

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-223/84-03

Docket No. 50-223

License No. R-125 Priority -- Category F

Licensee: University of Lowell
1 University Avenue
Lowell, Massachusetts

Facility Name: University of Lowell Reactor

Inspection At: Lowell, Massachusetts

Inspection Conducted: July 25-26, 1984

Inspectors: J. D. Swetland
P. D. Swetland, Senior Resident Inspector

5/16/84
date

date

date

Approved by: E. C. McCabe
E. C. McCabe, Chief, Reactor Projects Section
3B

8/16/84
date

Inspection Summary: Inspection on July 25-26, 1984 (Report No. 50-223/84-03)

Areas Inspected: Routine, unannounced inspection by a resident inspector (18 hours) of licensee action on previous inspection findings, facility operation, organization, radiation control, reviews and audits, operator requalification training, and surveillance activities.

Results: Seven areas of licensed activities were inspected. No violations were identified.

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DETAILS

1. Persons Contacted

- *Mr. G. Chabot, Radiation Safety Officer
- *Mr. R. Neault, Chief Reactor Operator
- Mr. P. Perez, Assistant Reactor Supervisor
- *Mr. T. Wallace, Reactor Supervisor

The inspector also contacted reactor operators during the course of the inspection.

*Denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Violation (223/77-02-01): Bomb threat notification procedures. The inspector verified that specific notification requirements have been delineated in the facility security procedures. No further instances of this deficiency have been identified.

(Closed) Unresolved Item (223/78-03-02): The licensee was to implement gross beta self absorption corrections in appropriate facility measurements. The inspector verified that gross beta self absorption correction curves had been generated and were implemented by health physics personnel.

(Closed) Circular (223/79-SC-07): Inform licensees about Scott Air Pack problems. The licensee removed a deficient Scott Air Pack from service and replaced it with a new fully capable respirator.

(Closed) Followup Item (223/83-02-01): The licensee was to evaluate requirements for frisking out of contaminated areas. The licensee has purchased additional monitoring equipment to allow frisking upon leaving each contaminated area. The inspector verified the availability of one monitoring device for this purpose. Delivery of other devices is expected by the end of 1984. The available frisker is utilized for monitoring upon exiting from each contaminated area. No further discrepancies were identified.

(Closed) Followup Item (223/83-02-02): The licensee was to implement documentation of resurveys of decontaminated areas. The inspector verified that health physics personnel were instructed in the proper documentation of decontamination surveys. Licensee contamination survey records currently document survey results before and after decontamination of a work area.

(Closed) Violation (223/83-02-03): The Reactor Safety Subcommittee failed to meet quarterly. The licensee implemented an automatic notification system and instructed the subcommittee members on their responsibility to meet at the established frequency. The inspector reviewed subcommittee meeting minutes and verified that quarterly meetings had been held.

(Closed) Followup Item (223/83-02-04): Inadequate documentation of requalification training. The inspector reviewed requalification program records. Reactivity manipulations completed were summarized in a list for each licensed operator, and annual performance evaluations, describing the reactor operations observed and emergency procedures evaluated, were available.

(Closed) Violation (223/83-02-05): The licensee failed to meet the 13 month surveillance frequency for control rod drive times. The licensee implemented a master surveillance schedule to tickle the requirements for infrequent tests. These schedules are posted and assigned operators/technicians initial the completion of testing for review by the chief reactor operator. Additionally, the completion of surveillance tests are annotated in the reactor log. Control rod drive time tests were completed on December 21, 1983 in accordance with Procedure SP-16, "Rod Drop and Drive Measurements," Revision 3. No further inadequacies were identified.

(Closed) Unresolved Item (223/83-02-06): The licensee and NRC were to resolve the acceptability of the primary coolant flow channel test using system flow as the input signal. Whereas the facility technical specifications (TS) do not require input of a simulated or test signal to verify instrument operability, actual loop flow is considered an acceptable input to the channel to verify system operability. The inspector noted that a channel calibration in accordance with TS 4.2.4 and Procedure SP-12, "Calibration of Flow Measuring Devices," Revision 1, must be performed using independent standards. Therefore, it was determined that the present TS adequately describes the testing requirements.

(Closed) Violation (223/83-02-07): The licensee failed to follow an existing surveillance procedure. Revision 2 to Procedure SP-1, "Calibration of Radiation Monitoring System," was approved on March 1, 1984. The inspector verified that current testing practices were reflected in the new procedure. In addition, the licensee conducted a review of operating procedures to insure they reflect current operations. Necessary revisions identified during this review were also implemented. The inspector had no further questions in this area.

3. Facility Operations

The inspector conducted a tour of the facility upon arrival at the site on July 25, 1984. The reactor was shutdown and an irradiation experiment using the Cobalt 60 source was in progress. During this tour, the inspector verified the correct status of plant conditions and equipment, observed the movement of source material in the pool and observed the conduct of radiation monitor channel tests. The storage of combustibles and general plant cleanliness were evaluated with regard to fire protection and control of the spread of radioactive contamination.

The facility was found to be manned in accordance with Technical Specification requirements, plant logs accurately reflected plant conditions, and operations observed were conducted in accordance with plant procedures.

General plant cleanliness and storage of combustible materials were poor. The dirty floors in presently uncontaminated areas would contribute significantly to the spread of contamination should a radioactive material leak or spill occur. Additionally, cleanup time and the volume of radioactive waste generated by decontamination efforts could be reduced by improved day to day cleanliness.

