

December 22, 2004

Mitchell Galanek  
MIT Radiation Protection Programs  
Massachusetts Institute of Technology  
77 Massachusetts Avenue  
N52-496  
Cambridge, MA 02139

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION, LICENSE RENEWAL APPLICATION,  
MATERIALS LICENSE SNM-986 (TAC L31828)

Dear Mr. Galanek:

This letter refers to your renewal application dated April 29, 2004, requesting renewal of Materials License SNM-986.

Our review of your application has identified that additional information is needed before final action can be taken on your request. The additional information, specified in the enclosure, should be provided within 30 days of the date of this letter. Please reference the above TAC No. in future correspondence related to this request.

If you have any questions regarding this matter, please feel free to call me at (301) 415-4025 or via e-mail to [RGL@nrc.gov](mailto:RGL@nrc.gov).

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Please note that on October 25, 2004, the NRC suspended public access to ADAMS, and initiated an additional security review of publicly available documents to ensure that potentially sensitive information is removed from the ADAMS database accessible through the NRC's web site. Interested members of the public may obtain copies of the referenced documents for review and/or copying by contacting the Public Document Room pending resumption of public access to ADAMS. The NRC Public Document Room is located at NRC Headquarters in Rockville, MD, and can be contacted at (800) 397-4209 or (301) 415-4737 or [pdr@nrc.gov](mailto:pdr@nrc.gov).

Sincerely,

/RA/

Robert Lukes, Project Manager  
Fuel Cycle Facilities Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

Docket No.: 70-938  
License No.: SNM-986

Enclosure: Request for Additional Information

December 22, 2004

Please note that on October 25, 2004, the NRC suspended public access to ADAMS, and initiated an additional security review of publicly available documents to ensure that potentially sensitive information is removed from the ADAMS database accessible through the NRC's web site. Interested members of the public may obtain copies of the referenced documents for review and/or copying by contacting the Public Document Room pending resumption of public access to ADAMS. The NRC Public Document Room is located at NRC Headquarters in Rockville, MD, and can be contacted at (800) 397-4209 or (301) 415-4737 or [pdr@nrc.gov](mailto:pdr@nrc.gov).

Sincerely,

/RA/

Robert Lukes, Project Manager  
Fuel Cycle Facilities Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

Docket No.: 70-938  
License No.: SNM-986

Enclosure: Request for Additional Information

DISTRIBUTION:

FCFB r/f                      Region I                      D.Stout

E:\Filenet\ML043570285.wpd  
Concurrence

\*See previous

**ML043570285**

<b>OFC</b>	FCLB		FCLB		FCLB	
<b>NAME</b>	R. Lukes*		J. Muszkiewicz*		J. Lubinski	
<b>DATE</b>	12 /17/04		12 / 21/04		12/ 22/04	

**OFFICIAL RECORD COPY**

**Request for Additional Information**  
**Application Dated April 29, 2004**  
**Massachusetts Institute of Technology**  
**Docket No. 70-938**

Please provide the following information:

1. Provide the technical basis for the change from  $k_{\text{eff}}$  of 0.7 to 0.9. There are two places in the MIT renewal application dated April 29, 2004, that state a  $k_{\text{eff}}$  of 0.9 without a technical justification. Section 4.2.4 states, "Any thermal-to-fast converter that uses the reactor as the thermal neutron source shall be protected from inadvertent criticality: (1) by maintenance of the close packing of the fissile materials to limit the effective multiplication factor ( $k_{\text{eff}}$ ) to less than 0.9 in the event of flooding, and (2) by precluding flooding; both of these highly unlikely and independent contingencies being required before criticality can occur." Also, Section 15.3.3 states that, "Any flux converter using water as a coolant will be configured so that  $k_{\text{eff}}$  under all conditions will be below 0.9." The MIT revised renewal application dated July 11, 1994, states that the  $k_{\text{eff}}$  will be below 0.7. This change has not been previously approved by the Nuclear Regulatory Commission (NRC).

Please submit the following to demonstrate the system is subcritical, for both normal and credible abnormal conditions, with the new  $k_{\text{eff}}$  of 0.9:

- a. Summary of the calculations including critical experiments used, validation results, bias and bias uncertainty; also include the margin/conservatism used in the calculations
- b. Justification for the minimum subcritical margin

10 CFR 70.22(a)(7) states that the license application must contain a description of the equipment and facilities which will be used by the applicant to protect health and minimize danger to life or property and 70.22(a)(8) states that the license application must contain proposed procedures to protect health and minimize danger to life or property. Therefore, there needs to be a docketed technical basis from MIT for reducing the margin of subcriticality for safety (i.e., changing the approved  $k_{\text{eff}}$  from 0.7 to 0.9).

2. Please provide the decommissioning funding plan and the decommissioning plan or justification why each plan does not need to be submitted.

A licensee must determine whether it is required to submit a decommissioning funding plan pursuant to 10 CFR 70.25. Second, a licensee must determine whether to submit a decommissioning plan pursuant to 10 CFR 70.38. On the basis of those determinations, a licensee must submit the appropriate documents, or an explanation of the reasons why the regulations do not apply. MIT erroneously interpreted Regulatory Guide 3.52, Revision 1, which was referenced as "Reg Guide 3.5.2" in its license renewal application, to mean that it was not required to submit financial assurance demonstration for decommissioning costs. MIT reasoned that it would not necessarily

decommission the facilities associated with License No. SNM-986 at the time it terminated that license. MIT asserted that facilities used for activities licensed under SNM-986 are also licensed under its reactor and byproducts materials licenses, and that decommissioning would proceed under those licenses. MIT did not specifically address the requirements of 10 CFR 70.25 and 70.38.

10 CFR 70.25 requires the licensee to submit a decommissioning funding plan, including a decommissioning cost estimate, if its Part 70 license authorizes it to possess radioactive material in unsealed form in excess of threshold limits specified in the regulation. The license authorizes the licensee to possess special nuclear material in unclad and solution form.

10 CFR 70.38 requires the licensee to submit a decommissioning plan, subject to certain conditions.