

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

Docket No: 50-223
License No: R-125
Report No: 50-223/1999201
Licensee: University of Massachusetts
Facility: Research Reactor at University of Massachusetts Lowell
Location: Lowell, Massachusetts
Dates: November 8-10, 1999
Inspector: Thomas F. Dragoun
Approved by: Ledyard B. Marsh, Director
Events Assessment, Generic Communications and
Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

This routine, announced inspection included onsite review of selected aspects of the organizational structure and functions program, design control program, review and audit program, operator requalification program, surveillance program, procedural control program, and Year 2000 readiness since the last NRC inspection of this program.

The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

Efforts to upgrade control room instrumentation and perform maintenance on other instruments indicates a need for assistance from an electronics engineer or technician.

One Non-Cited Violation was identified for incomplete corrective actions for an event described in an August 3, 1999 letter to the NRC.

ORGANIZATIONAL STRUCTURE AND FUNCTIONS

The organization and staffing were consistent with Technical Specification requirements.

DESIGN CONTROL

The design change program satisfied NRC 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. Overdue requirements are being addressed.

SURVEILLANCE

The surveillance program is receiving management attention to ensure timeliness.

PROCEDURES

The procedural control program is receiving management attention to correct minor inconsistencies.

YEAR 2000 COMPUTER CONCERNS

No Year 2000 computer issues were identified that might pose a threat to public health and safety.

Report Details

Summary of Plant Status

During the inspection the reactor was operated occasionally to support service work.

1. ORGANIZATIONAL STRUCTURE AND FUNCTIONS

a. Scope (IP 40750)

The inspector reviewed selected aspects of:

- organization and staffing
- qualifications
- management responsibilities

b. Observations and Findings

The Reactor Supervisor and Chief Reactor Operator are new since the last inspection. Both are fully qualified. The Reactor Supervisor is experienced and was the Facility Director at the Worcester Polytechnic Institute training reactor for several years. Two new staff positions have been added since the last inspection: a Research Physicist and a Research Engineer. The operations staff consists of 7 SRO, 3 RO and 6 trainees, most part time. The number of licensed operators was adequate to support the operations schedule. Staff moral and motivation appeared to be high. A weekly meeting, with formal agenda, of the operations staff, Chief Reactor Operator, and Reactor Supervisor provided effective coordination of activities.

By letter dated August 3, 1999, the licensee reported an unusual event in accordance with TS 6.6(3). The event involved a violation of TS 6.1.5 wherein the on-call SRO was unavailable for approximately 35 minutes during reactor operations. One of the corrective actions, to provide the on-call SRO with a personal electronics communications device (beeper), is incomplete. This matter constitutes a Non-Cited Violation in accordance with Section VII.B.1.h of the NRC Enforcement Policy dated November 9, 1999, as published in the *Federal Register* (64 FR 61142). Completion of the corrective action will be reviewed in a future inspection (Inspector Follow-up Item 50-223/1999201-01)

c. Conclusions

The organization and staffing were consistent with Technical Specification requirements.

2. DESIGN CONTROL

a. Scope (IP 40745)

The inspector reviewed selected aspects of:

- facility design changes and records
- facility configuration

b. Observations and Findings

Records and observations showed that replacement of the nuclear instrumentation channels was acceptably reviewed in accordance with 10 CFR 50.59 and applicable licensee administrative controls.

Additional hardware improvements to the control console are under consideration. Funding would come from industry and DOE. Installation of a new area radiation monitoring system already purchased has been delayed. The Reactor Supervisor stated that these changes are on hold until assistance from an electronics engineer or technician can be arranged.

c. Conclusions

The design change program satisfied NRC requirements.

3. REVIEW AND AUDIT

a. Scope (IP 40750)

The inspector reviewed selected aspects of:

- safety review records
- audit records

b. Observations and Findings

Records showed that the Reactor Safety Subcommittee met quarterly as required and conducted safety reviews. Topics of these reviews were consistent with Technical Specification requirements to provide guidance, direction, and oversight, and to ensure acceptable use of the reactor.

c. Conclusions

The review and audit program satisfied Technical Specification requirements.

4. OPERATOR REQUALIFICATION

a. Scope (IP 41745)

The inspector reviewed selected aspects of:

- the Requalification Program
- operator licenses
- operator training records
- operator physical examination records
- operator examination records
- operator active duty status

b. Observations and Findings

An audit of requalification status by an SRO found that the requalification program was not up-to-date. The most frequently missed requirement was completion of monthly reading. The Reactor Supervisor indicated that training lectures were held but not recorded. A computer-based program was in development to provide easily accessible structured training. Physical examinations of the operators were conducted as required. Logs showed that operators maintained active duty status as required.

c. Conclusions

Operator requalification was conducted as required by the Requalification Program. Overdue requirements are being addressed.

