

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 provides 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. Local communities around ANL-E, BNL, and ORNL qualify for PILT.

The program also supports costs incurred for centralized Oak Ridge Operations Office (ORO) infrastructure requirements and general operating costs essential to maintaining a viable, functioning operations office. Activities include roads and grounds maintenance, infrastructure maintenance, physical security, emergency management, support of the Oak Ridge Financial Service Center and other technical needs related to landlord responsibilities of the ORO.

Program Goals

- To ensure that the support facilities at the multiprogram laboratories 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.
- To provide landlord support for the centralized Oak Ridge Operations Office and the Oak Ridge Reservation activities.

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 multiprogram laboratories.
- To promote performance-based infrastructure management.
- To support local communities via Payments in Lieu of Taxes (PILT).
- To provide landlord support for the Oak Ridge Reservation and for the Oak Ridge Operations Office.

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. Fund highest priority needs based on scoring from Life Cycle Asset Management (LCAM) Cost-Risk-Impact Matrix.
- Overall condition of laboratory buildings. Increase the percentage of buildings rated adequate.
- Excellence in project management. Increase the percentage of projects completed within baseline cost and schedule.
- Continuity of Operations at the Oak Ridge Reservation and the Oak Ridge Operations Office. Interruptions due to infrastructure, security or emergency management system failures are minimized.
- Support of local communities. Meet, in a timely manner, DOE's obligations to local communities via Payments in Lieu of Taxes (PILT), where applicable.

Significant Accomplishments and Program Shifts

- Progress in Line Item Projects - Four projects are scheduled for construction completion in FY 2001: the Central Supply Facility at ANL-E; the Electrical Systems Modifications - Phase I at BNL; Building 77 Rehabilitation at LBNL; and the Electrical Systems Upgrade, Phase III at ANL-E.
- The program includes funding of Oak Ridge Operations Office Site Landlord activities beginning in FY 2000.
- The direct funding for the American Museum for Science and Energy (AMSE) under the Oak Ridge Landlord activities will end in FY 2000. Museum operation is transferred to Oak Ridge National Laboratory where alternative funding mechanisms are being developed, including support by private or industrial partners, and possibly, an admission fee for adults.

Funding Profile

(dollars in thousands)

	FY 1999 Current Appropriation	FY 2000 Original Appropriation	FY 2000 Adjustments	FY 2000 Current Appropriation	FY 2001 Request
Multiprogram Energy Laboratories- Facilities Support					
Multiprogram Energy Laboratories- Facilities Support.....	21,260	21,260	-5	21,255	23,219
Oak Ridge Landlord	0	11,800	0	11,800	10,711
Subtotal, Multiprogram Energy Laboratories-Facilities Support..	21,260	33,060	-5	33,055	33,930
Use of Prior Year Balances	-13 ^a	0	0	0	0
General Reduction	0	-5	+5	0	0
Total, Multiprogram Energy Laboratories- Facilities Support.....	21,247	33,055	0	33,055	33,930

Public Law Authorization:

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

Public Law 103-62, "Government Performance Results Act of 1993"

^a 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.

Funding by Site

(dollars in thousands)

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Chicago Operations Office					
Argonne National Laboratory.....	7,089	4,980	6,660	+1,680	+33.7%
Brookhaven National Laboratory.....	1,349	6,881	6,659	-222	-3.2%
Chicago Operations Office.....	1,160	1,160	1,160	0	0.0%
Total, Chicago Operations Office	9,598	13,021	14,479	+1,458	+11.2%
Oakland Operations Office					
Lawrence Berkeley National Laboratory.....	4,854	6,133	2,113	-4,020	-65.5%
Oak Ridge Operations Office					
Oak Ridge National Laboratory.....	6,808	1,101	6,627	+5,526	+501.9%
Oak Ridge Operations Office.....	0	11,800	10,711	-1,089	-9.2%
Total, Oak Ridge Operations Office	6,808	12,901	17,338	+4,437	+34.4%
Washington Headquarters.....	0	1,000	0	-1,000	-100.0%
Subtotal, Multiprogram Energy Laboratories - Facilities Support					
	21,260	33,055	33,930	+875	+2.6%
Use of Prior Year Balances	-13 ^a	0	0	0	0.0%
Total, Multiprogram Energy Laboratories - Facilities Support	21,247	33,055	33,930	+875	+2.6%

^a 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 31 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-001-06 - 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 project will bring 30 major facilities into compliance with the Life Safety Code and the National Fire Alarm Code.

