MIT NUCLEAR REACTOR LABORATORY

AN MIT INTERDEPARTMENTAL CENTER

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May 7, 2008

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

Re: Massachusetts Institute of Technology – Request for License Amendment: Docket No. 50-20; License No. R-37

Dear Sir or Madam:

The Massachusetts Institute of Technology hereby requests an amendment to Technical Specification No. 5.3, "Primary Coolant System." The present wording of that specification stipulates that, "The reactor coolant system shall consist of a reactor vessel, a single cooling loop containing three heat exchangers, and appropriate pumps and valves."

It is requested that this wording be changed to, "The reactor coolant system shall consist of a reactor vessel, a single cooling loop containing one or more heat exchangers, and appropriate pumps and valves."

Background information on this request is as follows. The original (1973) coolant system for the MITR-II reactor contained two heat exchangers. In 1978, it was decided to install a third heat exchanger and License Amendment No. 14 (25 August 1978) was issued. It specified the wording noted in the above paragraph. We now plan to replace all three existing heat exchangers with a single unit. This change is tentatively scheduled for September 2008. Accordingly, we are requesting the needed change in the wording of Specification 5.3.

We note that reactor safety is not a function of the number of heat exchangers. The issue is whether or not the total heat transfer surface area needed for system heat removal is available. The single unit that we propose to install does provide the needed heat transfer area and it also takes advantage of the design advances in heat exchanger technology that have been achieved during the past three decades.

Attached is a copy of the proposed wording of the new specification in its entirety. This new wording will also replace that of Technical Specification 5.2 as submitted as part of the relicensing

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request for the MIT reactor except that the last line of the first paragraph of the basis will refer to Specification No. 3.2.3. Also, the pagination will be different.

Please contact the undersigned with any questions.

Sincerely,

John Bernard, Ph.D, PE, CHP
Director of Reactor Operations

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

Executed on 7 May 08 (Date) _____ (Signature)

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

Senior Reactor Inspector
Research and Test Reactors Branch B
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

5.2 Primary Coolant System

Applicability

This specification applies to the design of the primary coolant system.

Objective

To assure compatibility of the primary coolant system with the safety analysis.

Specification

The reactor coolant system shall consist of a reactor vessel, a single cooling loop containing one or more heat exchangers, and appropriate pumps and valves. All materials, including those of the reactor vessel, which are in contact with the primary coolant (H_2O), shall be aluminum alloys, stainless steel, or titanium alloys except for small non-corrosive components such as gaskets, filters, and valve diaphragms. The reactor vessel shall be designed in accordance with the ASME Code for Unfired Pressure Vessels. It shall be designed for a working pressure of 24 psig and 150 °F. Heat exchangers shall be designed for 75 psig and a temperature of 150 °F. The connecting piping shall be designed to withstand a 60 psig hydro test.

Basis

The reactor coolant system originally consisted of a single loop that contained two heat exchangers. It was subsequently modified to add a third heat exchanger although it was normally operated with only two heat exchangers on line. Most recently it has been changed to contain only one heat exchanger. Core safety is unaffected by the

number of heat exchangers provided that the required heat transfer surface area is available for heat removal and that primary coolant flow remains as required by Specification 3.7.

The materials of construction are primarily aluminum alloy, stainless steel, or titanium alloys and are chemically compatible with the H_2O coolant. The design, temperature, and pressure of the reactor vessel and other primary system components provide adequate margins over operating temperatures and pressures. The reactor vessel was designed to Section VIII, 1968 edition, of the ASME Code for Unfired Pressure Vessels. Subsequent design changes will be made in accordance with the most recent edition of this code.