

# Multiprogram Energy Laboratories - Facilities Support

## Program Mission

The Multiprogram Energy Laboratories - Facilities Support (MEL-FS) program provides line item construction funding (i.e., projects with a total estimated cost of \$5,000,000 or above) for general purpose facilities to support the infrastructure of the five Office of Science multiprogram national laboratories. These are: Argonne National Laboratory - East (ANL-E), Brookhaven National Laboratory (BNL), Lawrence Berkeley National Laboratory (LBNL), Oak Ridge National Laboratory (ORNL), and Pacific Northwest National Laboratory (PNNL). These laboratories are government-owned, contractor-operated (GOCO) and have over 1,100 buildings with 14.3 million gross square feet of space and an estimated replacement value of over \$9,000,000,000. Total operating funding for these laboratories is over \$3,000,000,000 a year. The Office of Science manages this program to provide a comprehensive, prioritized and equitable approach to its stewardship responsibility for the general purpose support infrastructure of these laboratories.

The program also provides funding for Payments in Lieu of Taxes (PILT) as authorized by the Atomic Energy Act of 1954, as amended. These discretionary payments are made to state or local governments where the Department or its predecessor agencies have acquired property previously subject to state or local taxation.

## Program Goal

To ensure that the support facilities at the multiprogram laboratories can meet the Department's research needs in a safe, environmentally sound, and cost-effective manner primarily by refurbishing or replacing deteriorated, outmoded, unsafe, and inefficient general purpose infrastructure.

## Program Objectives

- To correct Environment, Safety and Health (ES&H) inadequacies.
- To reduce risk of operational interruptions due to failed support systems.
- To provide cost effective operations and reduce maintenance costs.
- To provide quality space for multiprogram research and support activities.
- To preserve the government investment in the physical plant of the laboratories.
- To promote performance-based infrastructure management.

## **Performance Measures**

Performance measures related to the MEL-FS program are continuously being refined to ensure that they: 1) incorporate external/internal customer inputs; 2) drive performance; 3) address the strategic plan; and 4) focus on the effectiveness of the laboratory system. Current performance measures include:

- Support of line item construction funding to reduce risk, ensure continuity of operations, avoid or reduce costs and increase productivity.

Expectation: Fund highest priority needs based on scoring from Life Cycle Asset Management (LCAM) Cost-Risk-Impact Matrix.

- Overall condition of laboratory buildings.

Expectation: Increase the percentage of facilities rated adequate.

- Excellence in project management.

Expectation: Increase the percentage of projects completed within baseline cost and schedule.

## **Significant Accomplishments and Program Shifts**

- Progress in Line Item Projects - Two projects are scheduled for physical completion in FY 2000: the Building Electrical Services Upgrade- Phase I at ANL-E and the Electrical Services Rehabilitation-Phase IV at LBNL.
- Continue the Payments in Lieu of Taxes (PILT) for ANL-E and BNL.

## Funding Profile

(dollars in thousands)

	FY 1998 Current Appropriation	FY 1999 Original Appropriation	FY 1999 Adjustments	FY 1999 Current Appropriation	FY 2000 Request
Multiprogram Energy Laboratories- Facilities Support					
Multiprogram Energy Laboratories- Facilities Support .....	21,247	21,260	0	21,260	21,260
Use of Prior Year Balances .....	-336 <sup>a</sup>	-13 <sup>a</sup>	0	-13 <sup>a</sup>	0
<b>Total, Multiprogram Energy Laboratories- Facilities Support .....</b>	<b>20,911</b>	<b>21,247</b>	<b>0</b>	<b>21,247</b>	<b>21,260</b>

