

MIT NUCLEAR REACTOR LABORATORY

AN MIT INTERDEPARTMENTAL CENTER

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6 May 2021

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Re: Massachusetts Institute of Technology, License No. R-37, Docket No. 50-20, Reportable Occurrence 50-20/2021-1: Operation with Less than the Required Staffing on Site; NRC OPS Center Log # EN 55212

Dear Sir or Madam:

The Massachusetts Institute of Technology hereby submits a report of an occurrence at the MIT Research Reactor (MITR) in accordance with paragraph 7.7.2(2) of the Technical Specifications. An initial verbal report was made by telephone to the U.S. Nuclear Regulatory Commission Headquarters Operations Center on Saturday 24 April 2021 at 1705.

The format and content of this report was based on Regulatory Guide 1.16, Revision 1.

1. Report No. 50-20/2021-1; Ops Center Log # EN 55212
- 2a. Report Date: 30 April 2021
- 2b. Date of Occurrence: 24 April 2021
3. Facility MIT Nuclear Reactor Laboratory
4. Identification of Occurrence:

The MIT Research Reactor operated on 24 April 2021 for a time period of about one hour during which there was only one licensed Senior Reactor Operator and an unlicensed trainee present on site. Technical Specification 7.1.3(1) requires that whenever the reactor is not shut down, there shall be at least one SRO and one other licensed operator present on site. The SRO and the trainee were both in the control room throughout this time.

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NRR

5. Condition Prior to Occurrence:

The reactor had been operating at steady-state 5.7 MW throughout Night Shift (0000-0800) on Saturday 24 April 2021 morning.

6. Description of Occurrence:

By 0817, the incoming senior reactor operator (SRO), who would be the reactor duty shift supervisor, had received a turnover from and relieved the outgoing SRO. The incoming SRO proceeded to the reactor control room, received a turnover from and relieved the outgoing console operator from console watch. The outgoing console operator left the reactor site at 0900 without turning console operator duty over to the incoming console operator. The incoming operator, who had forgotten being scheduled to report to the reactor at 0800, arrived at the reactor site at 1000 and went directly to the control room to receive a console turnover from the SRO in the control room. Afterward, the incoming operator telephoned the outgoing operator, and thereby received an official turnover from the outgoing operator.

During the duration without the minimum staffing requirement, the reactor operated at steady state 5.7 MW with no abnormal conditions or alarms. The SRO remained in the control room, while an operator trainee, sufficiently trained to be capable of assisting in response to abnormal operating conditions, was also present in the control room. Furthermore, during the duration, the incoming console operator was available within one mile to the reactor site, and the outgoing console operator was within three miles.

7. Description of Apparent Cause of Occurrence

The outgoing console operator performed a turnover to the incoming SRO but failed to register the need to provide another turnover to the incoming console operator. At 0900, the outgoing console operator perceiving the turnover as having been completed, proceeded to depart from the reactor site. The incoming console operator, misremembering the shift schedule for the day, had not yet arrived on site.

8. Analysis of Occurrence:

The first sentence of Technical Specification 7.1.3(1) states, "When the reactor is not shut down, the minimum crew complement for a shift shall be two licensed operators including at least one licensed senior reactor operator, one of whom shall be in the control room."

The first part of Technical Specification 7.1.3(2) states, "Whenever the reactor is not secured, two persons shall be onsite, one of whom shall be a licensed senior reactor operator. An operator or senior operator shall be present in the control room."

Most licensed staff currently covering weekend shifts are working in non-standard shift patterns, and could have confusion as to shift turnover roles. For instance, the outgoing console operator is a qualified SRO, and may cover a shift as either shift supervisor or console operator. The individual normally covers evening shifts, but was on night shift in this occurrence. The individual may also have fallen into a "slip and capture" mental error scenario between single-turnover and double-turnover pathways, with the distractions including review of a high-priority document with the incoming SRO. Furthermore, the incoming console operator normally covers evening shifts which start at 1600, and on the day of the occurrence had failed to recognize that the scheduled shift would start at 0800. The ongoing COVID-19 public health emergency aggravated this practice of non-standard shift patterns for weekend operation by creating some staffing shortages, as some licensed operators have not yet returned to campus.

There was already a sign posted at the building exit to serve as shift turnover reminder, but its effectiveness decreases over time. A more effective reminder mechanism would allow ready recognition and confirmation of shift coverage and compliance for all outgoing licensed staff as they depart the facility.

9. Corrective Action:

The immediate corrective action, on the day of the occurrence, consisted of the newly-arrived console operator telephoning the outgoing console operator for a shift turnover, as described in Item 6 above.

As a near-term corrective action, a shift coverage and compliance notice board is now installed visible to all outgoing license staff as they depart the facility. This notice board is a magnetic whiteboard (see Figure 1) at the reception desk where the names of the on-duty staff members are to be kept updated by the outgoing shift supervisor and outgoing console operator whenever the building is open.

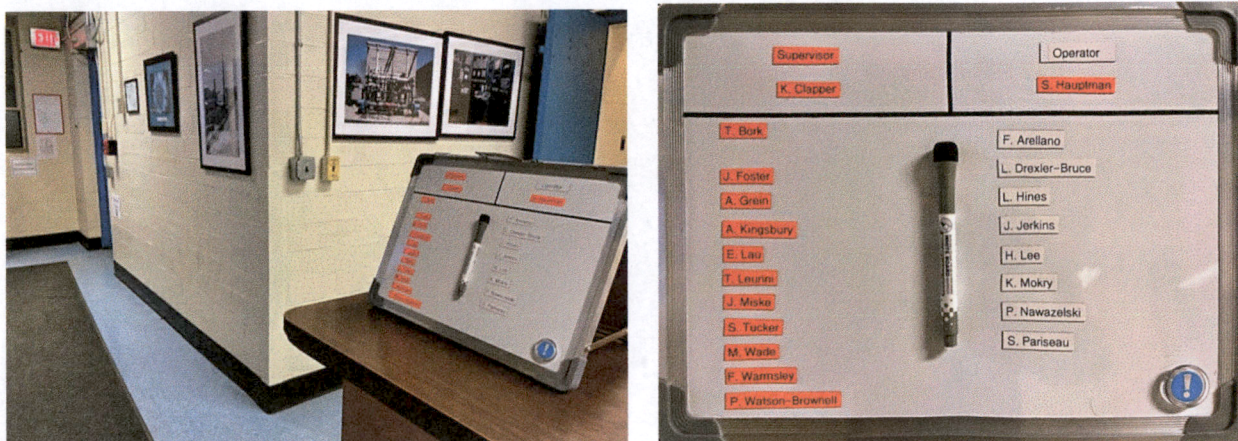


Figure 1 – Two Views of the New Magnetic Whiteboard at Reception Desk


All licensed staff have been advised on the presence and usage of the new notice board.
(Completed 28 April 2021.)


Various engineering solutions which would be more robust are being considered as a possible long-term corrective action.

10. Failure Data

No related occurrences have been documented.

Sincerely,


Marshall B. Wade
Superintendent
MIT Research Reactor



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



John P. Foster
Director of Reactor Operations
MIT Research Reactor

cc: MITRSC

USNRC - Senior Project Manager
Research and Test Reactors Licensing Branch
Division of Licensing Projects
Office of Nuclear Reactor Regulation

USNRC - Senior Reactor Inspector
Research and Test Reactors Oversight Branch
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