



# MIT NUCLEAR REACTOR LABORATORY

AN MIT INTERDEPARTMENTAL CENTER

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24 January 2018

U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attn.: Document Control Desk

Subject: License Amendment Request for Experiment Approval Process Tech Spec,  
Docket No. 50-20, License R-37

The Massachusetts Institute of Technology hereby submits a License Amendment Request (LAR) for its Facility Operating License No. R-37. The requested amendment is for a change in Technical Specification 7.5.2.1 modifying the procedure approval requirements for reactor experiments of a type not previously approved. The reason for this request, as discussed in the enclosed analysis, is to focus the MIT Reactor Safeguards Committee on review and approval of the description and safety evaluation of new experiments that have not been previously reviewed. Review and approval of written procedures for new experiments will be the focus of the Reactor Operations group under the requirements of existing Technical Specification 7.4.

This request has been reviewed and approved by the MIT Reactor Safeguards Committee.

Sincerely,

Edward S. Lau, NE  
Assistant Director of Reactor Operations  
MIT Research Reactor

Alberto Queirolo  
Director of Reactor Operations  
MIT Research Reactor

I declare under penalty of perjury that the foregoing is true and correct.

Executed on January 24, 2018  
Date

  
Signature

EL/t

Enclosure: As stated

cc: USNRC – Senior Project Manager  
Research and Test Reactors Licensing Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

USNRC – Senior Reactor Inspector  
Research and Test Reactors Oversight Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

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Safety Review Form No. 2018-2

Item: Technical Specification 7.5.2.1 (revision to Experiment Review and Approval)

Submitted by E. Lau Date 1/18/2018

Q/A number (required for all equipment changes) 2018-2

	<u>Yes*</u>	<u>No</u>
Does the item change or contradict the Technical Specifications?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Does the item contradict the SAR?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

\*Attach explanation

Description of Change (Attach extra pages if necessary):

See attached.

Safety Evaluation (Attach extra pages if necessary):

See attached.

Summary of Review:

a) Does the proposal:	<u>Yes</u>	<u>No</u>
i) require a license amendment (10CFR50.59(c)(2))	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) decrease scope of requalification program (10CFR50.54(i-1))	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) decrease effectiveness of security plan (10CFR50.54(p))	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) decrease effectiveness of emergency plan (10CFR50.54(q))	<input type="checkbox"/>	<input checked="" type="checkbox"/>

b) Reviewer's Comments:

Reviewer [Signature] Date 1/19/18

Reviewer [Signature] Date 1/19/18

Reviewer [Signature] Date 1/19/18

(Reactor Radiation Protection Officer)

Approved [Signature] Date 1/19/2018

(Director of Reactor Operations)

Date of MITRSC approval if required 1/23/2018/17 Date of NRC approval if required \_\_\_\_\_

List of Communications containing MITRSC additional conditions:

10 CFR 50.59 & 50.54 (p and q) changes included in Annual Report to NRC, Fiscal Year \_\_\_\_\_



Safety Review # 2018-2 – Technical Specification 7.5.2.1Description of Change

Technical Specification 7.5, Experiment Review and Approval, is being amended in section 7.5.2.1 to clarify the experiment review and approval responsibilities of the MIT Reactor Safeguards Committee (MITRSC) to those matters listed in Specifications 7.5.1(a) and 7.5.1(b). The responsibility for review and final approval of written procedures for experiment conduct, as stated in Specification 7.5.1(c), is transferred to the Reactor Operations group.

Specifically, for any experiment of a type not previously approved (i.e. "new experiment"), the MITRSC will review and approve the experiment's written description, safety evaluation, and safety review per requirements described in Technical Specifications 7.4.1 and 7.4.2. For written procedures developed for the conduct of new experiments, the proposed change in Technical Specification (TS) section 7.5.2.1 refers the review and approval responsibilities to the Reactor Operations group, as per requirements under TS 7.4.

Safety Evaluation

The MITRSC is well-populated with technical expertise for review and final approval of written descriptions, safety evaluations and analyses, and safety reviews for reactor experiments of types not previously approved. These reviews will still be performed by the Reactor Operations group and the MITRSC, and the MITRSC will still have the authority to determine final approval. It is only the review and approval for the written procedures for these experiments that will change.

Written procedures for the conduct of new experiments typically cover installation, alarm tests, initial startup, normal and abnormal operational instructions, and removal. The Reactor Operations group has detailed technical knowledge of how these activities should be performed with regard to the reactor. They are therefore well-qualified in the review and final approval of these written procedures. The review and approval will be performed in compliance with TS 7.4. Accordingly, if the Reactor Operations group identifies in the procedures a possible conflict with license conditions, or weakening of the security, emergency, requalification, or ALARA program, then approval of the procedures must be referred to the MITRSC (and possibly to the NRC).

In summary, the proposed change to TS 7.5.2.1 revises and clarifies the responsibilities of review and approval for the MITRSC and the Reactor Operations group. This improves safety by directing the application of knowledge and expertise to the most appropriate areas in the review and approval of new reactor experiments.

### Evaluation of SR#-2018-2 under 50.59 Requirements

The licensee must obtain a Technical Specification amendment for this proposed change, as the existing Technical Specification requires review and approval by the MIT Reactor Safeguards Committee of written procedures for the conduct of experiments which are of a type not previously approved.

### ALARA Determination for SR#-2018-2

This change will have no significant impact on ALARA, as it is purely administrative in nature.

