CP-212, "Low Flow Scram Verification"

CP-301, "Shim Rod Inspection"

CP-307, "Building Gasket Inspection"



All of the procedures were performed as required by the surveillance/maintenance schedule. Several minor discrepancies were noted with the procedures. Step 7.13 of CP-203 lists incorrect steps to be reperformed to test Rod C. As written the rod would be scrambled before the rod was raised. The inspector verified that Rod C was tested as required. CP-209 requires data to be recorded for LCR Channels 1 and 2 for the calibration check of the LCR system, however, the data sheet blanks are both designated as LCR Channel 1. In addition, the procedure states that the Log N reading from the console meter is not required to be within the required specification (indication only), however, the data sheet did not exclude position 3 from this requirement. The operator when performing the last surveillance did circle an out-of-tolerance reading as required which was reviewed to determine acceptability of the out-of-tolerance reading. The licensee has agreed to revise the procedures to correct the errors.

During the previous inspection it was noted that the licensee did not have a system to track facility deficiencies. The licensee has instituted a system that lists the problem, the date it was discovered, and the date the equipment was returned to service. This list is posted in the control room for easy operator access. This system appears adequate for this facility. The inspector noted during the review of CP-307 that the third floor door gasket for the PML from the FNR was missing a 6 inch piece of material. The comment section on the data sheet stated that the appropriate personnel will be contacted to fix the problem, although there was no final resolution of the issue. This deficiency was not listed on the newly instituted deficiency log. The licensee stated that they will review where the resolution of deficiencies identified during the performance of surveillance/maintenance activities should be appropriately documented.

No violations or deviations were identified.

8. Experiments (69745)

The inspectors verified by reviewing experiment records and other reactor logs that:

- a. Experiments were conducted using approved procedures and under approved reactor conditions.
- b. New experiments or changes in experiments were properly reviewed and approved.
- c. The experiments did not involve an unreviewed safety question, i.e., 10 CFR 50.59.
- d. Experiments involving potential hazards or reactivity changes were identified in procedures.

- e. Reactivity limits were not or could not have been exceeded during an experiment.

No violations or deviations were identified.

9. Fuel Handling (60745)

The facility fuel handling program was reviewed by the inspectors. The review included the verification of approved procedures for fuel handling and their technical adequacy in the areas of radiation protection, criticality safety, Technical Specification, and security plan requirements. The inspectors determined by records review and discussions with personnel that fuel handling operations were carried out in conformance to procedures. Several new fuel assemblies were added to the core since the last inspection. Shipment of spent fuel will be determined pending the availability of the BMI-1 cask owned by Cintichem.

No violations or deviations were identified.

10. Review of Periodic and Special Reports (90713)

The inspectors reviewed the Report on Reactor Operations-1989 for timeliness of submittal and adequacy of information submitted. No problems were noted.

No violations or deviations were identified.

11. License Event Reports (92700)

Through direct observation, discussions with licensee personnel, and review of records, the following event report was reviewed to determine that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications.

(Closed) Reportable Occurrence No. 13: Review of this occurrence is documented in Report No. 50-002/90001(DRSS), Paragraph 4.j.

No violations or deviations were identified.

12. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. An open item disclosed during the inspection is discussed in Paragraph 4.

13. Exit Interview (30703)

The inspectors met with licensee and contractor representatives denoted in Paragraph 1 during and at the conclusion of the inspection on December 7, 1990. The inspectors summarized the scope and results of the inspection and discussed the likely content of this inspection report. The licensee acknowledged the information and did not indicate that any of the information disclosed during the inspection could be considered proprietary in nature.