Combustible packing materials associated with the Cobalt 60 source have been stored in the middle level of the reactor building in the vicinity of plant emergency electrical power distribution equipment. Permanent storage of combustible cleaning materials adjacent to a power distribution box does not meet the plant design objective for control of combustible materials. The licensee's evaluation and corrective action for plant cleanliness and combustible material storage will be followed in a subsequent inspection (223/84-03-01).

The inspector conducted a walkthrough of reactor startup preparation checkouts with licensed reactor operators. Procedure RO-9, "Reactor and Control System Checkout," Revision 6, was found to be technically adequate and operators were knowledgeable of its implementation.

4. Logs, Records, and Surveillance

- a. The inspector reviewed licensee records of plant operations, maintenance, and surveillance testing to verify that:
 - Plant operations were conducted in accordance with Technical Specification (TS) requirements.
 - Significant problems are highlighted and adequately explained.
 - Equipment surveillance is conducted at the assigned frequency.
- b. The following records were reviewed:
 - Reactor log - March 24 through July 25, 1984.
 - Plant operating logs - March, April, and May 1984.
 - Coolant Chemistry logs June 27, July 2 and 11, 1984.
 - Surveillance Results for the 1983-1984 time period.

<u>Procedure</u>	<u>Frequency</u>	<u>TS</u>
Rod Drop and Drive Measurements (SP-16)	13 Months	4.1.2
Visual Inspection of Control Blades and Regulatory Rod (SP-17)	13 Months	4.1.3

<u>Procedure</u>	<u>Frequency</u>	<u>TS</u>
Reactor and Control System Checkout (RC-9)	Daily	4.2
Calibration of Flow Measuring and Temperature Monitoring Devices (SP-12 and -13)	13 Months	4.2.4
Containment Valve Closure Initiation and Time (SP-2)	6 Months	4.4.2
Integrated Leak Rate Test (SP-3)	24 Months	4.4.3
Emergency Exhaust System Test (SP-4)	12 Months	4.4.5
Emergency Generator Surveillance (SP-9)	Monthly/Annually	4.6

c. Findings

The licensee's forms used to record log readings and surveillance test results are not consistent with regard to the inclusion of normal/abnormal reading ranges and acceptance criteria. This information is valuable to the data taker in evaluating the acceptability of the current reading and in early detection of adverse trends. The licensee's procedures and associated Reactor Forms should stand alone such that, upon completion of the form, the tester has verified the acceptability of the results or has brought unusual results to the attention of higher authority.

When instrument setpoints are readjusted, the licensee does not record the as-found data. Therefore, the existence and magnitude of instrument drift are not evaluated and the continuous reliability of the instruments is not demonstrated. The inspector will follow the licensee's inclusion of acceptance criteria and/or operating ranges as well as the inclusion of as-found data and the evaluation of instrument drift on Reactor Forms and in procedures as applicable (223/84-03-02).

5. Organization, Review, and Audit

The inspector reviewed the licensee's organization and found it to be in conformance with Technical Specification (TS) requirements. The incumbents providing management and operational control of the reactor facility remain responsible for safe reactor operations. An assistant to the Reactor Supervisor is onboard and in training for an NRC operator's license.

The inspector reviewed the minutes and records of Reactor Safety Subcommittee meetings on December 20, 1983 and on February 15, March 1, and June 30, 1984. These records documented the licensee's compliance with TS 6.2 as to membership, quorum and meeting frequency, and indicated that the subcommittee had performed its review and audit responsibility. The inspector noted the com-

mittee's desire that an independent audit of reactor activities should be conducted. The Reactor Supervisor has not yet scheduled this audit. This item will be reviewed during a subsequent inspection (223/84-03-03).

6. Radiation Control

The inspector reviewed the licensee's 1984 radiation and contamination survey records as well as the calibration records for radiation survey meters. The adequacy of the survey program, the accuracy of results and the completeness of documentation were evaluated. Two inadequacies were identified:

- The licensee's contamination surveys record the location of all swipes, however, the results of counting of individual swipes is not recorded and only the highest count is summarized. The licensee committed to retain individual swipe count results.
- Radiation survey records were not uniformly annotated with the units of survey, readings, and the serial number of the survey meter used was not recorded. The licensee committed to correct these inadequacies.

The inspector will follow the implementation of licensee corrective action during a future inspection (223/84-03-04).

The inspector reviewed records for radioactive liquid waste discharges made on February 15 and May 9, 1984. A total of 26 microcuries were released. The inspector also reviewed personnel dosimetry records for the period October 1983 to May 1984 to verify that exposure limits had not been exceeded. No inadequacies were identified.

7. Operator Requalification

The inspector reviewed licensed operator training and requalification records including required review of facility changes, evaluation of operator performance, and documentation of reactivity manipulations performed. The inspector reviewed the results of the latest biannual requalification exam. These records verified the completion of the approved requalification program. One candidate for renewal of a reactor operator license in October 1984 was verified to have completed the appropriate aspects of the requalification program. No inadequacies were identified.

8. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on July 26, 1984. The inspectors presented the scope and findings of the inspection. The licensee acknowledged the inspection findings and stated that the storage of combustible material would be reviewed (Paragraph 3); acceptance criteria and observed data would be included in procedures and on reactor forms as applicable (Paragraph 4c); an independent audit of reactor activities would be conducted (Paragraph 5); and, contamination/radiation survey records would be improved (Paragraph 6).