

UNIVERSITY OF MASSACHUSETTS LOWELL

DOCKET NO. 50-223

UNIVERSITY OF MASSACHUSETTS LOWELL RESEARCH REACTOR

RENEWED FACILITY OPERATING LICENSE

License No. R-125

1. The U.S. Nuclear Regulatory Commission (“the Commission”) has found that:
  - A. The application for renewal of Facility Operating License No. R-125 filed by the University of Massachusetts Lowell (“the licensee”), dated October 20, 2015, as supplemented on November 30, 2016; March 31, July 11, August 7, and September 13, 2017; January 6 and February 1, 2018; March 5, April 10, October 18, October 24, December 19, and December 20, 2019; February 24 and September 30, 2020; and January 30, February 16, April 5, and XX, 2021 (“the application”), complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (“the Act”), and the Commission’s rules and regulations set forth in Title 10, Chapter I, of the *Code of Federal Regulations* (10 CFR);
  - B. Construction of the University of Massachusetts Lowell Research Reactor (“the facility”) was completed in substantial conformity with Construction Permit No. CPRR-87, issued on April 20, 1965, and the application, as amended; the provisions of the Act; and the rules and regulations of the Commission;
  - C. The facility will operate in conformity with the application, as amended and supplemented, the provisions of the Act, and the rules and regulations of the Commission;
  - D. There is reasonable assurance that: (i) the activities authorized by this license can be conducted without endangering the health and safety of the public, and (ii) such activities will be conducted in compliance with the Commission’s regulations;
  - E. The licensee is technically and financially qualified to engage in the activities authorized by this license in accordance with the rules and regulations of the Commission;
  - F. The applicable provisions of 10 CFR Part 140, “Financial Protection Requirements and Indemnity Agreements,” have been satisfied;
  - G. The issuance of this license will not be inimical to the common defense and security or to the health and safety of the public;

- H. The issuance of this license is in accordance with 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," of the Commission's regulations and all applicable requirements have been satisfied; and
  - I. The receipt, possession and use of byproduct and special nuclear materials as authorized by this facility operating license will be in accordance with the Commission's regulations in 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," and 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material."
2. Accordingly, Facility Operating License No. R-125 is hereby renewed in its entirety to read as follows:
- A. This license applies to the University of Massachusetts Lowell pool-type nuclear research reactor (herein "the facility"), owned by the University of Massachusetts Lowell (herein "the licensee"), located on its campus in Lowell, Massachusetts, and described in the licensee's application for license renewal, dated October 20, 2015, as supplemented.
  - B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses the University of Massachusetts Lowell as follows:
    - 1. Pursuant to Section 104c of the Act and 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," to possess, use, and operate the facility as a utilization facility at the designated location in accordance with the procedures and limitations described in the application and set forth in this license.
    - 2. Pursuant to the Act and 10 CFR Part 70, the following activities are included:
      - a. to receive, possess, and use, but not separate, in connection with the operation of the facility, up to 11 kilograms of contained uranium-235 enriched to less than 20 percent in the form of MTR-type reactor fuel;
      - b. to receive, possess, and use, in connection with the operation of the facility, up to 50 grams of plutonium contained in sealed plutonium-beryllium neutron sources;
      - c. to receive, possess, and use, but not separate, in connection with the operation of the facility, up to 100 grams of contained uranium-235 of any enrichment, in the form of neutron detectors, fission plates, foils, and solutions;
      - d. to receive, possess, and use, but not separate, in connection with the operation of the facility, such special nuclear material as may be produced by the operation of the facility; and,
      - e. to receive, possess, and use, but not separate, in connection with the operation of the facility, special nuclear material produced by the

operation of the Worcester Polytechnic Institute Research Reactor (WPIRR), contained in MTR-type reactor fuel transferred from the WPIRR.

3. Pursuant to the Act and 10 CFR Part 30, the following activities are included:
  - a. to receive, possess, and use, in connection with the operation of the facility, one sealed americium-beryllium neutron source containing up to 5 Curies, and one sealed antimony-beryllium neutron source containing up to 10 Curies;
  - b. to receive, possess, and use, in connection with the operation of the facility, up to 20 millicuries per radionuclide, and 50 millicuries total, of radionuclides with atomic numbers 3 through 83, in the form of sealed and/or plated sources;
  - c. to receive, possess, and use, in connection with the operation of the facility, up to 100,000 Curies of cobalt-60, in the form of sealed sources;
  - d. to receive, possess, and use, in connection with operation of the facility, such byproduct material as may be produced by operation of the facility, which cannot be separated except for byproduct material produced in non-fueled reactor experiments; and
  - e. to receive, possess, and use, but not separate, in connection with the operation of the facility, byproduct material produced by the operation of the WPIRR, contained in MTR-type reactor fuel transferred from the WPIRR.
- C. This license shall be deemed to contain, and is subject to, all applicable conditions specified in 10 CFR Parts 20, 30, 40, 50, 51, 55, 70, and 73 of the Commission's regulations; is subject to all provisions of the Act, and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:
  1. Maximum Power Level

The licensee is authorized to operate the reactor at a steady-state power level up to a maximum of 1000 kilowatts (thermal) in accordance with the limitations in the Technical Specifications.
  2. Technical Specifications

The Technical Specifications contained in Appendix A are hereby incorporated in their entirety in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. Physical Security Plan

The licensee shall maintain and fully implement all provisions of the Commission-approved physical security plan, including changes made pursuant to the authority of 10 CFR 50.54(p). The approved physical security plan, entitled "Physical Security Plan for the Protection of Special Nuclear Material of Moderate Strategic Significance at the University of Massachusetts Lowell Research Reactor, Docket # 50-223, License # R-125," designated Revision 9, and dated September 13, 2017, consists of documents withheld from public disclosure pursuant to 10 CFR 73.21.

This license is effective as of the date of issuance and shall expire at midnight, 20 years from the date of issuance. This license shall be implemented within 60 days of issuance.

For the Nuclear Regulatory Commission

Andrea Veil, Director  
Office of Nuclear Reactor Regulation

Attachment:  
Appendix A, Technical Specifications

Date of Issuance: XXX, 2021