## 7.5 Experiment Review and Approval

### 7.5.1 Review Process

Prior to performing any reactor experiment of a type not previously approved, the proposed experiment or irradiation series shall be evaluated in terms of its effect on reactor operation and the possibility and consequences of its failures, including, where significant, consideration of chemical reactions, physical integrity, design life, proper cooling, interaction with core components, and reactivity effects. This evaluation shall normally consist of the following:

- a) Preparation of an experiment description and safety evaluation by either the experimenter or individual(s) appointed by the Director of Reactor Operations.
- b) Preparation and approval of a written safety review as described in Specifications 7.4.1 and 7.4.2.
- c) Preparation of written procedures for the conduct of the experiment.

Item (a) above may be done as part of item (b) above at the discretion of the Director of Reactor Operations.

### 7.5.2 Approval Process

1. No reactor experiment of a type not previously approved shall be performed until the materials prepared in Specification 7.5.1 (a) and (b) have been reviewed and approved in writing by two licensed senior reactor operators, the Director of Reactor Operations, and the MITRSC. The materials prepared in Specification 7.5.1 (c) shall be reviewed and approved as required by Specification 7.4 (Procedures).
2. Substantive changes to previously reviewed experiments shall require the process described in Specifications 7.5.1 and 7.5.2.1. Minor changes that do



not significantly alter the experiment may be implemented upon the review and approval of a safety review by two senior reactor operators and the Director of Reactor Operations. The safety review shall, as a minimum, describe the change and evaluate its safety.

3. Previously approved experiments may be performed at the discretion of a licensed senior reactor operator without the necessity of any further review or approval.
4. All experiments shall conform to the General Experiment Criteria as given in Specification 6.1.

## 7.4 Procedures

### 7.4.1 Review Process

Prior to the implementation of a new procedure or a change to an existing one, a written safety review shall be prepared that includes the following:

1. A description of the new procedure and/or change to an existing one shall be summarized.
2. A safety evaluation of the new procedure and/or change to an existing one shall be prepared.
3. The new procedure and/or change shall be evaluated to determine if:
  - a) The criteria of 10 CFR 50.59 (c)(1) are not met, or
  - b) The emergency or security plans are affected, or
  - c) The requalification program is affected, or
  - d) The ALARA program is impacted.

### 7.4.2 Approval Process

No new procedure or a change to an existing one shall be implemented until the material prepared in Specification 7.4.1 has been reviewed and approved by two licensed senior reactor operators and the Director of Reactor Operations. Where radiation protection considerations are involved, the review and approval of the MITR-II Radiation Protection Officer, or a designated alternate, shall also be required. Review and approval by the MITRSC is also required for procedures that concern:

- a) The standard operating plan for the reactor including startup and shutdown procedures.
- b) The emergency plan and its implementing procedures.

- c) The security plan and its implementing procedures.
- d) The requalification program.

In the event that the review required by Specification 7.4.1 identifies a situation in which the criteria of 10 CFR 50.59 (c)(1) are not met, or finds that the emergency or security plan is degraded or that the requalification program is weakened or that the ALARA program is negatively impacted, then the proposal must be referred to the MITRSC (and possibly to the NRC).

#### 7.4.3 Scope of Procedures

Written procedures that have been reviewed and approved pursuant to Specification 7.4.1 and 7.4.2 shall be prepared for all operational activities described in the Safety Analysis Report. As a minimum, these include:

- a) Startup, shutdown, and operation of the reactor.
- b) Refueling operations.
- c) Maintenance of components that have nuclear safety significance.
- d) Surveillance and testing as required by these technical specifications.
- e) Personnel radiation protection consistent with applicable regulations or guidelines. These procedures shall include a management commitment and programs to maintain experiments and releases in accordance with the ALARA concept.
- f) Administrative controls for operation and maintenance and for the conduct of irradiations and experiments that could affect reactor safety or core reactivity.
- g) Implementation of required plans such as emergency or security plans.
- h) Use, receipt, and transfer of byproduct material.

#### 7.4.4 Equipment Changes

The review and approval process (Specifications 7.4.1 and 7.4.2) shall apply to changes of equipment that can affect reactor safety.



## 7.5 Experiment Review and Approval

### 7.5.1 Review Process

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- a) Preparation of an experiment description and safety evaluation by either the experimenter or individual(s) appointed by the Director of Reactor Operations.
- b) Preparation and approval of a written safety review as described in Specifications 7.4.1 and 7.4.2.
- c) Preparation of written procedures for the conduct of the experiment.

Item (a) above may be done as part of item (b) above at the discretion of the Director of Reactor Operations.

### 7.5.2 Approval Process

1. No reactor experiment of a type not previously approved shall be performed until the materials prepared in Specification 7.5.1 (a) and (b) have been reviewed and approved in writing by two licensed senior reactor operators, the Director of Reactor Operations, and the MITRSC. The materials prepared in Specification 7.5.1 (c) shall be reviewed and approved as required by Specification 7.4 (Procedures).
2. Substantive changes to previously reviewed experiments shall require the process described in Specifications 7.5.1 and 7.5.2.1. Minor changes that do

not significantly alter the experiment may be implemented upon the review and approval of a safety review by two senior reactor operators and the Director of Reactor Operations. The safety review shall, as a minimum, describe the change and evaluate its safety.

3. Previously approved experiments may be performed at the discretion of a licensed senior reactor operator without the necessity of any further review or approval.
4. All experiments shall conform to the General Experiment Criteria as given in Specification 6.1.