



KENNETH A. SMITH
ASSOCIATE PROVOST AND
VICE PRESIDENT FOR RESEARCH

CAMBRIDGE, MASSACHUSETTS 02139
(617) 253-1973

April 27, 1990

50-20

U. S. Nuclear Regulatory Commission
Att: Document Control Desk
Washington, D.C. 20555

Subject: Submission of Decommissioning Report, 10 CFR 50.75(d)
MIT Research Reactor, Facility License R-37

Gentlemen:

Pursuant to 10 CFR 50.33(k)(2), which requires a report to the Commission on or before July 26, 1990, indicating how reasonable assurance will be provided that funds will be available to decommission its research reactor, Massachusetts Institute of Technology submits the enclosed Decommissioning Funding Report for the MIT Research Reactor, providing the information required by 10 CFR 50.75(d):

- a) a cost estimate for decommissioning the facility,
- b) assurance in the form of a certification that decommissioning funds will be available,
- c) a description of the means of adjusting the cost estimate periodically over the life of the facility.

With regard to item (b) above and pursuant to 10 CFR 50.12, the Institute requests an exemption from the list of acceptable methods provided in 10 CFR 50.75(e)(2). Reasons for the request are stated in the report.

We believe that the report fulfills the requirements of 10 CFR 50.75 as applicable to the MIT Research Reactor.

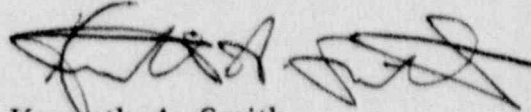
9005030271 900426
PDR ADDOCK 05000020
PDC

A020
11

April 27, 1990
Page 2

Please address any questions concerning this matter to Professor Otto K. Harling, Director, MIT Nuclear Reactor Laboratory.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'Kenneth A. Smith', with a stylized, cursive script.

Kenneth A. Smith

KAS/mw

Enclosure: Decommissioning Funding Report

cc: Prof. Otto K. Harling

DECOMMISSIONING FUNDING REPORT
July 26, 1990 (or earlier)
Massachusetts Institute of Technology Research Reactor
Facility Operating License No. R-37

This report has been prepared for the U.S. Nuclear Regulatory Commission by the Massachusetts Institute of Technology pursuant to 10 CFR 50.33(k)(2).

1. Cost Estimate for Decommissioning

Based on NRC's proposed rule-making published in the Federal Register on February 11, 1985, (50 FR 5600) and in anticipation of the final NRC rule published June 27, 1988, (53 FR 24018) addressing decommissioning planning needs and the assurance of the availability of decommissioning funds, MIT employed General Electric Company (GE) to conduct a study to estimate the cost of ultimately decommissioning the MIT Research Reactor. The study was conducted during the FALL of 1988 by GE Nuclear Energy, Advanced Nuclear Technology Decommissioning Projects; and a report, "Conceptual Decommissioning Plan and Cost Estimates," was submitted to MIT in December 1988 (and slightly revised in Revision 1, dated 1/11/89). A copy of the report is attached.

GE's cost estimate for decommissioning (i.e., reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of the license) is \$9,072,000 in 1988 (4th quarter) dollars. The decommissioning concept is DECON, i.e., that "method in which the equipment, structures and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations."

Assumptions used are given in Table 1 of the GE report, one of which is that all fuel and control blades will have been removed from the site prior to start of the decontamination work. Also not included in the cost estimate is the demolition of the reactor containment building, the exhaust ventilation stack and the cooling towers, which are believed to be only insignificantly contaminated, if at all. It was also assumed that site release limits will be based on NRC's "Guidance for Termination of Non-Power Reactor Facility License," Rev. 1, dated 9/15/84, and NRC Regulatory Guide No. 1.86, "Termination of Operating Licenses for Nuclear Reactors." It is noted in the NRC Draft Regulatory Guide (May 1989) that further guidance on residual radioactivity is being developed for publication by the NRC staff. The potential impact of changes in the release criteria are not known at this time.

Because GE's cost estimate was based on 1988 (4th quarter) dollars, it has been updated to June 1989 for purposes of this report, by means of the following adjustment factor: $F = 0.89L + 0.11B$, where L is an escalation factor for labor and is taken from regional data of the U.S. Department of Labor's Bureau of Labor Statistics, and B is an escalation factor for waste burial and is taken from NUREG-1307. The weighting factors for B and L are the fractions of the total cost estimate represented by burial costs ($\$962,000/\$9,072,000 = 0.11$) and by all other costs ($\$8,110,000/\$9,072,000 = 0.89$) in GE's cost estimate.

