

# MEL-001 – Science Laboratories Infrastructure Project, Various Locations

(Changes from FY 2003 Congressional Budget Request are denoted with a vertical line in the left margin.)

## 1. Construction Schedule History

Fiscal Quarter				Total Estimated Cost (\$000)	Total Project Cost (\$000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		

N/A -- See subproject details

## 2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
<b>Project Engineering &amp; Design (PED)</b>			
FY 2002	3,183 <sup>a</sup>	3,183	2,385
FY 2003	3,355 <sup>b</sup>	3,355	3,573
FY 2004	2,000	2,000	2,080
FY 2005	0	0	500
<b>Construction</b>			
Prior Years	10,879	10,879	2,672
FY 2002	18,613	18,613	12,262
FY 2003	28,226	28,226	27,445
FY 2004	29,936	29,936	31,900
FY 2005	28,489	28,489	29,400
FY 2006	0	0	12,464

<sup>a</sup> Title I and Title II Design funding of \$880,000 (Subproject 18); \$803,000 (Subproject 17); and \$1,500,000 (Subproject 25) provided under PED Project No. 02-SC-001.

<sup>b</sup> Title I and Title II Design funding of \$1,710,000 (Subproject 27); \$1,100,000 (Subproject 28); \$545,000 (Subproject 33) requested under PED Project No. 03-SC-001.

### 3. Project Description, Justification and Scope

This project funds two types of subprojects:

- Projects that renovate or replace inefficient and unreliable general purpose facilities (GPF) including general use, service and user support facilities such as administrative space, cafeterias, utility systems, and roads; and
- Projects to correct Environment, Safety, and Health (ES&H) deficiencies including deteriorated steam lines, environmental insult, fire safety improvements, sanitary system upgrades and electrical system replacements.

General Purpose Facilities Projects:

a. Subproject 15 – Laboratory Facilities HVAC Upgrade (ORNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
7,100	500	3,000	3,600	0	0	3Q 2002 – 2Q 2004

This project will provide improvements to aging (average 38 years old) HVAC systems located throughout the 13 buildings which comprise ORNL's central research complex, thereby improving the research environment and reducing operations and maintenance costs. Work will include: 1) installation of a primary/secondary Central Chilled Water Plant pumping system by replacing existing inefficient primary and booster pumps with a variable volume distribution system and 2-way chilled water control valves; 2) installation of a chilled water cross-tie to Buildings 4501/4505 from the underground tie-line between Buildings 4500N and 4509 to address low capacity problems; 3) upgrading of a corroded hot water reheat distribution system which supplies reheat water for zone control of the primary air handlers; 4) upgrade of deteriorated air handlers in selected buildings with new filters, steam and chilled water coils, and controls; 5) installation of new chilled water coils and chilled water supply piping for the east wing of Building 3500 to replace the refrigerant system that has high maintenance requirements; and 6) replacement of control valves in various buildings to improve system efficiency.

b. Subproject 18 – Laboratory Systems Upgrades (PNNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
9,000	0	880 <sup>a</sup>	4,000	4,120	0	2Q 2003 – 2Q 2005

This project will upgrade or replace 20-50 year old mechanical system components in eight high occupancy facilities, replacing them with more efficient and better performing systems to enhance the quality of science while reducing maintenance and energy costs. This upgrade will include: replacement of HVAC supply and exhaust fans; replacement, rehabilitation or modification of numerous chemical exhaust fume hoods; installation of computerized, remote, digital controls on various systems to improve operations.

<sup>a</sup> Title I and Title II Design funding provided under PED Project No. 02-SC-001.

c. Subproject 25 – Research Support Center (ORNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
16,100	0	1,500 <sup>a</sup>	5,000	9,600	0	2Q 2003 – 2Q 2005

This project will construct a 50,000 sq. ft. facility to house the core support service facilities and serve as the cornerstone and focal point of the East Research Campus envisioned in the ORNL Facility Revitalization Project. This building will include an auditorium and conference center (currently there is no adequate auditorium/conference space available at ORNL), cafeteria, visitor reception and control area, and offices for support staff. It will facilitate consolidation of functions, which are presently scattered throughout the Laboratory complex in facilities that are old (30-50 years), undersized, poorly located, or scheduled for surplus. The facility will serve as a modern center for meeting, collaborating, and exchanging scientific ideas for ORNL staff and nearly 30,000 visitors, guests, and collaborators that use ORNL facilities each year. The new cafeteria will replace the existing cafeteria, which was constructed in 1953. The existing cafeteria is poorly located to serve the current staff and is adjacent to the original production area of the laboratory now undergoing decontamination. The estimated simple payback is seven years.

