THE UNIVERSITY OF MICHIGAN
REGENTS COMMUNICATION

ACTION REQUEST

Approved by the Regents
January 17, 2008

Subject: Ford Nuclear Reactor Decommissioning Project

Action Requested: Approval of Revised Budget

Background:

In October 2000, the University decided to cease operations at the Ford Nuclear Reactor (FNR). In February 2004, the Ford Nuclear Reactor Decommissioning Project was approved by the Regents with an estimated budget of $9,800,000. Decommissioning a research nuclear reactor is a very complex process that requires, first and foremost, protection of public health throughout the process. Special worker protection and environmental monitoring procedures must also be continuously maintained. The U. S. Nuclear Regulatory Commission (NRC) requires strict adherence to detailed regulations requiring removal or reduction of radioactivity to a level that will allow termination of the license and unlimited re-use of the facility. In addition, very specific procedures are followed for the transportation of waste materials to prevent environmental contamination as these materials are disturbed and removed from the facility. Nuclear reactor operations and other high-energy physics experiments had been conducted in the FNR building since 1957.

Since October 2000, the following significant milestones have been achieved:

July 2003	Reactor operations ceased permanently
Fall 2003	Fuel shipped to the U. S. Department of Energy
February 2004	Regents Approval to Proceed with the Ford Nuclear Reactor Decommissioning Project
Spring 2004	Decommissioning plan submitted to NRC for review/approval
November 2005	Decommissioning contractor selected
June 2006	NRC approved decommissioning plan and project work began
October 2006	High-level activated metal removed and shipped to the designated off-site NRC-approved disposal facility
October 2007	Last remaining significant structures removed including the pool walls and floor
December 2007	Completed last waste shipment. Over 2 million pounds of waste shipped

Upcoming milestones in 2008, subject to NRC review:

- Submit final status survey plan to NRC for review
- NRC confirmation survey
- Complete final status survey and submit to NRC for approval
- NRC termination of license follows satisfactory completion of the above

The project has been successful thus far in terms of safety, health, and shutdown of reactor operations. These goals were of the utmost importance of any of the project goals.

However, the total costs will exceed the approved budget by $4.6 million. The degree of budget uncertainty at the outset of the project was much higher than a typical capital project due to the unusual and unknown circumstances associated with deconstructing a major facility with residual radioactivity in a manner where protection of public and worker health is of utmost importance. Two major activities have driven the cost above the estimated budget. Concrete removal of the old reactor pool walls and floor has been an integral part of the project in order to make the facility as useable in the future as possible. This process involved cutting approximately 10,500 cubic feet of high density concrete into manageable size blocks for shipping to the disposal site in Utah. The concrete cutting activities took substantially more effort than originally anticipated. The impact

was primarily due to embedded components in the concrete. Other decommissioning activities were planned and scheduled around the anticipated cutting production rate and were in turn impacted by the slowed rate. Examples of conditions encountered include embedded capped pipe containing lead shot, piping and conduit locations that differed from the original design, and movement of structural materials within the concrete during the cutting. These conditions affected both productivity and wear and tear on the equipment. The added time and effort to perform the concrete cutting are estimated at $1.75 million.

Waste disposal costs exceeded estimates as well. Low-level radioactive waste required disposal at an approved facility, and there is only one in the country, located in Clive, Utah. At the time of project inception, the waste quantity estimates could only be based on what was known at the time and not on what field conditions might reveal as removal of the structure was underway. Disposal costs were based on market conditions at the time. Since the time of the original budget estimates, the one disposal facility remaining in the country purchased competitors in the industry and expanded their operations, and at the same time raised rates. In addition, as the project progressed we discovered that the contractor bid for the project did not account for the cost of rigging the concrete blocks at the point of loading onto rail cars for shipment. The waste rigging, shipping, and disposal costs for the project have increased from the original budget estimate by approximately $1.1 million.

In addition to the major impacts described above, a number of lesser impacts to the project have resulted in additional costs, including increased oversight, decreased productivity, and general personnel costs associated with delays, adding approximately $1.15 million to the project budget. These included addressing field conditions for the thermal column assembly, requirements of the American Nuclear Insurance company that is also reviewing this project in detail, draining of the reactor pool water, electrical systems, and general delays as the project progressed. Finally, since the project decommissioning is being performed under strict NRC regulations and oversight, every activity and process used requires extensive documentation for NRC review. Every time an adjustment to the project was made due to finding unknown conditions, project documentation required revisions and all project personnel had to be retrained to the new procedures. All of this was essential to ensure the safety and health of the workers and protection of the general public and the environment.

The original project budget approved by the Regents was $9.8 million. The impacts and changes noted above account for approximately $4 million in additional costs to the project. We have also included $600,000 for contingencies, bringing the anticipated estimate for the project to $14.4 million. Surprises we may encounter through conclusion, unexpected NRC findings or rulings, or unexpected events could, however, impact the project going forward. All major demolition, decommissioning, waste transport and disposal has been completed and the overall risk for additional changes is predominantly behind us.

The revised estimated cost of the project is $14,400,000. Funding will be provided from investment proceeds. The construction cash flow may be provided, all or in part, by increasing the commercial paper issuance under the commercial paper program, secured by a pledge of General Revenues, and authorized by the Regents. Construction is scheduled to be completed in Winter 2008. Sometime after the project has been completed, we will return with an action request for the renovation of the space formerly occupied by the Ford Nuclear Reactor.

We recommend that the Regents approve the revised budget for the Ford Nuclear Reactor Decommissioning Project.

Respectfully submitted,

Timothy P. Slottow
Executive Vice President and
Chief Financial Officer

January 2008