

September 16, 2004

CAL No. NRR-03-001

Dr. David E. Moncton, Director  
Nuclear Reactor Laboratory  
Massachusetts Institute of Technology  
138 Albany Street  
Cambridge, MA 02139-4296

SUBJECT: REVISION TO LICENSEE COMMITMENTS – CONFIRMATORY ACTION  
LETTER: MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Dear Dr. Moncton:

This letter responds to your letter of November 25, 2003, which contained a reply to a Notice of Violation (NOV) issued to the Massachusetts Institute of Technology (MIT) on October 31, 2003 (EA-03-155). The NOV was an enclosure to Special Inspection Report No. 50-20/2003-203 dated October 31, 2003, which was conducted to review an occurrence involving an inattentive reactor operator. On July 3, 2003, the Nuclear Regulatory Commission (NRC) issued a Confirmatory Action Letter (CAL) confirming our understanding of actions taken by MIT in response to this occurrence. Your letter of November 25, 2003, proposed changes to some of the CAL actions. The NRC's evaluation of the proposed changes is enclosed. From its evaluation, the NRC staff concluded the following:

1. On the basis that the license of the reactor operator who was inattentive has been terminated, the staff has determined that action 1 of the CAL can be eliminated.
2. The NRC staff has reviewed your proposed changes to CAL action 2 and agrees that positive contact with the operator at the controls approximately every half hour during the day (0800 - 1600) and swing (1600 - 2400) shifts can be discontinued.

Pursuant to Section 182 of the Atomic Energy Act, 42 U.S.C. 2232, you are required to notify me immediately if your understanding differs from that set forth above.

We have reviewed your corrective actions, which appear to be adequate, and have no further questions at this time. These corrective actions will be examined during a future inspection.

Issuance of this revision to the CAL does not preclude issuance of an order formalizing the above commitments or requiring other actions on the part of the licensee; nor does it preclude the NRC from taking enforcement action for violations of NRC requirements that may have prompted the issuance of this letter. In addition, failure to take the actions addressed in this CAL may result in enforcement action.

Dr. D. E. Moncton

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September 16, 2004

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. If you have any questions please contact Alexander Adams at 301-415-1127.

Sincerely,

***/RA/***

David B. Matthews, Director  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Docket No. 50-20  
License No. R-37

Enclosure: As stated

cc: w/enclosure  
See next page

Massachusetts Institute of  
Technology

Docket No. 50-20

cc:

City Manager  
City Hall  
Cambridge, MA 02139

Department of Environmental  
Quality Engineering  
100 Cambridge Street  
Boston, MA 02202

Test, Research, and Training  
Reactor Newsletter  
University of Florida  
202 Nuclear Sciences Center  
Gainesville, FL 32611

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**/RA/**

David B. Matthews, Director  
 Division of Regulatory Improvement Programs  
 Office of Nuclear Reactor Regulation

Docket No. 50-20  
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EVALUATION SUPPORTING REVISION TO LICENSEE COMMITMENTS

CONFIRMATORY ACTION LETTER CAL NO. NRR-03-001

FACILITY OPERATING LICENSE NO. R-37

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DOCKET NO. 50-20

On June 30, 2003, the Massachusetts Institute of Technology (MIT) reported an occurrence to the Nuclear Regulatory Commission (NRC) that involved an inattentive reactor operator at the controls of the MIT Research Reactor. On July 3, 2003, the NRC issued a Confirmatory Action Letter (CAL) to MIT to confirm NRC's understanding of actions taken by MIT in response to this occurrence. The NRC conducted a special inspection to review this occurrence and issued Special Inspection Report No. 50-20/2003-203 on October 31, 2003, which contained a Notice of Violation (NOV) (EA-03-155). By letter dated November 25, 2003, which contained a reply to the NOV, MIT proposed changes to some of the CAL actions. In response to the MIT letter of November 25, 2003, NRC requested additional information concerning the proposed changes to the CAL actions. Additional information was provided to NRC by letters dated February 11, March 31, and May 11, 2004.

Action 1 in the CAL was that the reactor operator who fell asleep at the controls of the MIT Research Reactor will not operate the controls of the MIT Research Reactor without a second licensed operator being present in the control room. By letter dated June 22, 2004, MIT requested that this reactor operator's license be terminated as of June 22, 2004. NRC granted this termination on July 21, 2004. On the basis of the operator's license being terminated, action 1 of the CAL is eliminated.

Action 2 in the CAL was that when a reactor operator is alone at the controls of the MIT research reactor, positive contact will be made with the operator at the controls approximately every half hour. The MIT letter of November 25, 2003, requested that this action be eliminated for the day and swing shifts. This is based on the fact that for day and swing shifts people are not as prone to become inattentive and there is considerable interaction with the control room operator during these hours. For the night shift between 2400-0800 hours MIT proposed an alternative that consisted of the following:

- (i) Current practice is for reactor data to be logged manually every hour. The required data will be separated into two sections with manual entry required for one portion on the hour and the other portion on the half hour. This will provide the operator with mental and physical activity every thirty minutes.
- (ii) A policy of shift rotation every two to three hours will be made normal practice. There may be occasional actions that would preclude this. However, these provide mental stimulation.

- (iii) An audible alarm that has to be reset every 30 minutes has been installed and is in use. In the event of alarm failure, establishment of positive contact with the operator in the control room could be used as a substitute.

In response to a question from the NRC concerning the audible alarm and a recommendation from an independent audit of reactor operations, MIT decided that the benefits of the audible alarm may be outweighed by its drawbacks. MIT requested in their letter of February 11, 2004, that approval be given to discontinue its use. We note that NRC never specifically approved use of the alarm, therefore, approval to discontinue its use is not required.

In response to NRC questions about steps taken by MIT to address the underlying causes of degraded alertness, the MIT letters of March 31 and May 11, 2004, contain the "MITR Operator Alertness Lesson Plan," a training module MIT developed on good practices for shift transaction. This module is part of the MIT reactor operator training program. The module contains a section on employer actions that MIT plans to implement.

The letter of February 11, 2004, discussed a policy under which anyone who is to transit from a day or swing shift to a night shift would have at least 24 hours off duty. However, MIT noted that there may be circumstances under which this might not be possible. Under such circumstances, the Reactor Superintendent will verify with whomever is asked to cover the shift that such person is capable of so doing. If no such person is available, the reactor would be shut down.

The NRC staff has reviewed the proposed changes to CAL Action 2 and agrees that positive contact with the operator at the controls approximately every half hour during the day (0800 - 1600) and swing (1600 - 2400) shifts can be discontinued. Based on your letters to NRC, CAL Action No. 2 is modified to read as follows:

- 2. For the night shift (2400-0800), one portion of reactor data will be logged manually on the hour and the other portion on the half hour. Shift rotation will occur every two to three hours. There may be occasional actions that would preclude this. However, these occasional actions will provide mental stimulation to the reactor operator.

Operator fatigue is most likely to occur on the night shift as opposed to the day or swing shift. The NRC staff concludes that the actions discussed above to stimulate operators on the night shift, the policy on the transit of operators from day or swing shift to night shift, and the MITR Operator Alertness Lesson Plan will minimize the possibility that an operator will be inattentive at the reactor controls.