## Funding by Site

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Chicago Operations Office					
Argonne National Laboratory .....	10,892	7,359	5,246	-2,113	-28.7%
Brookhaven National Laboratory .....	568	2,239	7,775	+5,536	+247.2%
<b>Total, Chicago Operations Office .....</b>	<b>11,460</b>	<b>9,598</b>	<b>13,021</b>	<b>+3,423</b>	<b>+35.7%</b>
Oakland Operations Office					
Lawrence Berkeley National Laboratory	2,400	4,854	6,133	+1,279	+26.3%
Oak Ridge Operations Office					
Oak Ridge National Laboratory .....	7,387	6,808	2,106	-4,702	-69.1%
<b>Subtotal, Multiprogram Energy Laboratories - Facilities Support .....</b>	<b>21,247</b>	<b>21,260</b>	<b>21,260</b>	<b>0</b>	<b>0.0%</b>
Use of Prior Year Balances .....	-336 <sup>a</sup>	-13 <sup>a</sup>	0	+13	+100.0%
<b>Total, Multiprogram Energy Laboratories - Facilities Support .....</b>	<b>20,911</b>	<b>21,247</b>	<b>21,260</b>	<b>+13</b>	<b>+0.1%</b>

### Public Law Authorization:

Public Law 95-91, "Department of Energy Organization Act"

<sup>a</sup> Share of Science general reduction for use of prior year balances assigned to this program. The total general reduction is applied at the appropriation level.

## Site Description

### Argonne National Laboratory - East

Argonne National Laboratory - East (ANL-E) in Argonne, Illinois, is a Multiprogram Laboratory located on a 1,700 acre site in suburban Chicago. The laboratory consists of 122 facilities, 4.6 million gross square feet of space, with the average age of the facilities being 30 years. Approximately 29 percent of the space is considered adequate, while the remainder needs rehabilitation or replacement/demolition. The MEL-FS program is currently funding or proposes funding the following projects:

- MEL-001-03 - Electrical Systems Upgrade, Phase III (TEC \$7,620,000) Project includes upgrading transmission lines, transformers, switchgear, etc. to insure system reliability.
- MEL-001-06 - Central Supply Facility (TEC \$5,900,000) - This project will consolidate operations currently dispersed throughout the site into one central location.
- MEL-001-09 Fire Safety Improvements, Phase IV (TEC \$8,430,000) This proposed new start for FY 2000 will bring 30 major facilities into compliance with the Life Safety Code and the National Fire Alarm Code.

The program also provides funding for Payments in Lieu of Taxes (PILT) as authorized by the Atomic Energy Act of 1954, as amended. These discretionary payments are made to state or local governments where the Department or its predecessor agencies have acquired property previously subject to state or local taxation.

### Brookhaven National Laboratory

Brookhaven National Laboratory is a Multiprogram Laboratory located on a 5,200 acre site in Upton, New York. The laboratory consists of 349 facilities, 4.1 million gross square feet of space, with the average age of the facilities being 38 years. Approximately 27 percent of the space is considered adequate, while the remainder needs rehabilitation or replacement/demolition. The MEL-FS program is currently funding:

- MEL-001-04 - Electrical Systems Modifications, Phase I (TEC \$5,730,000) This project will include: the replacement of and installation of new cables and underground ductbanks; the installation of a new 13.8 kV - 2.4 kV substation and replacement of other obsolete components.
- MEL-001-07 - Sanitary System Modifications, Phase III (TEC \$6,500,000) This project will: replace or rehabilitate approximately 9,900 feet of existing deteriorated (8 to 20 inch) sewer piping; replace the sewage digester; connect five facilities to the sanitary system; and make other modifications to reduce discharges to the environment.

The program also provides funding for Payments in Lieu of Taxes (PILT) as authorized by the Atomic Energy Act of 1954, as amended. These discretionary payments are made to state or local governments where the Department or its predecessor agencies have acquired property previously subject to state or local taxation.

## **Lawrence Berkeley National Laboratory**

Lawrence Berkeley National Laboratory is a Multiprogram Laboratory located in Berkeley, California. The laboratory is on a 200 acre site adjacent to the Berkeley campus branch of the University of California. The laboratory consists of 118 facilities, 1.6 million gross square feet of space, with the average age of the facilities being 34 years. Approximately 19 percent of the space is considered adequate, while the remainder needs rehabilitation or replacement/demolition. The MEL-FS program is currently funding or proposes to fund the following projects:

- MEL-001-05 - Building 77-Rehabilitation of Building Structure and Systems (TEC \$8,000,000) This project will correct seismic deficiencies and refurbish and upgrade the electrical and mechanical systems to facilitate the high precision processes currently being performed in the facility.

