Multiprogram Energy Laboratories - Facilities Support

Program Mission

The mission of the Multiprogram Energy Laboratories - Facilities Support (MEL-FS) program is to support the infrastructure of the five Office of Science (SC) multiprogram national laboratories to enable them to conduct today's high technology scientific research. The notable success of the SC multiprogram laboratories in delivering insights and innovations rests on their distinctive technical and scientific expertise and unique capabilities, including the major user facilities. Continued success depends critically on the ability to maintain both the facilities and the expertise, which requires the existence of an adequate, ES&H compliant and cost effective general purpose infrastructure.

The program funds line item construction funding (i.e., projects with a total estimated cost of $5,000,000 or above) for general purpose facilities at 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 1,600 buildings (including 500 trailers) with 15.5 million gross square feet of space and an estimated replacement value of over $10 billion. Total operating funding for these laboratories is over $3 billion a year.

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 general purpose infrastructure at the multiprogram laboratories meets 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.

Significant Accomplishments and Program Shifts

- Progress in Line Item Projects – Two projects were completed in FY 2000: the Building Electrical Services Upgrade – Phase I at ANL-E and the Electrical Services Rehabilitation – Phase IV at LBNL. Three projects are scheduled for completion in FY 2001: the Central Supply Facility at ANL-E; the Electrical Systems Modifications – Phase I at BNL; and the Electrical Systems Upgrade - Phase III at ANL-E. Two projects are scheduled for completion in FY 2002: Building 77 - Rehabilitation of Building Structure and Systems at LBNL and the Sanitary Systems Modifications – Phase III at BNL.
- The scope of the Building 77-Rehabilitation of Building Structure and Systems project at LBNL was reduced to eliminate the mechanical, electrical and architectural work from the project. This leaves only the structural work which will arrest the differential settling and reinforce the lateral force resisting system of the building. This reduction was necessitated by the original bids for construction being significantly higher than expected due to a tight labor market, work difficulty and location, and operational commitments in the facility that limited the work site availability. This rescoping of the project has added seven months to the project schedule.
- The direct funding for the American Museum for Science and Energy under the Oak Ridge Landlord subprogram ended in FY 2000. Museum operation was transferred to the 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 2000 Comparable Appropriation	FY 2001 Original Appropriation	FY 2001 Adjustments	FY 2001 Comparable Appropriation	FY 2002 Request
Multiprogram Energy Laboratories-Facilities Support					
Multiprogram Energy Laboratories-Facilities Support	21,255	23,219	-404	22,815	22,816
Oak Ridge Landlord	8,302	10,711	-3,352	7,359	7,359
Total, Multiprogram Energy Laboratories-Facilities Support	29,557[a]	33,930	-3,756	30,174	30,175
General Reduction	0	-315	315	0	0
General Reduction for Safeguards and Security	0	-3,373	3,373	0	0
Omnibus Rescission	0	-68	68	0	0
Total, Multiprogram Energy Laboratories – Facilities Support	29,557 [a]	30,174	0	30,174	30,175

Public Law Authorization:
Public Law 95-91, "Department of Energy Organization Act"
Public Law 103-62, "Government Performance and Results Act of 1993"

[a] Excludes $3,498,000 for Safeguards and Security activities transferred to consolidated Safeguards and Security program in FY 2001.

Funding by Site

(dollars in thousands)

	FY 2000	FY 2001	FY 2002	$ Change	% Change
Chicago Operations Office					
Argonne National Laboratory	4,980	6,611	2,833	-3,778	-57.1%
Brookhaven National Laboratory	6,881	6,444	6,063	-381	-5.9%
Chicago Operations Office	1,890	1,020	1,020	0	0.0%
Total, Chicago Operations Office	13,751	14,075	9,916	-4,159	-29.5%
Oakland Operations Office					
Lawrence Berkeley National Laboratory	6,133	2,113	4,400	+2,287	+108.2%
Oak Ridge Operations Office					
Oak Ridge National Laboratory	1,101	6,627	7,620	+993	+15.0%
Oak Ridge Operations Office	8,302	7,359	7,359	0	0.0%
Total, Oak Ridge Operations Office	9,403	13,986	14,979	+993	+7.1%
Richland Operations Office					
Pacific Northwest National Laboratory	0	0	880	+880	+100.0%
Washington Headquarters	270	0	0	0	--
Total, Multiprogram Energy Laboratories - Facilities Support	29,557 [a]	30,174	30,715	+1	--

[a] Excludes $3,498,000 in FY 2000 for Safeguards and Security activities transferred to consolidated Safeguards and Security program in FY 2001.

