



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

May 29, 2020

Mr. John P. Foster, Director
of Reactor Operations
Nuclear Reactor Laboratory
Massachusetts Institute of Technology
138 Albany Street, MS NW12-116B
Cambridge, MA 02139

SUBJECT: MASSACHUSETTS INSTITUTE OF TECHNOLOGY – ISSUANCE OF
AMENDMENT NO. 43 EXTENDING TIME TO IMPLEMENT LICENSE
AMENDMENT NO. 42 TO FACILITY OPERATING LICENSE NO. R-37
(EPID NO. L-2016-LLA-0003)

Dear Mr. Foster:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 43 to Renewed Facility Operating License No. R-37 for the Massachusetts Institute of Technology (MIT) Reactor (MITR). This amendment extends the period to implement License Amendment No. 42, dated December 4, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19123A212), in response to your application, dated April 21, 2020 (ADAMS Accession No. ML20122A062), as supplemented by letter dated May 27, 2020 (ADAMS Accession No. ML20149K414).

Specifically, the amendment authorizes an additional time, i.e., within 180 days after the MITR can resume normal staffing levels due to the relaxation of the Coronavirus Disease 2019 public health emergency restrictions, to implement License Amendment No. 42. License Amendment No. 42, revised License No. R-37 to authorize MIT to upgrade the MITR nuclear safety system by replacing it with a new digital based nuclear safety system. License Amendment No. 42 also authorized revision of the technical specifications, their bases, and the facility Final Safety Analysis Report.

A copy of the NRC staff's safety evaluation is enclosed. If you have any questions, please contact me at (301) 415-3936, or by electronic mail at Patrick.Boyle@nrc.gov.

Sincerely,

/RA/

Patrick Boyle, Project Manager
Non-Power Production and Utilization Facility
Licensing Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities Office of
Nuclear Reactor Regulation

Docket No. 50-020
License No. R-37

Enclosures:

1. Amendment No. 43 to Renewed Facility
Operating License No. R-37
2. Safety Evaluation

cc: w/enclosures: See next page

Massachusetts Institute of Technology

Docket No. 50-020

cc:

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Mr. John Giarrusso, Chief
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Test, Research and Training
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Attention: Ms. Amber Johnson
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Ms. Sarah M. Don, Reactor Superintendent
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138 Albany Street, MS NW12-116B
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SUBJECT: MASSACHUSETTS INSTITUTE OF TECHNOLOGY – ISSUANCE OF AMENDMENT NO. 43 EXTENDING TIME TO IMPLEMENT LICENSE AMENDMENT NO. 42 TO FACILITY OPERATING LICENSE NO. R-37 (EPID NO. L-2016-LLA-0003) DATED: MAY 29, 2020

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ADAMS Accession No.: ML20119A827 *concurred via email NRR-058

OFFICE	NRR/DANU/UNPL/PM*	NRR/DANU/UNPL/LA*	OGC – NLO*
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UNITED STATES
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MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DOCKET NO. 50-020

MASSACHUSETTS INSTITUTE OF TECHNOLOGY REACTOR

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 43
License No. R-37

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to Renewed Facility Operating License No. R-37, filed by the Massachusetts Institute of Technology (the licensee) dated April 21, 2020, as supplemented by letter dated May 27, 2020, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in Title 10 of the *Code of Federal Regulations* (10 CFR) Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public;
 - E. The issuance of this amendment 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
 - F. Prior notice of this amendment was not required by 10 CFR 2.105, "Notice of proposed action," and publication of notice of this amendment is not required by 10 CFR 2.106, "Notice of issuance."