## **Oak Ridge National Laboratory**

Oak Ridge National Laboratory is a Multiprogram Laboratory located on a 24,000 acre site in Oak Ridge, Tennessee. The laboratory consists of 466 facilities, 3.4 million gross square feet of space, with the average age of the facilities being 36 years. Approximately 18 percent of the space is considered adequate, while the remainder needs rehabilitation or replacement/demolition. The MEL-FS program is currently funding or proposes to fund the following projects:

- 94-E-363- Roofing Improvements (TEC \$16,000,000) This project is replacing the roofs on numerous facilities, thereby extending their lives significantly.
- MEL-001-08 Electrical Systems Upgrade (TEC \$5,900,000) This proposed new start for FY 2000 will include: replacing overhead feeders; installing advanced protective relaying capabilities at major substations; and replacing major switchgear and transformers.

# Multiprogram Energy Laboratories - Facilities Support

## Mission Supporting Goals and Objectives

This subprogram supports the program's goal to ensure that the multiprogram laboratories' support facilities can meet the Department's research needs primarily by refurbishing or replacing deteriorated, outmoded, unsafe, and inefficient general purpose infrastructure. General purpose facilities are general use, service and support facilities such as administrative space, cafeterias, general office/laboratory space, utility systems, sanitary sewers, roads, etc. Less than half of the space is considered fully adequate, while the remainder needs rehabilitation or replacement/demolition. The large percentage of inadequate space reflects the age of the facilities (average age of 33 years), changing research needs that require more office space and light laboratory space, ES&H requirements and obsolete systems.

Capital investment requirements are identified in laboratory Institutional Plans which address needs through the year 2003 based on expected programmatic support. The projected needs through the period total over \$320,000,000. Of this amount, 53 percent is to rehabilitate or replace buildings; 33 percent is for utility projects; and 14 percent for ES&H projects. All projects are first ranked using a prioritization model that takes into account risk, impacts, and mission need. The projects that have ES&H as the principal driver are further prioritized using the Risk Prioritization Model from the DOE ES&H and Infrastructure Management Plan process.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
General Purpose Facilities .....	10,829	10,271	15,500	+5,229	+50.9%
ES&H .....	10,418	9,829	4,600	-5,229	-53.2%
Infrastructure Support .....	0	1,160	1,160	0	0.0%
<b>Total, Multiprogram Energy Laboratories- Facilities Support .....</b>	<b>21,247</b>	<b>21,260</b>	<b>21,260</b>	<b>0</b>	<b>0.0%</b>

## Detailed Program Justification

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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### General Purpose Facilities

<ul style="list-style-type: none"> <li>■ Supports the initiation of one new General Purpose Facility subproject in FY 2000, as well as the continuation of three FY 1999 subprojects under the Multiprogram Energy Laboratories Infrastructure Project (MEL-001). The FY 2000 new start is for design activities on the Electrical Systems Upgrade at ORNL (\$357,000). The FY 1999 subprojects are the Central Supply Facility at ANL-E (\$3,380,000); the Electrical Systems Modifications, Phase I at BNL (\$3,881,000), and the Rehabilitation of Building 77 at LBNL (\$6,133,000). Also supports the ongoing Roofing Improvements Project at ORNL (\$1,749,000) (94-E-363) .</li> </ul>	10,829	10,271	15,500
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### ES&H

<ul style="list-style-type: none"> <li>■ Supports the initiation of one new ES&amp;H subproject in FY 2000, as well as the continuation of one FY 1998 and one FY 1999 subproject under the Multiprogram Energy Laboratories Infrastructure Project (MEL-001). The FY 2000 new start is for design activities on the Fire Safety Improvements, Phase IV at ANL-E (\$400,000). The FY 1999 subproject is the Sanitary System Modifications, Phase III at BNL (\$3,000,000). Also supports the completion of the Electrical Systems Upgrade, Phase III at ANL-E (\$1,200,000). . . . .</li> </ul>	10,418	9,829	4,600
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### Infrastructure Support