The program also provides funding through the Chicago Operations Office 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 39 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 step-down transformer 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.
- MEL-001-13 Groundwater and Surface Water Protection (TEC \$6,050,000) This proposed new start for FY 2001 will implement a backlog of ground and surface water protection projects which 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; replacement of radioactive waste tanks with secondarily contained tanks.

- MEL-001-16 Electrical Systems Modifications, II (TEC \$6,770,000) This proposed new start for FY 2001 will be 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 2.4 kV switchgear to increase system reliability and 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.

The program also provides funding through the Chicago Operations Office 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.

- MEL-001-12 - Site-wide Water Distribution System Upgrade (TEC \$8,300,000) This proposed new start for FY 2001 will rehabilitate the Lab's High Pressure Water (HPW) System to include: replacement of all 1.4 km of cast iron pipe with ductile iron pipe; installing cathodic protection; replacing and adding pressure reducing stations to prevent excessive system pressure at lower lab elevations; adding an emergency fire water tank to serve the East Canyon; and providing the two current emergency fire water tanks with new liners and seismic upgrades.

Oak Ridge National Laboratory

Oak Ridge National Laboratory (ORNL) 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 37 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:

- MEL-001-08 Electrical Systems Upgrade (TEC \$5,900,000) This project will include: replacing overhead feeders; installing advanced protective relaying capabilities at major substations; and replacing major switchgear and transformers.
- MEL-001-14 Fire Protection System Upgrade (TEC \$5,920,000) This proposed new start for FY 2001 will: replace deteriorated, obsolete systems with more reliable fire alarm and suppression capabilities; replace the single 16-inch water main in the east central section of ORNL with a looped system; and extend coverage of automatic alarm systems and sprinkler systems to areas not previously served. The fire alarm receiving equipment at the site fire department headquarters will also be upgraded to ensure its reliability, modernize its technology, and meet the demands of an expanded fire alarm system network.
- MEL-001-15 Facilities HVAC Upgrade (TEC \$7,100,000) This proposed new start for FY 2001 will provide improvements to aging HVAC systems (average age 38 years) located in the thirteen buildings which comprise ORNL's central research complex and additions and improvements to the chilled water distribution system. This includes: redesign of the cooling water distribution system to reduce the number of pumps required and installing more efficient pumps, thereby reducing operations and maintenance costs; installation of an 800 ft., 8-inch-diameter pipe, chill water cross-tie to Bldgs. 4501/4505 from the underground tie-line between Bldgs. 4500N/4509 to address low capacity problems in 4501/4505; installation of a 500 ft. 4-inch-diameter pipe to feed new chilled water coils in the east wing of Bldg. 3500; upgrade of the existing 50 year-old air handler with new dampers, filters, steam coils, and controls; and replacement of constant volume, obsolete air handlers in various buildings with variable air volume (VAV) improvements to more efficiently control temperature.

Oak Ridge Operations Office

The Oak Ridge Landlord program provides for centralized Oak Ridge Operations Office (ORO) infrastructure requirements and general operating costs for activities on the Oak Ridge Reservation outside plant fences and activities to maintain a viable operations office, including maintenance of roads and grounds and other infrastructure, operation of the Emergency Management Program Office, Payments In Lieu of Taxes, physical security and support for the Oak Ridge Financial Service Center as well as other technical needs related to landlord activities.