2. Accordingly, the license is amended to authorize the licensee to implement License Amendment No. 42 within 180 days after the Massachusetts Institute of Technology Reactor (MITR) can resume normal staffing levels due to relaxation of the Coronavirus Disease 2019 (COVID-19) public health emergency (PHE) restrictions.
3. In addition, the license is amended to reflect the issuance of this amendment by hereby amending paragraph 2.C.2 of Renewed Facility Operating License No. R-37 to read as follows:

Technical Specifications

2. The Technical Specifications contained in Appendix A, as revised through Amendment 43, are hereby incorporated in the license. The Massachusetts Institute of Technology shall operate the facility in accordance with the Technical Specifications.
4. This license amendment is effective as of its date of issuance and shall be implemented within 180 days after the MITR can resume normal staffing levels due to relaxation of the COVID-19 PHE restrictions.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Greg A. Casto, Chief
Non-Power Production and Utilization Facility
Licensing Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility
Operating License R-37

Date of Issuance: May 29, 2020

ATTACHMENT TO LICENSE AMENDMENT NO. 43

RENEWED FACILITY OPERATING LICENSE NO. R-37

DOCKET NO. 50-020

Replace the following page of the Renewed Facility Operating License No. R-37 with the revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Renewed Facility Operating License

Remove

3

Insert

3

3. Pursuant to the Act and 10 CFR Part 30, to receive, possess, and use:
 - a. a 150-curie antimony-beryllium sealed neutron source in connection with operation of the facility;
 - b. such byproduct material as may be produced by operation of the facility, which, except for byproduct material produced in non-fueled experiments, shall not be separated; and
 - c. byproduct materials activated in reactors other than the MIT reactor (for use in the reactor hot cells) that are in solid form and have atomic numbers 3 through 83. The total inventory of this byproduct material shall not exceed 100,000 curies at any one time. This material may be irradiated in the reactor.
- C. This renewed license shall be deemed to contain and is subject to the conditions specified in Parts 20, "Standards for Protection against Radiation," 30, 50, 51, 55, "Operators' Licenses," 70, and 73, "Physical Protection of Plants and Materials," of the Commission's regulations; is subject to all applicable provisions of the Act and the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified below:

Maximum Power Level

1. The licensee is authorized to operate the reactor at steady-state power levels not to exceed 6.0 megawatts (thermal).

Technical Specifications

2. The Technical Specifications contained in Appendix A, as revised through Amendment 43, are hereby incorporated in the license. The Massachusetts Institute of Technology shall operate the facility in accordance with the Technical Specifications.

Additional Conditions

3. The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The approved physical security plan consists of a Massachusetts Institute of Technology Nuclear Reactor Laboratory document, withheld from public disclosure pursuant to 10 CFR 73.21, entitled, "Physical Security Plan for the M.I.T. Research Reactor Facility," dated July 22, 2013, as revised.



UNITED STATES
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WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 43

RENEWED FACILITY OPERATING LICENSE NO. R-37

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

MASSACHUSETTS INSTITUTE OF TECHNOLOGY REACTOR

DOCKET NO. 50-020

1.0 INTRODUCTION

By letter dated April 21, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20122A062), as supplemented by letter dated May 27, 2020 (ADAMS Accession No. ML20149K414), Massachusetts Institute of Technology (MIT) requested that the implementation deadline in the MIT Reactor (MITR) License Amendment No. 42, dated December 4, 2019 (ADAMS Accession No. ML19123A212), be extended. MIT requested an additional 180 days, after the MITR can resume normal staffing levels due to relaxation of the Coronavirus Disease 2019 (COVID-19) public health emergency (PHE) restrictions.

2.0 EVALUATION

License Amendment No. 42 to Renewed Facility Operating License No. R-37 authorized MIT to upgrade the MITR nuclear safety system (NSS) input to the reactor protection system by the NSS with an upgraded digital based system. The NSS upgrade included replacement of the neutron flux monitoring system and detectors, associated cabling, and safety channels. License Amendment No. 42 also made changes to sections of the safety analysis report and related technical specifications (TSs) to provide consistency with corresponding limiting conditions for operation and surveillance requirements.

Paragraph 3 of Enclosure 1, to License Amendment No. 42 states, "This license amendment is effective as of its date of issuance and shall be implemented within 180 days of issuance."