<ul style="list-style-type: none"> <li>■ Continue meeting payments in lieu of taxes assistance requirements for communities surrounding Brookhaven National Laboratory and Argonne National Laboratory-East. . . . .</li> </ul>	0	1,160	1,160
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<b>Total, Multiprogram Energy Laboratories - Facilities Support</b>	21,247	21,260	21,260
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## Explanation of Changes

	FY 2000 vs. FY 1999 (\$000)
■ There are no changes from FY 1999 to FY 2000 for the MEL-FS program. . . .	0
Total Funding Change, Multiprogram Energy Laboratories - Facilities Support . . .	0



# Capital Operating Expenses & Construction Summary

## Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior Year Approp- riations	FY 1998	FY 1999	FY 2000	Unapprop. Balance
MEL-001 Multiprogram Energy Laboratories Infrastructure Project .....	N/A	N/A	7,259	14,924	18,351	19,346
94-E-363 Roofing Improvements, ORNL ..	16,000	5,422	3,921	4,908	1,749	0
Total, Construction .....		5,422	11,180	19,832	20,100	19,346

# MEL-001 — Multiprogram Energy Laboratories, Infrastructure Project, Various Locations

(Changes from FY 1999 Congressional Budget Request are denoted with a vertical line in the left margin.)

## Significant Changes

Two new starts in FY 2000 include: Electrical Systems Upgrade, Oak Ridge National Laboratory, and Fire Safety Improvements, Phase IV, Argonne National Laboratory-East.

### 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>Design and Construction</b>			
FY 1998	7,259	7,259	2,358
FY 1999	14,924	14,924	8,955
FY 2000	18,351	18,351	18,782
FY 2001	17,316	17,316	21,210
FY 2002	2,030	2,030	8,205
FY 2003	0	0	370

### 3. Project Description, Justification and Scope

This project funds two types of subprojects:

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

General Purpose Facility Projects:

a. Subproject 01 - Upgrade Steam Plant, ORNL

<u>TEC</u>	<u>Prev.</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
5,300	0	3,400	1,900	0	0	1Q 1998 - 4Q 1999

This project will upgrade the ORNL steam plant by adding a new steam boiler of approximately 100,000 pounds per hour capacity and capable of burning both natural gas and fuel oil. The boiler will be procured with all necessary ancillary equipment, such as blowers, feedwater pumps, and controls. Suitable weather protection will be provided.

This project is needed because of the age of the five existing boilers. Three are 46 years old, one is 44 years old, and the fifth is 32 years old. The new boiler capacity will allow decreased firing time on the oldest boilers and will extend their useful life. In addition, the new boiler will improve the efficiency of the steam plant.

b. Subproject 04 - Electrical Systems Modifications, Phase I (BNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
5,730	0	0	849	3,881	1,000	2Q 1999 - 4Q 2001

This project is the first phase of a planned modernization and refurbishment of the Laboratory's electrical infrastructure. The project provides for the replacement of 30 to 50 year old deteriorating underground electrical cables, the addition of underground ductbanks to replace damaged portions and support new cabling, the installation of a new 13.8 kV - 2.4 kV substation to address capacity and operational problems, and the retrofitting/reconditioning of switchgear power circuit breakers.

c. Subproject 05 - Bldg. 77 - Rehabilitation of Building Structure and Systems (LBNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
8,000	0	0	754	6,133	1,113	2Q 1999 - 4Q 2001

This project will rehabilitate Building 77's structural system to restore lateral force resistance and arrest differential foundation settlement, and will modernize architectural, mechanical, and electrical systems. These upgrades will restore this 33 year-old, 68,000 sq.ft. building to acceptable seismic performance; provide environmental controls appropriate to precision fabrication processes; increase the reliability and maintainability of building systems; provide flexibility to meet future challenges; and extend building life by 40 years and building systems by 20 to 25 years.