Multiprogram Energy Laboratories - Facilities Support

Mission Supporting Goals and Objectives

This subprogram supports the program's goal to ensure that support facilities at the Office of Science multiprogram laboratories 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 that address needs through the year 2004 based on expected programmatic support. The projected needs through the period total over \$450,000,000. Of this amount, 65 percent is to rehabilitate or replace buildings; 21 percent is for utility projects; and 11 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 1999	FY 2000	FY 2001	\$ Change	% Change
General Purpose Facilities	10,271	14,495	8,816	-5,679	-39.2%
Environment, Safety and Health	9,829	4,600	13,243	+8,643	+187.9%
Infrastructure Support	1,160	2,160	1,160	-1,000	-46.3%
Total, Multiprogram Energy Laboratories- Facilities Support	21,260	21,255	23,219	+1,964	+9.2%

Detailed Program Justification

(dollars in thousands)

FY 1999	FY 2000	FY 2001
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General Purpose Facilities

<ul style="list-style-type: none"> ■ Provides funding to support the initiation of one new subproject in FY 2001 as well as the continuation of one FY 2000 subproject and the completion of three FY 1999 subprojects under the Multiprogram Energy Laboratories Infrastructure Project (MEL-001). The FY 2001 funding for a new start is for design activities for the Facilities HVAC Upgrade at ORNL (\$500,000). The FY 2000 subproject is the Electrical Systems Upgrade at ORNL (\$5,543,000). The FY 1999 subprojects are the Central Supply Facility at ANL-E (\$660,000); the Electrical Systems Modifications, Phase I at BNL (\$1,000,000), and the Rehabilitation of Building 77 at LBNL (\$1,113,000)..... 	10,271	14,495	8,816
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Environment, Safety and Health

<ul style="list-style-type: none"> ■ Provides funding to support the initiation of four new ES&H subprojects in FY 2001, as well as the continuation of one FY 2000 subproject under the Multiprogram Energy Laboratories Infrastructure Project (MEL-001). The FY 2001 funding for new starts is for design activities for Ground and Surface Water Protection Upgrades at BNL (\$1,889,000); Fire Protection System Upgrades at ORNL (\$584,000); Site-wide Water Distribution System Upgrade at LBNL (\$1,000,000); and Electrical Systems Modifications, II at BNL (\$770,000). The FY 2000 subproject is the Fire Safety Improvements, Phase IV at ANL-E (\$6,000,000). Also supports the completion of the Sanitary System Modifications, Phase III at BNL (\$3,000,000). 	9,829	4,600	13,243
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Infrastructure Support

<ul style="list-style-type: none"> ■ Continue meeting Payments in Lieu of Taxes (PILT) assistance requirements for communities surrounding Brookhaven National Laboratory and Argonne National Laboratory-East.... 	1,160	2,160	1,160
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(dollars in thousands)

	FY 1999	FY 2000	FY 2001
Total, Multiprogram Energy Laboratories - Facilities Support	21,260	21,255	23,219

Explanation of Funding Changes from FY 2000 to FY 2001

	FY 2001 vs. FY 2000 (\$000)
<ul style="list-style-type: none"> ■ The increase from FY 2000 to FY 2001 for the General Purpose Facilities and the Environment, Safety and Health programs reflects the additional new project starts in FY 2001..... ■ The decrease in the Infrastructure Support subprogram is for Payments in Lieu of Taxes (PILT) which were increased by \$1,000,000 in the FY 2000 appropriation to eliminate arrearages through fiscal year 1998..... 	<p>+2,964</p> <hr/> <p>-1,000</p>
Total Funding Change, Multiprogram Energy Laboratories - Facilities Support.....	<u>+1,964</u>

Oak Ridge Landlord

Mission Supporting Goals and Objectives

This subprogram supports landlord responsibilities for the centralized Oak Ridge Operations Office including infrastructure of the Oak Ridge Reservation (the 24,000 acres of the Reservation outside of the Y-12 plant, ORNL, and the East Tennessee Technology Park). This includes roads and grounds maintenance, infrastructure maintenance, support of the Oak Ridge Financial Service Center, physical security, emergency management, PILT for Oak Ridge communities, and other technical needs related to landlord requirements.

