UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 29 TO

AMENDED FACILITY OPERATING LICENSE NO. R-37

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DOCKET NO. 50-20

1.0 INTRODUCTION

By letter dated February 23, 1996, as supplemented on February 28, 1996, the Massachusetts Institute of Technology (MIT or licensee) submitted a request for an amendment to Amended Facility Operating License No. R-37 for the MIT Research Reactor. The requested change would allow a temporary increase in the possession limit for uranium-235 from 29 kilograms to 41 kilograms until August 8, 1999.

2.0 EVALUATION

The licensee has requested that its license possession limit for uranium-235 be increased on a temporary basis from 29 kilograms to 41 kilograms until August 8, 1999. The Department of Energy Savannah River Operations Office in a letter to MIT dated February 21, 1996 (Attachment 1), told MIT that because of the current receipt schedule and cask utilization, absent an emergency situation, the soonest that fuel could be removed from MIT was April 1998. The licensee predicts that the current possession limit will be reached sometime during the summer of 1996.

Amendment No. 25 to the license dated December 11, 1989, allowed a temporary increase in the license uranium-235 possession limit from 29 kilograms to 41 kilograms until January 1, 1992, for reasons similar to the ones for this request. Amendment No. 26 dated December 9, 1991, extended the temporary possession limit until January 1, 1994. Sufficient fuel was shipped from MIT to allow the temporary possession limit to expire on January 1, 1994. Since that date, the possession limit has been 29 kilograms. The wording of the licensee's request is the same as that approved by the NRC for Amendment No. 25, with the exception of the expiration date.

The possession limit allows for possession of fuel discharged from the reactor, fuel in use in the reactor, and an allowance (1.6 kilograms) for keeping unirradiated fuel on site to maintain operations. The temporary possession limit of 41 kilograms was derived by considering projected operating schedules, anticipated experimental usage, operating experience with the fuel cycle, need for excess reactivity, and technical specification

constraints on fission density. The practice at MIT is to keep the amount of uranium-235 on site to a minimum and to maximize fuel depletion. The staff agrees with MIT's estimate of the increase in possession limit.

The requested changes to the license will not require changes in the "Physical Security Plan for the M.I.T. Research Reactor Facility" because the fuel is self protecting (≥ 100 R/hr at 3 feet). Storage of spent fuel will be in existing storage facilities, which have the capacity to hold the fuel discharged from the reactor during the period this amendment is in effect. Criticality aspects of fuel storage at MIT that were addressed by Amendment No. 21 issued on May 28, 1982, are not changed by this amendment.

The possession limit requested is similar to the limit previously approved by the NRC staff. The 41-kilogram limit is temporary and will be in effect until August 8, 1999. While the 41-kilogram temporary possession limit is in effect, MIT will submit information on the status of the establishment of shipping capability and other activities relevant to the amendment as part of its required annual report to the NRC.

Therefore, because (1) past possession of up to 41 kilograms of uranium-235 at MIT has been acceptable, (2) possession will be in accordance with the technical specifications and the security plan, and (3) the need to request an increase in possession limit is due to events beyond the control of the licensee, the staff concludes that increasing the possession limit of uranium-235 to 41 kilograms until August 8, 1999, is acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves changes in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that this amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released off site, and no significant increase in individual or cumulative occupational radiation exposure. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The staff has concluded, on the basis of the considerations discussed above, that (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously evaluated, or create the possibility of a new or different kind of accident from any accident previously evaluated, and does not involve a significant reduction in a margin of safety, it does not involve a significant hazards consideration; (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed activities; and (3) such activities will be

conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or the health and safety of the public.

Principal Contributor: A. Adams, Jr.

Date: April 8, 1996

ATTACHMENT 1

Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

FEB 21 1996

Dr. John Bernard
Director of Reactor Operations
Massachusetts Institute of Technology
Nuclear Reactor Lab
138 Albany Street
Building NW 12
Cambridge, Massachusetts 02139

Dear Dr. Bernard:

SUBJECT: Shipment(s) of Spent Nuclear Fuel (SNF) to the Savannah River Site (SRS)

On Wednesday, February 14, 1996, Mr. Tom Newton of your staff contacted SRS regarding the possibility of making one or more shipments of SNF from the Massachusetts Institute of Technology (MIT) to SRS for storage during 1996. Upon receipt of this inquiry, a review of SRS's current receipt schedule and shipping cask utilization was conducted to determine if SRS could support such a request.

As you are aware, there is only one shipping cask that is small, light weight, and licensed by the Nuclear Regulatory Commission for use by universities - the BMI-1 cask. Because of the transit times and loading and unloading times required for the BMI-1 cask, it is typically not possible to make more than two shipments per month with that cask. This constraint coupled with SRS's cask receipt capacity (three domestic casks per month) make it impossible for MIT to ship SNF to SRS in the BMI-1 cask during 1996 without delaying other planned shipments.

A review of planned shipments for 1996 was also performed to determine if any could be delayed without significant impact to their programs or facilities. The U.S. Department of Energy (DOE) is committed to the completion of the program for converting the majority of University research reactors to low enriched uranium and the removal of the highly enriched uranium from those campuses. Almost half of the shipments scheduled for the BMI-1 cask are directly related to this effort. In addition, DOE will likely resume shipments of government-owned SNF at SRS in the next few months. At that time, the reactor at the National Institute of Standards and Technology will be shipping SNF to SRS for the first time in about seven years. Unfortunately this facility cannot be delayed in their shipment schedule because of facility utilization and the fact that they have less than one year of margin before they must shutdown from a lack of SNF storage capacity.

Absent an emergency situation at MIT, SRS cannot support receipt of SNF from MIT during 1996. The present schedule shows three shipments of SNF from MIT in April and May 1998. If this schedule causes significant impact on your facility from a safety and health perspective or from an operational or financial perspective, please notify us. We will work with you and your staff to reach a mutually agreeable shipping schedule. MIT is recognized as one of SRS's regular customers and we wish to cooperate with you on future shipments to the maximum extent possible.

If the SNF storage situation at your facility changes and becomes more urgent or if the urgency of your current situation is greater than presented above, please contact me immediately so that we can work with you to develop a solution.

If you or your staff have any questions or require additional information on receipt plans and capabilities, please contact me at 803-557-3759.

Sincerely,

W. D. Clark, Manager
Spent Nuclear Fuel Program

RSFD:WDC:gis

cc: B. K. Chambers, RSFD
G. W. Stout, PAI