

July 21, 2000

Dr. John A. Bernard, Director  
Nuclear Reactor Laboratory  
Massachusetts Institute of Technology  
138 Albany Street  
Cambridge, MA 02139-4296

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION (TAC NO. MA6134)

Dear Dr. Bernard:

We are continuing our review of your amendment request for Amended Facility Operating License No. R-37 for the Massachusetts Institute of Technology Research Reactor which you submitted on June 30, 1999, as supplemented. During our review of your amendment request, questions have arisen for which we require additional information and clarification. Please provide responses to the enclosed request for additional information within 30 days of the date of this letter. In accordance with 10 CFR 50.30(b), your response must be executed in a signed original under oath or affirmation. Following receipt of the additional information, we will continue our evaluation of your amendment request.

If you have any questions regarding this review, please contact me at 301-415-1127.

Sincerely,

*/RA/*

Alexander Adams, Jr., Senior Project Manager  
Events Assessment, Generic Communications and  
Non-Power Reactors Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Docket No. 50-20

Enclosure: Request for Additional Information

cc w/enclosure:  
Please see next page

Massachusetts Institute of  
Technology

Docket 50-20

cc:

City Manager  
City Hall  
Cambridge, MA 02139

Assistant Secretary for Policy  
Executive Office of Energy Resources  
100 Cambridge Street, Room 1500  
Boston, MA 02202

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

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REQUEST FOR ADDITIONAL INFORMATION  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY RESEARCH REACTOR  
DOCKET NO. 50-20

1. Page 3, answer 1, the response to 6.5.14 refers to provisions (a)-(d). However, it appears that this section has been renumbered. Does (a)-(d) refer to (i)-(iv) and (e) refer to (v) of your proposed technical specification (TS)? Page 3, answer 1, there are now 20 provisions to Technical specification 6.5, but the table only goes to 19. Please address.
2. Page 6, answer 5, a new senior individual is identified, i.e., the MIT BNCT Principle Investigator, without explaining the qualifications for an individual to have this position. Because this person has direct TS responsibility over the initiation and termination of irradiation of humans, the qualifications of the MIT BNCT Principle Investigator should be added to Technical Specification 6.5 definitions or please justify not having minimum TS qualifications for this position. See also page 12, answer 17(a); page 18 change 1 to TS 6.5; page 19, change B6; QMP page 2, item3(a)(vi); and QMP page 5, item 9.
3. Page 7, answer 7, the selected facility and beam were added to the written directive in a generic reference. To avoid confusion, MIT should provide a distinct name, phrase, or term that uniquely differentiates one BNCT treatment room from the other. These names, phrases, or terms need to be added to the quality management program so that the medical user can provide the correct identification in the written directive. See also page 12, answer 17(e); page 13, answer 17(g)(ii); page 19, change B5; page 6-32, TS definition 10; and QMP page 1, item 3(a)(iii).

It is important to specify that current and accurate beam characteristics are tied to a specific beam and that the beam has to be specified in the written directive. Therefore, please consider revising proposed TS 6.5, Page 6-21, Specification 2 to read, MIT is responsible for providing current and accurate beam characteristic parameters for the identified beam to the medical use licensee and for delivery of the desired fluence from the identified beam as requested in the written directive. Also see QMP page 2, item 3(c).

4. Page 7, answer 7, treatment by the wrong BNCT beam needs to be explicitly added to the definition of a misadministration. Most medical use licensees may not appreciate use of the "wrong mode" captures a misadministration due to the use of the wrong BNCT beam. "Wrong mode" is usually used to distinguish between widely different types of treatment such as receiving teletherapy treatment when requesting linear accelerator treatments or receiving BNCT treatments when requesting teletherapy or linear accelerator treatments. See also QMP page 3, item3(e).
5. Although the cadmium curtain shutter has not been identified as a safety component for human irradiations with the Fission Converter beam, its operation in a partially open position may affect the quality and uniformity of the neutron beam. Describe how you would know that the shutter is in a partially open condition. Describe the effects of the cadmium curtain shutter sticking in a partially open position on the quality and uniformity of the neutron beam delivered to the patient. This discussion should include how changes in quality and uniformity will be observed and what patient treatment actions will be taken if the beam is not predicably uniform.