Funding Schedule

(dollars in thousands)

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Oak Ridge Landlord	0	11,800	10,711	-1,089	-9.2%

Detailed Program Justification

(dollars in thousands)

FY 1999	FY 2000	FY 2001
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Oak Ridge Landlord

<ul style="list-style-type: none"> ■ Roads, Grounds and Other Infrastructure and ES&H Improvements ■ Physical Security for the Oak Ridge Operations Office landlord responsibilities - provides for an around the clock security force. ■ Emergency Management Program Office - provides for the operation of the Oak Ridge Emergency Operations Center and the Communications and Operations Center..... ■ Payments in Lieu of Taxes (PILT) to the City of Oak Ridge, and Anderson and Roane Counties ■ American Museum of Science and Energy – supports operation of the museum. Direct support for the museum ends in FY 2000. Museum operation will be transferred to ORNL where alternative funding mechanisms are being developed, including support by private or industrial partners, and possibly an admission fee for adults. 	0 0 0 0 0	2,200 2,500 1,400 1,700 1,100	2,200 2,500 1,400 1,700 0
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(dollars in thousands)

FY 1999	FY 2000	FY 2001
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■ Oak Ridge Financial Service Center – provides computer and systems support to the Center which serves other DOE field offices as well as Oak Ridge.	0	2,000	2,000
■ Other Technical Support includes recurring activities such as computer and systems support for Directives and Training activities and one-time activities such as the identification, packaging, and shipment of documents relating to Human Radiation Experimentation to the National Archives for permanent storage and support for legacy legal cases.	0	900	911
Total, Oak Ridge Landlord	0	11,800	10,711

Explanation of Funding Changes from FY 2000 to FY 2001

FY 2001 vs. FY 2000 (\$000)

Oak Ridge Landlord

■ Direct support for the American Museum of Science and Energy will end in FY 2000. Museum operation will be transferred to Oak Ridge National Laboratory which is developing alternative funding mechanisms including support by private or industrial partners, and possibly an admission fee for adults.	-1,100
■ Continue technical support at FY 2000 level of effort.....	+11
Total Funding Change, Oak Ridge Landlord.....	-1,089

Capital Operating Expenses & Construction Summary

Capital Operating Expenses

(dollars in thousands)

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
General Plant Projects	0	300	200	-100	-33.3%
Capital Equipment	0	100	325	+225	+225.0%
Total, Capital Operating Expenses	0	400	525	+125	+31.3%

Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior Year Approp- riations	FY 1999	FY 2000	FY 2001	Unapprop. Balance
Project - MEL-001 Multiprogram Energy Laboratories Infrastructure Project FY 2001 Datasheet	N/A	N/A	14,924	18,351	22,059	31,427
Total, MELFS Construction ^a	N/A	N/A	20,100^a	19,095^a	22,059^a	31,427

^a Total MELFS construction, including projects fiscally completed prior to FY 2001.

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

(Changes from FY 2000 Congressional Budget Request are denoted with a vertical line in the left margin.)

Significant Changes

Five new starts in FY 2001 include: Ground and Surface Water Protection Upgrades at Brookhaven National Laboratory, Fire Protection System Upgrades at Oak Ridge National Laboratory; Site-wide Water Distribution System Upgrade at Lawrence Berkeley National Laboratory; Facilities HVAC Upgrade at Oak Ridge National Laboratory; and Electrical Systems Modifications, II at Brookhaven National Laboratory.

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
Design and Construction			
FY 1998	7,259	7,259	2,358
FY 1999	14,924	14,911	9,561
FY 2000	18,351	18,351	17,789
FY 2001	22,059	22,059	22,567
FY 2002	20,150	20,150	19,564
FY 2003	11,277	11,277	14,546
FY 2004	0	0	7,185
FY 2005	0	0	437

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 support facilities such as administrative space, cafeterias, utility systems, and roads; and

- Projects to correct ES&H deficiencies including fire safety improvements, sanitary system upgrades and electrical system replacements.