d. Subproject 27 – Research Support Building, Phase I (BNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
18,200	0	0	3,250 <sup>b</sup>	5,150	9,800	2Q 2004 – 3Q 2006

This 55,000 sq. ft. facility is intended to consolidate Staff Services, Public Affairs, Human Resources, Credit Union, Library and other support functions in a central quadrangle to provide staff and visiting scientists with convenient and efficient support. This facility, the first of four phases in the BNL Master Revitalization Plan, will include a lobby with a visitor information center to assist visiting scientists, and a coordinated office layout of related support services. After completion of this project, 23,000 sq. ft. of World War II era structures will be torn down. Based on total life-cycle costs, productivity gains, avoided energy and maintenance costs, the Research Support Building will provide a return on investment of 14.4% and a simple payback of 9 years.

<sup>a</sup> Title I and Title II Design funding of \$1,500,000 provided under PED Project No. 02-SC-001.

<sup>b</sup> Title I and Title II Design funding of \$1,710,000 requested under PED Project No. 03-SC-001.

e. Subproject 28 – Building 77 Rehabilitation of Structures and Systems, Phase II (LBNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
13,360	0	0	1,757 <sup>a</sup>	2,000	9,603	3Q 2004 – 2Q 2006

This project will provide for rehabilitation to correct mechanical, electrical and architectural deficiencies in Buildings 77 (a 39 year old, 68,000 sq. ft. high-bay industrial facility) and 77A (a 14 year old, 10,000 sq. ft. industrial facility). Both buildings house machine shop and assembly operations in which production of highly sophisticated research components for a variety of DOE research projects is performed. Current work includes precision machining, fabrication and assembly of components for the Advanced Light Source, the Dual-Axis Radiographic Hydrodynamic Test Facility (DAHRT) project, the Spallation Neutron Source, and the ATLAS Detector. Infrastructure systems installed by this project will include HVAC, power distribution, lighting, and noise absorption materials. The improvements are necessary to satisfy urgent demands for high levels of cleanliness, temperature and humidity control, and OSHA and reliability requirements. This is the second of two projects; the first project, funded in FY 1999 and completed in FY 2002, corrected structural deficiencies in Bldg. 77.

f. Subproject 33 – Continuous Electron Beam Accelerator Facility (CEBAF) Center Addition, Phase I (TJNAF)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
10,500	0	0	1,500 <sup>b</sup>	3,914	5,086	1Q 2004 – 1Q 2006

This project is Phase I of three phases to provide for additions to the CEBAF Center office building. The purpose of the three phases is to provide additional critical computer center space and to eliminate off-site leases and existing trailers to collocate staff for enhanced productivity. This first addition will add 59,000 sq. ft. of computer center (7,600 sq. ft.) and office space and eliminate 22,000 sq. ft. of aging trailers with a 7.4-year simple payback and a 10% rate of return. Phase I will provide additional space for 182 users and 50 staff personnel.

ES&H Projects:

a. Subproject 09 - Fire Safety Improvements, Phase IV (ANL-E)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
8,381	6,351	2,030	0	0	0	3Q 2001 - 2Q 2003

This project will complete the effort of correcting known deficiencies with respect to fire detection and alarm systems; life safety and OSHA related sprinkler systems; and critical means of egress in twenty-eight (28) buildings at the Argonne National Laboratory-East (ANL-E) site. Correction of these deficiencies is required to comply with DOE Order 420.1, OSHA 1910,164, and OSHA Subpart C. These deficiencies, if uncorrected, could result in unmitigated risks of injury to

<sup>a</sup> Title I and Title II Design funding of \$1,100,000 requested under PED Project No. 03-SC-001.

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personnel and/or damage to DOE property in case of fire.

b. Subproject 12 - Site-wide Water Distribution System Upgrade (LBNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/Completion Dates</u>
8,300	1,000	4,400	2,900	0	0	2Q 2002 – 1Q 2004

This project will rehabilitate the Laboratory’s High Pressure Water (HPW) System that supplies over 100 facilities at LBNL. The HPW System provides domestic water, fire water, treated water, cooling tower water and low conductivity water. It consists of 9.6 km of pipe (1.4 km of cast iron pipe, 6.3 km of ductile iron pipe, and 1.9 km of cement lined coated steel pipe), associated valves, pumps, fittings etc. and two 200,000 gallon emergency fire water tanks. This project will: replace all cast iron pipe, which is in imminent danger of failing, with ductile iron pipe; electrically isolate pipe and provide cathodic protection; replace leaking valves and add pressure reducing stations to prevent excessive system pressure at lower laboratory elevations; add an emergency fire water tank to serve the East Canyon; and provide the two current emergency fire water tanks with new liners and seismic upgrades.