d. Subproject 06 - Central Supply Facility (ANL-E)

<u>TEC</u>	<u>Prev.</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
5,900	0	0	1,860	3,380	660	2Q 1999 - 2Q 2001

This project is a change in scope from the stand-alone facility of 39,100 sq.ft. described in the FY 1999 President's Request. The proposed facility is a 22,000 sq.ft. addition to the Transportation and Grounds Facility (Bldg. 46) along with remodeling of 3,500 sq.ft. of space in the existing Transportation and Grounds Facility. This project will result in economies and efficiencies by providing a highly efficient and cost-effective consolidated facility to meet the missions of the Materials Group and the Property Group of ANL-East and will eliminate the need for 89,630 square feet of substandard (50 year-old) space in six buildings which will be demolished (Bldgs. 4, 5, 6, 26, 27, and 28). The Materials Group receives, sorts, stores, retrieves, and distributes the majority of all materials and supplies for the Laboratory. The Property Group tags, controls, stores, and distributes excess property and precious metals for the Laboratory. This facility will contain truck docks; receiving and distribution areas; inventory control; general material storage; support and office areas; property storage; and exterior hazardous storage. This project will also eliminate 7,000 linear feet of steam supply and return lines. This proposed scope change is a result of: process improvements that have led to a reduction in on-hand inventory, relocation of DOE records storage to off-site archives; relocation of mail services; and a reduction to the labs vehicular fleet that reduced the utilization of Bldg. 46.

e. Subproject 08 - Electrical Systems Upgrade (ORNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
5,900	0	0	0	357	5,543	3Q 2000 - 2Q 2002

This project will replace electrical distribution feeders and upgrade transformers and switchgear feeding research facilities and primary utility support facilities throughout the Oak Ridge National Laboratory (ORNL) complex. It will also provide advanced protective relaying and metering capabilities at major substations. The project is part of a phased infrastructure upgrade to restore the electrical distribution systems serving the ORNL. The purpose of the upgrade is to maintain a reliable source of electrical power appropriate for servicing scientific research facilities. Without the proposed upgrade, the potential for electrical faults and outages will increase as the distribution system ages, with attendant increased risk of equipment damage and the potential inability to meet laboratory programmatic goals due to downtime of critical facilities. These facilities include the central research facilities, supercomputing facility, Robotics and Process Systems facility, the central chilled water plant, and the steam plant. Also, maintenance costs involved in continued operation of the existing deteriorated system will increase as the system ages.

ES&H Projects:

a. Subproject 02 - Electrical Systems Rehab. Phase IV, (LBNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
6,500	0	2,400	4,100	0	0	2Q 1998 - 4Q 2000

The Blackberry Switching Station Replacement Project is the last major planned rehabilitation to the LBNL electrical power system, in order to maintain its reliability and improve its safety. The project will upgrade the existing 12 kV power system and utilize circuit breakers installed in the FY 1987 MEL-FS project improvement to the main Grizzly Substation.

The project will correct existing deficiencies in the power distribution system that serves the Blackberry Canyon Service Area. The improvements will replace the existing electrical system, which consists of aged and underrated electrical equipment, 20 to 30 years old in many instances, that is difficult to maintain and unsafe to operate. It will provide the Laboratory with increased operational flexibility as well as improvements in reliability, maintainability and safety.

b. Subproject 03 - Electrical Systems Upgrade, Phase III, (ANL-E)

<u>TEC</u>	<u>Prev.</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
7,620	0	1,459	4,961	1,200	0	2Q 1998 - 1Q 2001

The project provides for the upgrade of the main electrical substation at Facility 543 and Facility 549A.

The work consists of the following items: install a new 138 kV overhead steel pole transmission line and upgrade the existing transmission line, relocate an existing transformer, upgrade existing transformers, replace existing 13.2 kV outdoor switchgear, and replace existing oil circuit breaker.