General Purpose Facility Projects:

a. Subproject 01 - Upgrade Steam Plant, ORNL

<u>TEC</u>	<u>Prev.</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
5,300	3,400	1,900	0	0	0	1Q 1998 - 4Q 1999

This project upgraded 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 was procured with all necessary ancillary equipment, such as blowers, feedwater pumps, and controls. Suitable weather protection is provided.

This project was 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 allows decreased firing time on the oldest boilers and extends their useful life. In addition, the new boiler improves the efficiency of the steam plant.

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

<u>TEC</u>	<u>Prev.</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
5,730	0	849	3,881	1,000	0	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 step-down transformer 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 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
8,000	0	754	6,133	1,113	0	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 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
5,900	0	1,860	3,380	660	0	2Q 1999 - 4Q 2001

This project includes 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. The 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.

e. Subproject 08 - Electrical Systems Upgrade (ORNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
5,900	0	0	357	5,543	0	3Q 2000 - 3Q 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.

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

<u>TEC</u>	<u>Prev.</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
7,100	0	0	0	500	6,600	2Q 2001 – 1Q 2004

This project will provide improvements to aging HVAC systems (average age 38 years) located in the thirteen (13) buildings which comprise Oak Ridge National Laboratory's (ORNL's) central research complex and additions and improvements to the chiller water distribution system. This includes: redesign of the cooling water distribution system to reduce the number of pumps required and installing more

efficient pumps, thereby reducing operations and maintenance costs; installation of an 800 ft., 8-inch-diameter pipe, chill water cross-tie to Bldgs. 4501/4505 from the underground tie-line between Bldgs. 4500N/4509 to address low capacity problems in 4501/4505; installation of a 500 ft. 4-inch-diameter pipe to feed new chilled water coils in the east wing of Bldg. 3500; upgrade of the existing 50 year-old air handler with new dampers, filters, steam coils, and controls; and replacement of constant volume, obsolete air handlers in various buildings with variable air volume (VAV) improvements to more efficiently control temperature.

ES&H Projects:

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

<u>TEC</u>	<u>Prev.</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/Completion Dates</u>
6,500	2,400	4,100	0	0	0	2Q 1998 - 3Q 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 upgraded the existing 12 kV power system and utilized circuit breakers installed in the FY 1987 MEL-FS project improvement to the main Grizzly Substation.

The project corrected existing deficiencies in the power distribution system that serves the Blackberry Canyon Service Area. The improvements replaced the existing electrical system, which consisted of aged and underrated electrical equipment, 20 to 30 years old in many instances, which is difficult to maintain and unsafe to operate. It provided 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 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/Completion Dates</u>
7,620	1,459	4,961	1,200	0	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 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/Completion Dates</u>
6,500	0	500	3,000	3,000	0	2Q 1999 - 2Q 2002

The BNL Sanitary System consists of over 20 miles of collection piping that 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 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/Completion Dates</u>
8,430	0	0	400	6,000	2,030	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.

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

<u>TEC</u>	<u>Prev.</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/Completion Dates</u>
8,300	0	0	0	1,000	7,300	2Q 2000 - 2Q 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 lab

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.

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

<u>TEC</u>	<u>Prev.</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
6,050	0	0	0	1,889	4,161	2Q 2001 - 2Q 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 DHS Article 12 upgrades.

g. Subproject 14 - Fire Protection System Upgrade, (ORNL)

<u>TEC</u>	<u>Prev.</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
5,920	0	0	0	584	5,336	2Q 2001 - 2Q 2004

This project will upgrade the 36 year-old fire protection system with improved, more reliable fire alarm and suppression capabilities by: replacing deteriorated, obsolete systems; replacing the single 16-inch water main in the east central section of ORNL with a looped system (7,000 lf of 16 inch pipe); and by extending coverage of automatic alarm systems and sprinkler 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.

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

<u>TEC</u>	<u>Prev.</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Outyear</u>	<u>Construction Start/ Completion Dates</u>
6,770	0	0	0	770	6,000	2Q 2001 – 1Q 2003

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 2.4 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.

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