# **Decommissioning Cost Information**

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from the

Massachusetts Institute of Technology

**Research Reactor Facility** 

Docket 50-20

License No. R-37

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#### Duke Engineering & Services.. A Duke Encry Company

#### **EXECUTIVE SUMMARY**

Massachusetts Institute of Technology (MIT) contracted Duke Engineering and Services (DE&S) to perform an update of the decommissioning cost estimate (DCE) for the MITR-II research reactor facility. The report fulfills the following requirements of the agreement between DE&S and MIT:

- Work Breakdown Structure (WBS) of the entire project.
- Project schedule
- Project cost and resource estimates
- Summary Report

The MITR-II DCE is not an update of the 1989 Conceptual Decommissioning Plan and Cost Estimates, provided by General Electric Nuclear Energy. Instead, the MITR-II DCE is a "bottoms-up" cost estimate that uses current industry experience and bid preparation practices. The cost estimate physical inventory is developed from site walk-downs and data gathering, combined with material take-off compiled from the data acquisition activities. Using proven cost estimating techniques and employing the aide of industry professionals, as well as expertise from the MIT research team, the cost estimate, including contingency, is reliable to within +/-25% of actual expected decommissioning cost expenditures. Depending on the timing and the manner in which the decommissioning project is managed, the expected cost of the overall decommissioning may be 25% lower than that reported herein, or 25% greater than that reported.

The resulting DCE is the result of a team approach to estimating the current cost to decommission MITR-II. The MIT Nuclear Reactor Laboratory provided technical support to DE&S throughout the cost estimating process. The team met on four separate occasions throughout the ten-week duration of the project. MIT staff provided DE&S with over two hundred drawings of the facility as well as financial operating costs, essential to the complete accounting of all expected costs for the future decommissioning of the facility. The team conducted a number of site walk-downs and photographed all accessible areas. MIT provided the team with photographs of inaccessible areas that also proved to be useful in developing the inventory for the DCE.

The DCE provides MIT with a baseline estimate to use for the eventual decommissioning planning and execution. By no means does this report suggest MIT's strategy on decommissioning MITR-II, nor does it represent a fixed price bid for contracted activities. The study represents one probable decommissioning scenario considering the current physical state of the facility.

The DCE for MITR-II is expected to take approximately five years to complete. A project schedule is presented in the backup material for this report. A number of inefficiencies are built into the schedule to reflect periods of inactivity while waiting for both NRC approval of the decommissioning plan, and MIT's anticipated effort to offload fuel from the site. The actual hands-on portion of the decommissioning is estimated to take approximately one year, with a one-year pre-planning period and eighteen months of final status survey and facility closeout. The estimated cost to decommission MITR-II, in mid-year 2001 dollars is \$20.9 million, without contingency. Based on the conservatism that is built into the DCE, a contingency of 10% should be applied to this baseline estimate for a total DCE of \$23.0 million.

## DECOMMISIONING COSTS DUKE ENGINEERING STUDY 2001 Based on 2000 costs

ACTIVITY COST SHEET		PROPOSED COST SHEET 2005 A		PROPOSED COST SHEET 2005 B	
Labor	11,452,207	Labor	11,452,207	Labor	11,452,207
Travel	529,408	Travel	68,115	Travel	529,408
Equip/Material	3,565,650	Equip/Material	3,565,650	Equip/Material	3,565,650
On-Site Contractor	5,397,251	On-Site Contractor	-	On-Site Contractor	5,397,251
Total	20,944,517	Total	15,085,973	Total	20,944,517
contingency 10%	2,094,452	contingency 10%	1,508,597	contingency 10%	2,094,452
Grand Total	23,038,969	Grand Total	16,594,570	Grand Total	23,038,969
		CPI-U Index	113.2	CPI-U Index	113.2
		2005 TOTAL	18,785,054	2005 TOTAL	26,080,113

### Notes

Proposal 2005 A

1. Travel reduced to clean-up shipment costs

2. On-site contractor not needed if work is done by resident staff

3. CPI-U index for 2005 based on 2000 CPI-U index = 100

Proposal 2005 B

1. All costs based on 2000 costs using CPI-U escalator

## seg8/29/05