The intended project will accomplish several objectives related to system reliability, personnel safety, environmental hazards, risk reduction and system expansion.

c. Subproject 07 - Sanitary System Modifications, Phase III, (BNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
6,500	0	0	500	3,000	3,000	2Q 1999 - 2Q 2002

The BNL Sanitary System consists of over 20 miles of collection piping which collects sanitary waste from nearly all the BNL facilities. The collection piping transports the waste via gravity piping and lift stations to a sewage treatment plant (STP). This project is the third phase of the upgrade of the Laboratory sanitary waste system. In the first two phases, major operations of the STP were upgraded and approximately 14,000 feet of trunk sewer lines were replaced, repaired, or lined. Phase III will continue this upgrade and will replace or rehabilitate approximately 9,900 feet of existing deteriorated (8 to 20 inch) sewer piping, connect five facilities to the sanitary system by installing 7,500 feet of new sewer pipe, and two new lift stations. This will eliminate non-compliant leaching

fields and cess pools, reduce non-contact cooling water flow into the sewage system by 72 million gallons per year by: diverting flow to the storm system; converting water heat exchangers to air cooled condensers; and replacing water cooled equipment in 15 buildings. The STP anaerobic sludge digester will be replaced with an aerobic sludge digester to eliminate high maintenance activity and improve performance, and install liners and modify the under drain piping in the STP sand filter beds.

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

<u>TEC</u>	<u>Prev.</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
8,430	0	0	0	400	8,030	3Q 2000 - 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 personnel and/or damage to DOE property in case of fire.

#### 4. Details of Cost Estimate

N/A

#### 5. Method of Performance

Design will be negotiated by architect-engineer contracts or laboratory personnel. 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

#### 7. Related Annual Funding Requirements

N/A

# 94-E-363 — Roofing Improvements, Oak Ridge National Laboratory, Oak Ridge, Tennessee

(Changes from FY 1999 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		
FY 1994 Budget Request ( <i>Preliminary Estimate</i> ) .....	1Q 1994	1Q 1995	2Q 1994	1Q 1997	16,000	16,132
FY 1996 Budget Request .....	1Q 1994	1Q 1995	2Q 1994	2Q 2000	16,000	16,132
FY 1998 Budget Request .....	1Q 1994	1Q 1995	2Q 1994	2Q 2001	16,000	16,132
FY 2000 Budget Request ( <i>Current Baseline Estimate</i> ) .....	1Q 1994	1Q 1995	2Q 1994	2Q 2001	16,000	16,132

## 2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
<b>Design and Construction</b>			
FY 1993	4,024	0 <sup>a</sup>	0
FY 1994	3,300	3,136 <sup>b</sup>	75
FY 1995	3,000	197 <sup>c</sup>	2,463
FY 1996	2,089	2,089	1,431
FY 1997	0	0	918
FY 1998	3,987	3,921 <sup>d</sup>	2,324
FY 1999	4,908	4,908	4,200
FY 2000	1,749	1,749	3,820
FY 2001	0	0	769

a This project was proposed as an FY 1993 new start (93-E-329). Application of a portion (-\$4,024,000) of the FY 1993 programmatic general reduction of \$40,000,000 necessitated a delay in the start of this project to FY 1994.

b Reflects reductions as follows: \$-68,000 Contractor Salary Freeze; \$-96,000 rescission.

c Reflects application of a portion (\$-2,803,000) of Energy Supply Research and Development reductions.

d Reflects application of a portion (\$66,000) of Science general reduction.

### **3. Project Description, Justification and Scope**

This project will replace deteriorated roofing on buildings and facilities throughout the Oak Ridge National Laboratory complex. ORNL has over 2.4 million square feet of roof area on approximately 160 buildings. Based on a recent study by the laboratory's Plant and Equipment Division, approximately seventy percent of the total area needs to be replaced due to age and deterioration. This project is the first of several planned projects to replace the deteriorated roofing. It will replace the roofs that are in the worst condition (top priority) on buildings housing the most important facilities. Most of the existing roofing materials contain asbestos and much of it has traces of radioactive contaminants. This project will provide for the installation of new roofing and includes the necessary engineered controls to assure compliance with applicable health and safety regulations.