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 44 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-001-09 Fire Safety Improvements - Phase IV (TEC $8,381,000) This project will bring 30 major facilities into compliance with the Life Safety Code and the National Fire Alarm Code.

- MEL-001-17 Mechanical and Control Systems Upgrade – Phase I (TEC $9,000,000) This proposed new start for FY 2002 will upgrade or replace 30-40 year old, deteriorated mechanical system components in various facilities. These will include HVAC, drainage, steam supply, and condensate return systems. This project will optimize capacity, enhance system reliability and performance, improve safety, and reduce maintenance costs. These systems are no longer adequate, reliable, or efficient, and do not meet current ES&H standards (e.g., failure of a laboratory exhaust system could lead to release of radioactive material).

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 35 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-001-13 Groundwater and Surface Water Protection Upgrades (TEC $6,050,000) This on-going project will address 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; and replacement of radioactive waste tanks with secondarily contained tanks.

- MEL-001-16 Electrical Systems Modifications, II (TEC $6,770,000) This ongoing 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 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 15 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 project:

- MEL-001-12 Site-wide Water Distribution System Upgrade (TEC $8,300,000) This ongoing project rehabilitates 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 20 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-001-14 Fire Protection System Upgrade (TEC $5,920,000) This ongoing project replaces deteriorated, obsolete systems with more reliable fire alarm and suppression capabilities; replaces the single 16-inch water main in the east central section of ORNL with a looped system; and extends coverage of automatic alarm and sprinkler systems to areas not previously served. Upgrading the fire alarm receiving equipment at the site fire department headquarters ensures its reliability, modernizes its technology, and meets the demands of an expanded fire alarm system network.

- MEL-001-15 Laboratory Facilities HVAC Upgrade (TEC $7,100,000) This ongoing project provides improvements to aging HVAC systems (average age 38 years) located in the 13 buildings which comprise ORNL's central research complex and make 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 Buildings 4501/4505 from the underground tie-line between Buildings 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 Building 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.

- MEL-001-25 Research Support Center (TEC $16,100,000) This proposed new start for FY 2002 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, cafeteria, visitor reception and control area, and support offices for approximately 50 occupants. 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 the 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 lab now undergoing decontamination. The estimated simple payback is seven years.

Pacific Northwest National Laboratory

Pacific Northwest National Laboratory (PNNL) is a Multiprogram Laboratory located on a 960 acre site on the south end of the Hanford Reservation near Richland, Washington. The laboratory consists of 40 facilities, 0.9 million gross square feet of space, with the average age of the facilities being 29 years. Approximately 36 percent of the space is considered adequate, while the remainder needs rehabilitation or replacement/demolition. The MEL-FS program proposes funding the following project:

- MEL-001-18 Laboratory Systems Upgrades (TEC $9,000,000) This proposed new start for FY 2002 will upgrade or replace 20-50 year old mechanical system components in eight high occupancy facilities at PNNL. This project will upgrade these obsolete systems with more efficient, 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; and replacement of an emergency power generator.

Chicago Operations Office

The Chicago Operations Office processes the Payments in Lieu of Taxes made to the local taxing authorities at Brookhaven National Laboratory and Argonne National Laboratory-East.

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, 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 five Office of Science (SC) multiprogram national 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.

The subprogram strives to improve the condition of laboratory buildings (i.e., increasing the percentage of buildings rated adequate). **Performance will be measured** by the increase in the percentage of facilities rated adequate over time. The percentage of space rated adequate increased from 26% in FY 1998 to 30% in FY 2000.

