Critical Decision-4, Approve Start of Operations or Project Completion for the Modernization of Laboratory Facilities Project at the Oak Ridge National Laboratory

Office of Safety, Security, and Infrastructure
Office of Science

A. PURPOSE

The purpose of this paper is to document the review by the Office of Science (SC) Energy Systems Acquisition Advisory Board-equivalent for the Critical Decision (CD), "Approve Start of Operations or Project Completion (CD-4)" for the Modernization of Laboratory Facilities (MLF) project at the Oak Ridge National Laboratory (ORNL).

B. MISSION NEED

The mission of the Science Laboratories Infrastructure Program within SC is to support the conduct of Departmental research missions at SC laboratories by funding line item construction to revitalize and repair the general-purpose infrastructure.

ORNL is the Department of Energy's (DOE's) largest multi-program science laboratory. Six core competencies underpin activities at ORNL.

- Neutron Science.
- Leadership Computing and Simulation Science.
- Energy Engineering Sciences.
- Advanced Materials and Interfacial Chemical Processes.
- Biological and Environmental Systems.
- Science and Technology for National Security.

For the past seven years, ORNL has applied substantial resources to modernize its facilities and infrastructure to ensure continued support of the science mission in these areas. Today, many of ORNL's scientific facilities are new or have been recently upgraded. However, this is not the case for facilities housing our materials and chemical sciences organizations, the Chemical Sciences and Materials Science and Technology Divisions. Research programs affected by this acquisition include the following:

- Chemical Transformations at Interfaces (e.g., catalysis, corrosion).
- Synthesis Science for Materials by Design.
- Materials Under Extreme Conditions.
- Science to Energy.
- Biological Mass Spectrometry.
- Separation Science.
- Geochemistry.
- Chemical and Materials Characterization.

The current building space housing these programs, the 4500 North and South Complex, is aged and difficult to maintain. As a result, the science operations of these research groups are already being affected by the functionality of the old, deteriorating building facilities. The condition of the building threatens the viability of several research programs and no longer adequately supports DOE's mission accomplishment. Frequent failures of the utility systems that support the Labs result in lost time and inefficiencies during research experiments. It is a deterrent in attracting and retaining scientific staff. Immediate action to house programs in modern, reliable laboratory space is required.

C. PROJECT SCOPE BASELINE

The facility is located on a site formerly used for parking (Flagpole Parking Lot) adjacent to Building 4500 North. The scope of the project includes design and construction of a new facility at ORNL, installation of standard laboratory equipment, and testing, checkout, and commissioning of the facility. The facility will consist of 120,000-160,000 gross square feet (gsf) of laboratories, office, and support space with a minimum baseline requirement of 120,000 gsf. The total size of the completed facility is 160,427 gsf, which delivers33.7 percent more space than the minimum scope requirement.

D. PROJECT COST BASELINE

The Total Project Cost is $96.3 million. Table 1 shows the funding profile for this project. The funding necessary to complete this project was provided prior to the beginning of any construction.

Table 1 – Funding Profile ($000)

Fiscal Year	Total Estimated Cost		Other Project Costs	Total Project Cost
	Project Engineering and Design	Construction		
Prior Years			700	700
2008	6,000	3,329	400	9,729
2009		25,103	100	25,203
2009 ARRA		60,568		60,568
2010		0		0
2011			100	100
TOTAL	**6,000**	**89,000**	**1,300**	**96,300**

The project Level 1 Milestones are shown in Table 2. CD-4 was completed six months ahead of the baseline date of December 2011.

Table 2 – Project Milestones

CD-0	Approve Mission Need	September 2007 (A)
CD-1	Approve Alternative Selection and Cost Range	January 2008 (A)
CD-2	Approve Performance Baseline	December 2008 (A)
CD-3A	Approve Start of Construction – Early Construction Package and Long Lead Procurements	May 2009 (A)
CD-3B	Approve Start of Construction – New Laboratory Building	August 2009 (A)
CD-4	Approve Project Completion	June 2011 (A)

CD-4 was completed six months ahead of the baseline date of December 2011.

E. ENERGY CONSERVATION AND SUSTAINABLE DESIGN

MLF was designed to comply with 10 CFR 435, as well as DOE Order 430.2B. Decisions regarding the planning, acquisition, sitting, designing, building, operating, and maintaining of this proposed facility are based on the DOE Guiding Principles of High Performance and Sustainable Buildings. New equipment and systems were selected to maximize energy efficiencies and "green" building technologies. The MLF project has as one of its overall goals to achieve Leadership in Energy and Environmental Design (LEED) certification. The project is on track to achieve LEED Gold certification and the building energy model is 30.2 percent more efficient than the ASHRAE 90.1-2004 Energy Cost Budget baseline building.

F. INDEPENDENT READINESS CONFIRMATION

Operational readiness documentation and acceptance testing, commissioning, and readiness activities were reviewed and satisfactorily verified as part of the readiness process. Other documents reviewed and issued included a transition to operations plan a final hazards analysis report a draft Project Closeout Report, and Environmental Management System documentation An Independent Peer Review team was organized to confirm that the MLF was ready for safe operation and to obtain CD-4. The Peer Review Team report was presented to the Acquisition Executive during the Independent Project Review conducted on June 8, 2011.

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Submitted by:

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Johnny O. Moore — 6/20/11 — Date

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Recommendations:

The undersigned "Do Recommend" (Yes) or "Do Not Recommend" (No) approval of CD-4, for the Modernization of Laboratory Facilities project as noted below.

ESSAB Secretariat, Office of Project Assessment	Date 6/23/11	Yes ✓ No____
Representative, Non-Proponent SC Program Office	Date	Yes____ No____
Representative, Office of Budget	Date 6/23/11	Yes ✓ No____
Representative, Environmental, Safety, and Health Division	Date 6/23/11	Yes ✓ No____
Representative, Safeguards and Security Division	Date	Yes____ No____
Representative, Facilities and Infrastructure Division	Date 6/23/11	Yes ✓ No____
Representative, Grants and Contracts Division	Date	Yes____ No____

Approval:

Based on the information presented above and at this review, Critical Decision-4, Approve Operations or Project Completion, is approved and authorization is provided to proceed to project closeout.

Marcus E. Jones, Associate Director — Date 6/23/2011
Office of Safety, Security, and Infrastructure
Office of Science, SC-31, HQ/GTN