Approximately 70 percent of the roofs have been in service for over 20 years. Because of age and deterioration, many of these roofs have already developed leaks and require an increasing amount of maintenance. The results of the Plant and Equipment Division study of these roofs, giving the type and condition of each roof by building, including conditions of asbestos and/or radioactive contamination, were used as the basis of the conceptual design. In some cases the problems have reached the point that they could affect equipment, records, and research activities, as well as the health and safety of personnel working in the buildings or facilities.

During the past few years budget constraints and the increased cost of satisfying environment, safety and health regulations have resulted in a reduction in funds available for roof replacement. The effects of this shortfall have been compounded by the increased cost associated with restrictions placed on work with or around asbestos materials. Most of the roofs needing replacement involve asbestos materials. This combination of factors has resulted in a growing backlog of roofs that need replacement due to a lack of adequate funding. The current average annual cost of roof repairs is \$800,000. This does not include damage from leaks before repairs are made. There is currently a backlog of over \$5,000,000 of repairs needed. The roof replacement program is normally funded from expense funds; however, line item funding is requested because of the magnitude of the backlog and the need to provide an acceptable margin of response to meeting future replacement needs in a timely manner.

Failure to fund this project will result in a continuation of the expensive piece-meal repair program. As the roofs age, the number of leaks will increase, repairs will become more expensive and the potential for serious structural and equipment damage will grow, along with the threat to employee health and safety. Further deterioration of facilities could result in decreased program funding for DOE and ORNL.

Use of the metric system of measurement for design, procurement and construction of this project was considered; but because of the nature of the work and the prevailing practices in the region, it was determined to be uneconomical.



## 4. Details of Cost Estimate <sup>a</sup>

(dollars in thousands)

	Current Estimate	Previous Estimate
Engineering design inspection and administration of construction costs		
Engineering, design and inspection at approximately 7% of construction costs . . . . .	800	800
Construction management at approximately 12% of construction costs . . . . .	1,300	1,300
Project management costs at approximately 2% of engineering, design and inspection costs and construction management costs . . . . .	200	200
Total, Engineering design inspection and administration of construction costs . . . . .	2,300	2,300
Construction Costs (install new roofing) <sup>b</sup> . . . . .	2,860	2,860
Removal and packaging of existing roofing . . . . .	8,040	8,040
Design and project liason, testing, checkout and acceptance . . . . .	200	200
Total, Construction Costs . . . . .	13,400	13,400
Contingencies at approximately 19 percent of above costs . . . . .	2,600	2,600
Total line item cost (TEC) . . . . .	16,000	16,000

## 5. Method of Performance

Design shall be performed under a negotiated architect-engineer contract and inspection shall be performed by the operating contractor. To the extent feasible, construction and procurement shall be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding.

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<sup>a</sup> The cost estimate is based on conceptual design completed April 1991 at a cost of \$70,000 and updated March 1993. The DOE Headquarters Economic Escalation Indices for Construction Projects were used as appropriate over the project cycle.

<sup>b</sup> Construction costs include \$60,000 for readiness reviews.

## 6. Schedule of Project Funding

(dollars in thousands)

	Prior Years	FY 1998	FY 1999	FY 2000	Outyears	Total
Project cost						
Facility Cost						
Line Item TEC .....	4,887	2,324	4,200	3,820	769	16,000
Other Project Costs						
Conceptual design cost .....	70	0	0	0	0	70
Site characterization .....	7	0	0	0	0	7
NEPA documentation .....	5	0	0	0	0	5
Other project-related costs .....	50	0	0	0	0	50
Total, Other project costs .....	132	0	0	0	0	132
Total Project Cost (TPC) .....	5,019	2,324	4,200	3,820	769	16,132

## 7. Related Annual Funding Requirements

(dollars in thousands)

	Current Estimate	Previous Estimate
Facility maintenance and repair costs <sup>a</sup> .....	515	515
Total related annual funding .....	515	515
Total operating costs (from FY 2001 through FY 2021) .....	515	515

<sup>a</sup> Includes dollars to repair roofing installed by this project over the estimated 20 years of life.