



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

December 17, 2021

Dr. Partha Chowdhury, Director  
Nuclear Radiation Laboratory  
University of Massachusetts-Lowell  
One University Avenue  
Lowell, MA 01854

SUBJECT: UNIVERSITY OF MASSACHUSETTS LOWELL – U.S. NUCLEAR  
REGULATORY COMMISSION ROUTINE INSPECTION REPORT  
NO. 05000223/2021202

Dear Dr. Chowdhury:

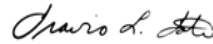
From November 2-4, 2021, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the University of Massachusetts Lowell Research Reactor. The enclosed report documents the inspection results which were discussed on November 4, 2021, with members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records, observed activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390, "Public inspections, exemptions, requests for withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of the NRC's document system (Agencywide Documents Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Phil O'Bryan at 301-415-0266, or by electronic mail at [Phil.O'Bryan@nrc.gov](mailto:Phil.O'Bryan@nrc.gov).

Sincerely,



Signed by Tate, Travis  
on 12/17/21

Travis L. Tate, Chief  
Non-Power Production and Utilization Facility  
Oversight Branch  
Division of Advanced Reactors and Non-Power  
Production and Utilization Facilities  
Office of Nuclear Reactor Regulation

Docket No. 50-223  
License No. R-125

Enclosure:  
As stated

cc: See next page

University of Massachusetts - Lowell

Docket No. 50-223

cc:

Mayor of Lowell  
City Hall  
Lowell, MA 01852

Mr. Leo Bobek  
Reactor Supervisor  
University of Massachusetts - Lowell  
One University Avenue  
Lowell, MA 01854

Department of Environmental Protection  
One Winter Street  
Boston, MA 02108

Jack Priest, Director  
Radiation Control Program  
Department of Public Health  
Schrafft Center, Suite 1M2A  
529 Main Street  
Charlestown, MA 02129

Ms. Samantha Phillips, Director  
Massachusetts Emergency Management Agency  
400 Worcester Road  
Framingham, MA 01702-5399

Test, Research and Training  
Reactor Newsletter  
Attention: Ms. Amber Johnson  
Department of Materials Science  
and Engineering  
University of Maryland  
4418 Stadium Drive  
College Park, MD 20742-2115

SUBJECT: UNIVERSITY OF MASSACHUSETTS LOWELL – U.S. NUCLEAR  
REGULATORY COMMISSION SAFETY INSPECTION REPORT  
NO. 05000223/2021202 DATED: DECEMBER 17, 2021

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NAME	PO'Bryan	NParker	TTate
DATE	11/16/2021	11/16/2021	12/17/2021

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

Docket No.: 50-223

License No.: R-125

Report No.: 05000223/2021202

Licensee: University of Massachusetts Lowell

Facility: University of Massachusetts Lowell Research Reactor

Location: Lowell, Massachusetts

Dates: November 2-4, 2021

Inspector: Phil O'Bryan

Approved by: Travis L Tate, Chief  
Non-Power Production and Utilization  
Facility Oversight Branch  
Division of Advanced Reactors and Non-Power  
Production and Utilization Facilities  
Office of Nuclear Reactor Regulation

Enclosure

## **EXECUTIVE SUMMARY**

University of Massachusetts Lowell  
Research Reactor  
Inspection Report No. 05000223/2021202

The focus of this routine announced inspection was the onsite review of selected aspects of the University of Massachusetts Lowell Research Reactor (UMLRR, the licensee) safety program including: (1) organization and staffing, (2) operations logs and records, (3) requalification training, (4) surveillance and limiting conditions for operation (LCO), (5) emergency planning, (6) maintenance logs and records, and (7) fuel handling logs and records. The U.S. Nuclear Regulatory Commission (NRC) staff determined that the licensee's program complied with NRC requirements.

### Organization and Staffing

- Organizational structure and staffing were consistent with licensee technical specification (TS) requirements.

### Operations Logs and Records

- Operation logs and records were maintained as required by licensee procedures.

### Requalification Training

- Licensed operator licenses, requalification and medical examinations met TS, administrative, and regulatory requirements.

### Surveillance and Limiting Conditions for Operation

- LCO and surveillances were implemented in accordance with TS.

### Emergency Planning

- The emergency planning program was conducted in accordance with the licensee's emergency plan and regulatory requirements.

### Maintenance Logs and Records

- Maintenance activities were conducted in accordance with licensee procedures.

### Fuel Handling Logs and Records

- Fuel movements and inspections were conducted in accordance with TS and procedural requirements.

## REPORT DETAILS

### Summary of Facility Status

The UMLRR is routinely operated in support of educational experiments and demonstrations, research and service irradiations, reactor operator training, and periodic equipment surveillances. During this inspection, the reactor was not operated.

#### 1. Organization and Staffing

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

To ensure that the requirements of TS Section 6.1, "Organization and Management," were met, the inspector reviewed:

- UMLRR radiation laboratory organizational chart
- UMLRR console logbooks
- UMLRR Annual Reports for 2019 and 2020

##### b. Observations and Findings

The inspector found that the UMLRR reactor organization and staffing was consistent with that specified in the TS and that operational staffing met the minimum TS requirements.