The base value for L [corresponding to the 1988 (4th quarter) GE estimate] is taken from the Monthly Labor Review, currently Table 25, "Employment Cost Index, Private Nonfarm Workers," subtitled "Compensation." The Northeast value for December 1988 was 150.4. The latest available index is 155.5 (June 1989), giving $1.0339 (=155.5/150.4)$ as the value of L for that date.

The base value for B (also corresponding to the 1988 (4th quarter) GE estimate) is 1.581, which is taken from NUREG-1307 and is an average escalation factor for PWR's and BWR's for 1988 for the South Carolina burial site relative to the Washington site, which was taken in NUREG-1307 as 1.000 in 1986. This is the latest available index value, but annual updates are expected to become available and will be used for annual calculations of the adjustment factor, i.e., $B = \text{latest index}/1.581$ (currently the latest value of the index is 1.000).

The adjustment factor for June 1989, relative to GE's 1988 (4th quarter) base, becomes $1.0302 (= 0.89 \times 1.0339 + 0.11 \times 1.0000)$, giving $\$9,346,000$ as the value of the cost estimate as of June 1989, based on the latest available data (i.e., June 1989 for L and December 1988 for B).

2. Assurance That Decommissioning Funds Will Be Available

Paragraph 75(e)(2) of 10 CFR Part 50 stipulates that, for licensees other than electric utilities, acceptable methods of providing financial assurance for decommissioning include, "in the case of Federal, State, or local government licensees, a statement of intent containing a cost estimate for decommissioning, and indicating that funds for decommissioning will be obtained when necessary."

There are 47 universities operating or owning non-power reactors (plus four more possessing critical assemblies). All but four of the reactors (MIT, WPI, Cornell University, and Reed College) are state-owned. Hence, in most cases, a statement of intent by an authorized individual qualifies as an acceptable method of providing financial assurance for decommissioning.

MIT contends, for the reasons below, that a statement of intent by the Institute should also qualify as an acceptable method. For this purpose, it requests an exemption from the list of acceptable methods as provided in paragraph 50.75(e)(2), i.e. prepayment, external sinking fund and/or surety or other guarantee method, and requests that the Commission recognize this report as a certification that funds for decommissioning will be made available when necessary.

The following brief description of the Institute's financial status supports such a certification. Included is information regarding the Institute's total assets, total liabilities, net worth, operating income and expenses, and also other revenues. Data is from the Institute's Report of the Treasurer for the Year Ending June 30, 1989 (attached hereto), which also contains an "Auditor's Report."

Balance Sheet 6/30/89 (Schedule C)

Total assets (investments at cost)		\$1,582,824,000
Total liabilities	\$ 227,178,000	
Net worth	<u>1,355,646,000</u>	1,582,824,000

Statement of Current Operations

Year Ending 6/30/89 (Schedule A)

Operating expenses		\$ 947,175,000
Operating revenue and funds	\$ 935,870,000	
Additional funds used	<u>11,305,000</u>	947,175,000

Total Gifts, Grants and Bequests (Section II) \$ 78,408,000

Trends in the Institute's financial status are positive, as may be seen by consulting appropriate portions of the Treasurer's Report, such as Schedule E, which shows steadily improving fund balances over a ten-year period. Furthermore, the Institute's ability to raise additional capital when needed has been demonstrated in recent years by successful conduct of its "Leadership Campaign, 1975-1980, which raised \$250,000,000, and its current "Campaign for the Future," which has raised over \$450,000,000 against an initial goal of \$550,000,000.

This evidence of financial viability should serve as justification for the granting of an exemption from the requirements of 10 CFR 50.75(e)(2).

3. Future Adjustments to Cost Estimate

The method described in (1) above for escalating GE's 1988 cost estimate to \$9,346,000 will be used in a similar manner annually for updating the cost estimate.

- Attachments:
- 1) General Electric Nuclear Energy, "Conceptual Decommissioning Plan and Cost Estimates," Rev. 1 (1/11/89).
 - 2) Report of the Treasurer for the Year Ending June 30, 1989.