Capital investment requirements are identified in laboratory Strategic Facilities Plans that address infrastructure needs through the year 2011 to adequately support expected programmatic activities. These plans (currently under SC review) assume the full modernization/revitalization of the general purpose infrastructure of the multiprogram labs will be completed over this period. The projected investments total is ~$1,000,000,000. Of this amount, 85% is to rehabilitate or replace buildings; 9% is for utility projects; and 6% for ES&H and other projects.

The large backlog of building related projects reflects the fact that the condition of only 50% of the laboratory space is considered fully adequate, while the remaining 50% needs rehabilitation or replacement/demolition. Often, even adequate space is not functional for modern research purposes (e.g., a well maintained 1940 vintage wooden barracks is not particularly useful when modern lab/office space is needed). The large percentage of inadequate space is due to:

the age of the facilities (over 69% of the buildings are 30 years old or older and, 43% are 40 years old or older)

changing research needs that require different kinds of space (e.g., more office space and light laboratory space than hot cells)

obsolescence of existing systems and components

changing technology (e.g., digital controls)

changing environmental, safety and health regulations, and

inadequate capital investment in the past

The backlog of utilities and ES&H projects is much lower ($150,000,000 or 15% of the total backlog) due to investments by the MEL-FS program over the last 20 years. Utilities and ES&H projects consistently scored highest and limited funding did not allow many building needs to be addressed.

In any given budget year, all candidate projects for funding are first ranked using the Life Cycle Asset Management (LCAM) Cost-Risk-Impact Matrix 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. Based on these rankings, the subprogram funds the highest priority projects that reduce risk, ensure continuity of operations, avoid or reduce costs, and increase productivity. **Performance will be measured by** the percentage of projects that rank among the highest priority projects and have a Capital Asset Management Process (CAMP) ranking score of greater than 50. All FY 2000-FY 2002 funded projects were evaluated by an integrated infrastructure management team as the highest priority projects and each has a CAMP score greater than 60.

The subprogram ensures that the funded projects are managed effectively and completed within the established cost, scope and schedule baselines. **Performance will be measured by** the number of projects completed within the approved baselines for cost (at or below the appropriated TEC), scope (within 10%), and schedule (within six months). Both projects scheduled for completion in FY 2000 were completed within the approved baselines for cost, scope, and schedule.

Funding Schedule

(dollars in thousands)

	FY 2000	FY 2001	FY 2002	$ Change	% Change
General Purpose Facilities	14,495	8,816	5,380	-3,436	-39.0%
Environment, Safety and Health	4,600	12,979	16,416	+3,437	+26.5%
Infrastructure Support	2,160	1,020	1,020	0	--
Total, Multiprogram Energy Laboratories - Facilities Support	21,255	22,815	22,816	+1	--

Detailed Program Justification

(dollars in thousands)

FY 2000	FY 2001	FY 2002

General Purpose Facilities **14,495** **8,816** **5,380**

Provides funding to support the initiation of two new subprojects in FY 2002 as well as the continuation of one FY 2001 subproject under the Multiprogram Energy Laboratories Infrastructure Project (MEL-001). The FY 2002 funding is for design activities for the following projects: Laboratory Systems Upgrade at PNNL ($880,000); and Research Support Center at ORNL ($1,500,000). The FY 2001 subproject is the Laboratory Facilities HVAC Upgrade at ORNL ($3,000,000).

Environment, Safety and Health **4,600** **12,979** **16,416**

Provides funding to support the initiation of one new ES&H subproject in FY 2002, as well as the continuation of four FY 2001 subprojects under the Multiprogram Energy Laboratories Infrastructure

(dollars in thousands)

FY 2000	FY 2001	FY 2002

Project (MEL-001). The FY 2002 funding for the new start is for design activities for the Mechanical and Control Systems Upgrade – Phase I at ANL-E ($803,000). The FY 2001 subprojects are: Groundwater and Surface Water Protection Upgrades at BNL ($2,763,000); Fire Protection System Upgrade at ORNL ($ 3,120,000); Site-wide Water Distribution System Upgrade at LBNL ($4,400,000); and Electrical Systems Modifications - Phase II at BNL ($3,300,000). The request also supports the completion of Fire Safety Improvements - Phase IV at ANL-E ($2,030,000).