c. Subproject 13 - Groundwater and Surface Water Protection Upgrades (BNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/Completion Dates</u>
6,050	1,889	2,763	1,398	0	0	2Q 2002 - 1Q 2004

This project will implement a backlog of ground and surface water protection projects that are commitments to regulators. These include: proper closure of inactive supply and injection wells; runoff control for the surplus material storage yard; containment and runoff control for the radioactive material storage yard; replacement of 12 hydraulic elevator cylinders; removal of 22 underground fuel oil tanks; and other Suffolk County Article 12 upgrades.

d. Subproject 14 - Fire Protection Systems Upgrades (ORNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/Completion Dates</u>
5,920	584	3,120	2,216	0	0	3Q 2002 – 4Q 2004

This project will upgrade the 36 year-old fire protection system with improved, more reliable fire alarm capabilities by: replacing deteriorated, obsolete systems; replacing the single 16-inch water main in the east central section of ORNL with a looped system (4,000 lf of 16 inch pipe); and by extending coverage of automatic alarm systems to areas not previously served. New fire alarm equipment will provide emergency responders with greatly improved annunciation of the causes and locations of alarms and will provide code compliant occupant notification evacuation alarms for enhanced life safety. It will also include timesaving, automatic diagnostic capabilities that will reduce maintenance costs. The new occupant notification systems will comply with the Americans with Disabilities Act. The fire alarm receiving equipment at the site fire department headquarters will be upgraded to ensure its reliability, modernize its technology, and meet the demands of an

expanded fire alarm system network.

e. Subproject 16 – Electrical Systems Modifications, Phase II (BNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
6,770	555	3,300	2,915	0	0	2Q 2002 – 1Q 2004

This project is the second phase of the modernization and refurbishment of the Laboratory's deteriorating 50 year-old electrical infrastructure. The project includes: installation of two new 13.8 kV feeders to provide alternate sources to existing, aged feeders; installation of additional underground ductbanks to support a new 13.8 kV feeder; replacement of 24 kV switchgear to increase system reliability/safety; reconditioning of 50 480-volt circuit breakers including replacing obsolete trip units with modern, solid-state trip devices; and the retrofit of 10 13.8 kV air breakers with new vacuum technology.

f. Subproject 17 – Mechanical and Control Systems Upgrade, Phase I (ANL-E)

<u>TEC</u>	<u>Prev.</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
9,000	0	803 <sup>a</sup>	3,045	5,152	0	3Q 2003 – 3Q 2005

This design project will provide design to upgrade and replace 30-40 year old mechanical system components in various facilities. It will optimize capacity, enhance system reliability and performance, improve safety, and reduce maintenance and repair costs of primary building mechanical equipment and control systems. The mechanical systems designated for replacement are no longer adequate, reliable, or efficient, and do not meet current ES&H standards (i.e. failure of laboratory exhaust systems could lead to the release of radioactive material). Specifically, this project will: upgrade HVAC systems in Buildings 221 and 362, including heating and cooling coils, fans, filter systems, ductwork, controls, and variable frequency drive fans; upgrade lab exhaust systems in Buildings 202 and 306, including new fans, ductwork, and controls; upgrade corroded drainage systems in Buildings 200, 205 and 350; and upgrade steam and condensate return systems in 12 facilities in the 360 area. This will include high and low pressure steam supply piping and associated pressure reducing stations, valves, and accessories; and replacing condensate pumping systems including piping, valves and system controls.

#### 4. Details of Cost Estimate

N/A

#### 5. Method of Performance

To the extent feasible, construction and procurement will be accomplished by fixed-price contracts awarded on the basis of competitive bids.

#### 6. Schedule of Project Funding

N/A

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<sup>a</sup> Title I and Title II Design funding provided under PED Project No. 02-SC-001.

## **7. Related Annual Funding Requirements**

N/A

## **8. Design and Construction of Federal Facilities**

All DOE facilities are designed and constructed in accordance with applicable Public Laws, Executive Orders, OMB Circulars, Federal Property Management Regulations, and DOE Orders. The total estimated cost of the project includes the cost of measures necessary to assure compliance with Executive Order 12088, "Federal Compliance with Pollution Control Standards;" section 19 of the Occupational Safety and Health Act of 1970, the provisions of Executive Order 12196, and the related Safety and Health provisions for Federal Employees (CFR Title 29, Chapter XVII, Part 1960); and the Architectural Barriers Act, Public Law 90-480, and implementing instructions in 41 CFR 101-19.6. The project will be located in an area not subject to flooding determined in accordance with Executive Order 11988. DOE has reviewed the GSA inventory of Federal Scientific laboratories and found insufficient space available, as reported by the GSA inventory.