5. SURVEILLANCE

a. Scope (IP 40750)

The inspector reviewed selected aspects of:

- surveillance and calibration procedures,
- surveillance, calibration, and test data sheets and records

b. Observations and Findings

Records of surveillance, test and LCO verifications, and calibrations were being maintained as required. All the recorded results were within the TS and procedurally prescribed parameters. However, an audit by the CRO of surveillance intervals for the four year period between October 1995 and October 1999 found a few intervals that exceeded allowable TS limits. Preliminary corrective action included implementation of a monthly review of surveillance status by the CRO and a quarterly review by the Reactor Supervisor. In addition, forms were created to record surveillances that did not produce data records for filing. The effectiveness of these corrective actions will be reviewed in a future inspection (Inspector Follow-up Item 50-223/1999201-02).

c. Conclusions

The surveillance program is receiving management attention to ensure timeliness.

6. PROCEDURES

a. Scope (IP 40750)

The inspector reviewed selected aspects of:

- administrative controls
- records for changes and temporary changes
- procedural implementation

b. Observations and Findings

Administrative controls of changes and temporary changes to procedures, and associated review and approval processes were as required. A reactor pre-startup equipment check was performed in accordance with the procedure. However, minor discrepancies with other procedures were noted. Records of the control rod worth surveillance (TS 4.1.1) conducted in accordance with procedure SP-15 indicated that a spread sheet program was used to calculate reactivity and plot the rod worth curves. However, procedure SP-15 states that hand calculations are used to calculate reactivity. Procedure SP-16 for measurement of rod drop times requires adjusting the rod drive magnet currents to the values specified in Standing Order 7. The Standing Orders have been eliminated and instead the magnet currents are posted in the control room.

Other operating and surveillance procedures were changed to account for the installation of the new nuclear instrumentation. The Reactor Supervisor stated that the new NI performed all safety functions required by the TS. However, to incorporate an electronic scram, described in USAR section 4.4.15.2, required modification of the circuitry. Delays were experienced due to the unavailability of an electronics engineer. This non-TS feature may require additional changes to the procedures in the future. The Reactor Supervisor stated that these issues will be resolved prior to the HEU-LEU fuel conversion tentatively scheduled for Summer 2000. This matter will be reviewed in a future inspection (Inspector Follow-up Item 50-223/1999201-03).

c. Conclusions

The procedural control program is receiving management attention to correct minor inconsistencies.

7. YEAR 2000 COMPUTER CONCERNS

a. Scope

The inspector reviewed an NRC questionnaire regarding potential Year 2000 computer problems with the Reactor Supervisor. The questionnaire was published in the February 1998 TRTR Newsletter.

b. Observations and Findings

A campus-wide committee is reviewing potential Y2K computer issues. The Reactor Supervisor is the designated individual responsible for the reactor facility. The installed safety system software and hardware have been reviewed or certified as compliant by the vendors. A potential issue was identified with the confinement security system and alternative measures were planned.

c. Conclusions

No Year 2000 computer issues were identified that might pose a threat to public health and safety.

8. EXIT INTERVIEW

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on November 10, 1999. The licensee acknowledged the findings presented.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

L. Bobek, Reactor Supervisor
R. Tooker, Chief Reactor Operator

INSPECTION PROCEDURES

IP 40745 CLASS I NON-POWER REACTOR REVIEW AND AUDIT AND DESIGN
CHANGE FUNCTIONS

IP 40750 CLASS II NON-POWER REACTORS

IP 41745 CLASS I NON-POWER REACTOR OPERATOR LICENSES,
REQUALIFICATION, AND MEDICAL ACTIVITIES

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-223/1999201-01 IFI Provide duty SRO with a beeper.

50-223/1999201-02 IFI Review corrective actions for surveillance intervals.

50-223/1999201-03 IFI Resolve procedure changes.

Closed

none

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
CRO	Chief Reactor Operator
DOE	Department of Energy
HEU	High enriched fuel
IFI	Inspector Follow-up Item
IP	Inspection procedure
LEU	Low enriched fuel
LCO	Limiting condition for operations
NI	Nuclear instrumentation
NRC	Nuclear Regulatory Commission
RO	Reactor Operator
SRO	Senior Reactor Operator
TS	Technical Specifications
USAR	Updated safety Analysis Report
Y2K	Year 2000