MIT requested to extend the implementation timeline of the MITR NSS License Amendment No. 42 by an additional 180 days following the relaxation of the COVID-19 PHE conditions that limited facility access by licensed personnel. In its letter, the licensee stated it was not able to complete the steps necessary to implement License Amendment No. 42 since MITR personnel are not permitted to enter campus buildings. The licensee also stated that the state-wide emergency order issued by the Commonwealth of Massachusetts required closure of all physical workspaces and facilities that do not provide designated "COVID-19 Essential Services." As a result of this order, MIT, including its research reactor, are closed (except for essential personnel), the reactor may not operate, and the date for reopening of the MITR is

unknown. MIT requested permission to implement License Amendment No. 42 within 180 days after the MITR can resume normal staffing levels due to the relaxation of the COVID-19 PHE restrictions. MIT also stated that, when normal reactor operations can resume, there may be time sensitive activities, including reactor operator requalification activities, backlogged research activities, and a refueling outage that must be performed before implementation of License Amendment No. 42. License Amendment No. 42 implementation activities include: calibration of the upgraded NSS once the reactor returns to thermal equilibrium, a subsequent maintenance outage to complete NSS wiring changes, and TS required surveillance testing of the NSS prior to restart with the upgraded NSS. MIT indicated that the time extension requested will accommodate the both potential time-sensitive priorities and the implementation activities.

The NRC staff reviewed the licensee's request and determined that an extension of the License Amendment No. 42 implementation date until 180 days after the reactor can resume operations due to the lifting of COVID-19 PHE order is reasonable. The licensee's initial schedule was to implement the NSS upgrade during the maintenance outage planned in April 2020 but cannot be met because of the PHE. The NRC staff finds that the extension, which is needed due to the PHE declaration and Commonwealth of Massachusetts orders issued in March 2020 (e.g., COVID-19 Order No. 13, dated March 23, 2020) that led to and keep the MITR shutdown, would allow the licensee additional time to complete the physical changes to the facility, including the documentation of testing and updating facility records consistent with the safety evaluation, but on a different implementation schedule than authorized by the amendment. The extension of the implementation date would also provide the licensee additional flexibility to implement facility upgrades, and update its records, on a schedule consistent with other time sensitive activities after the end of PHE restrictions. In addition, the NRC staff finds that the extension does not raise any technical or safety concerns because the changing the amendment implementation date does not adversely impact safety of the reactor since the authorized upgrade enhances the NSS.

Because the License Amendment No. 42 implementation date became part of the licensed authority of the facility upon issuance of the amendment, the licensee cannot exceed the implementation date unless the NRC issues an amendment that revises the terms of the amended license. The previous implementation date authorized the licensee the time it requested to implement changes it voluntarily sought to upgrade instrumentation and control equipment to enhance facility operation, but the PHE prevented the licensee from implementing License Amendment No. 42 during April 2020 as planned. The NRC staff finds that extending the implementation date does not adversely affect safety because the reactor is capable of safely operating with the existing NSS input to the reactor protection system. In addition, the NRC staff finds that, there is no regulation that otherwise requires the digital upgrades specified in License Amendment No. 42 to be implemented by a specific date. Therefore, the NRC staff concludes that amending the license to grant the licensee an additional 180 days after the state of emergency has been relaxed so that the MITR can resume operations with normal staffing levels is acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

The NRC regulation, Title 10 of the *Code of Federal Regulations* (10 CFR) 51.22, "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review," paragraph (b), states that no environmental assessment or environmental impact statement is required for any action when the category of action, for which the Commission has declared to be a categorical exclusion by

finding that the action does not individually or cumulatively have a significant effect on the human environment, is met. Because the issuance of this amendment modifies the schedule to implement voluntary upgrades authorized by a previous amendment, it is administrative in nature, changing recordkeeping, reporting or administrative procedures or requirements. In addition, an extension of the implementation date is a minor revision to the license that provides the licensee additional flexibility in scheduling its voluntary upgrade activities. Accordingly, the amendment meets the eligibility criteria for categorical exclusion in 10 CFR 51.22(c)(10)(ii) and (v). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: P. Boyle, NRR

Date: May 29, 2020