##### c. Conclusion

The inspector determined that the licensee's organization and staffing complied with the requirements of TS 6.1.

#### 2. Operations Logs and Records

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

To ensure that the requirements of TS Sections 6.1 and 6.7, "Plant Operating Records," were met, the inspector reviewed:

- UMLRR console logbooks
- UMLRR Annual Reports for 2019 and 2020
- reactor operator instruction forms (RF-RO-7A)
- daily routine check sheets (RF-4)
- pre-startup check sheets – forced convection (RF-RO-7B)

##### b. Observations and Findings

The inspector verified that the procedurally required logbook entries were logged and that the checklists were completed. During the inspection, the inspector observed control blade inspections and verified compliance with the written procedures and TS requirements.

c. Conclusion

The inspector found that logbooks and records were maintained in accordance with TS and procedural requirements.

**3. Requalification Training**

a. Inspection Scope (IP 69001)

To ensure that the requirements of the NRC-approved Operator Requalification Program and applicable regulations were met, the inspector reviewed the following:

- “Operator Requalification Program for the University of Massachusetts Lowell Research Reactor for Licensed Reactor Operators and Licensed Senior Reactor Operators.”
- personnel records (i.e., biennial medical exams and reactor operator requalification exams)
- reactor operator and senior reactor operator operations records

b. Observations and Findings

The inspector found that training was conducted, records were maintained, and medical exams were completed in accordance with regulatory requirements and the licensee’s NRC-approved requalification and training program.

c. Conclusion

The inspector found that operator requalification was conducted as required by the requalification program and regulations.

**4. Surveillance and Limiting Conditions for Operation**

a. Inspection Scope (IP 69001)

To verify that the licensee met the requirements of TS Sections 3.0, “Limiting Conditions for Operation,” and 4.0, “Surveillance Requirements,” the inspector reviewed the following:

- surveillance master schedule
- completed surveillance data sheets
- UMLRR console logbooks

b. Observations and Findings

The inspector found that surveillance tests and surveillances were completed as required by TS and licensee procedures, and that LCOs were satisfied.



c. Conclusion

The inspector found that all surveillances were completed in accordance with TS 4.0 and the licensee complied with the LCO requirements in TS 3.0.

**5. Emergency Planning**

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to verify compliance with the licensee's emergency plan and associated procedures:

- "Emergency Preparedness Plan for the UMLRR," and associated emergency procedures
- biennial training and annual emergency drills
- emergency contact sheet
- emergency closet inventory
- memorandum of understandings with offsite organizations

b. Observations and Findings

The inspector verified that the UMLRR training records, exercise records, staffing requirements, off-site support, emergency equipment maintenance, and emergency plan implementing procedures met the requirements of the UMLRR emergency plan and regulations. Inspector Follow-up Item 05000223/2019201-01, "The UMLRR EP, dated August 2007, contains incorrect information pertaining to uranium-235 fuel enrichment and needs to be updated," was issued during the last NRC inspection of emergency planning in 2019. During this inspection, the inspector verified that the emergency plan was updated with correct information.

c. Conclusion

The inspector found that the licensee maintained its emergency planning program in accordance with its emergency plan and regulatory requirements.

**6. Maintenance Logs and Records**

a. Inspection Scope (IP 69001)

To ensure that maintenance activities were consistent with TS requirements and procedures, the inspector reviewed:

- UMLRR console logbooks
- UMLRR Annual Reports for 2019 and 2020

b. Observations and Findings

The inspector reviewed the maintenance records related to scheduled and unscheduled preventive and corrective maintenance activities that occurred

during the inspection period. The inspector verified that all maintenance was conducted in accordance with the requirements of TS and administrative procedures.

c. Conclusion

The inspector found that maintenance was performed in accordance with TS and licensee procedure requirements.

## **7. Fuel Handling Logs and Records**

a. Inspection Scope (IP 69001)

To ensure the requirements of TS Sections 4.7, "Fuel Surveillance," and 6.7 were met, the inspector reviewed the following:

- UMLRR console logbooks
- current record of all fuel locations in the fuel storage racks
- fuel and control blade inspection records

b. Observations and Findings

The inspector found that fuel handling and inspection activities were controlled in accordance with TS and administrative requirements.

c. Conclusion

The inspector found that fuel handling and inspection activities were completed and documented as required by the TS and licensee procedures.

## **8. Exit Meeting Summary**

The inspection scope and results were summarized on November 4, 2021, with Mr. Leo Bobeck and members of the UMLRR staff. The inspector described the areas inspected and discussed the inspection findings.

## **PARTIAL LIST OF PERSONS CONTACTED**

### **Licensee**

L. Bobek	Reactor Supervisor
D. Lajeunesse	Senior Reactor Operator
R. LaCouture	Senior Reactor Operator
S. Snay	Radiation Safety Officer

## **INSPECTION PROCEDURE**

IP 69001	Class II Research and Test Reactors
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## **ITEMS OPENED, CLOSED, AND DISCUSSED**

### **OPENED**

None

### **CLOSED**

IFI 05000223/2019201-01	"The UMLRR EP, dated August 2007, contains incorrect information pertaining to uranium-235 fuel enrichment and needs to be updated."
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