Infrastructure Support	**2,160**	**1,020**	**1,020**
■ **Payment in Lieu of Taxes (PILT)**	2,160	1,020	1,020

Continue meeting Payments in Lieu of Taxes (PILT) assistance requirements for communities surrounding Brookhaven National Laboratory and Argonne National Laboratory-East. **Performance will be measured** by the Department funding the PILT payments at the levels negotiated with the local governments. The PILT payments equaled the negotiated levels in FY 2000.

Total, Multiprogram Energy Laboratories – Facilities Support	**21,255**	**22,815**	**22,816**

Explanation of Funding Changes from FY 2001 to FY 2002

	FY 2002 vs. FY 2001 ($000)
Multiprogram Energy Laboratories – Facilities Support	
■ Continue at FY 2001 level	+1
Total Funding Change, Multiprogram Energy Laboratories - Facilities Support	+1

Oak Ridge Landlord

Mission Supporting Goals and Objectives

This subprogram supports landlord responsibilities for the centralized Oak Ridge Operations Office (ORO) 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), and DOE facilities in the town of Oak Ridge. This includes roads and grounds and other infrastructure maintenance, ES&H support and improvements, support for the emergency management operations, support of the Oak Ridge Financial Service Center, PILT for Oak Ridge communities, and other technical needs related to landlord requirements. These activities maintain continuity of operations at the Oak Ridge Reservation and the ORO and minimize interruptions due to infrastructure or emergency management and other systems failures. **Performance will be measured** by the number of significant ORO interruptions which can be directly attributed to infrastructure failures. In FY 2000 there were no significant interruptions due to infrastructure failures.

Funding Schedule

(dollars in thousands)

	FY 2000	FY 2001	FY 2002	$ Change	% Change
Oak Ridge Landlord	8,302	7,359	7,359	0	--

Detailed Program Justification

(dollars in thousands)

	FY 2000	FY 2001	FY 2002
■ **Roads, Grounds and Other Infrastructure and ES&H Support and Improvements**	2,180	2,200	2,200
■ **Emergency Management Program Office**	1,223	664	664
Provides for the operation of the Oak Ridge Emergency Operations Center and the Communications and Operations Center.			
■ **Payments in Lieu of Taxes (PILT)**	1,916	1,900	1,900
Payments in Lieu of Taxes (PILT) to the City of Oak Ridge, and Anderson and Roane Counties.			
■ **American Museum of Science and Energy**	400	0	0
FY 2000 is the last year direct support for the museum is provided. Museum operation was transferred to ORNL where alternative funding mechanisms are being developed, including support by private or industrial partners, and, possibly, an admission fee for adults.			

(dollars in thousands)

	FY 2000	FY 2001	FY 2002
■ **Oak Ridge Financial Service Center**	1,635	1,700	1,700
Provides computer and systems support to the Center which serves other DOE field offices as well as Oak Ridge.			
■ **Technical Support**	948	895	895
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.			
Total, Oak Ridge Landlord	**8,302**	**7,359**	**7,359**

Explanation of Funding Changes from FY 2001 to FY 2002

	FY 2002 vs. FY 2001 ($000)
Oak Ridge Landlord	
■ No changes from FY 2001 to FY 2002.	

Capital Operating Expenses & Construction Summary

Capital Operating Expenses

(dollars in thousands)

	FY 2000	FY 2001	FY 2002	$ Change	% Change
General Plant Projects	0	200	0	-200	-100.0%
Capital Equipment	100	315	315	0	--
Total, Capital Operating Expenses	100	515	315	-200	-38.8%

Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior Year Approp-riations	FY 2000	FY 2001	FY 2002	Unapprop. Balance
Project – 02-SC-001 Multiprogram Energy Laboratories Infrastructure Project FY 2002 PED Datasheet	N/A	N/A	0	0	3,183	0
Project - MEL-001 Multiprogram Energy Laboratories Infrastructure Project FY 2002 Construction Datasheet	N/A	N/A	18,351	21,795	18,613	13,029
Total, MELFS Construction	N/A	N/A	19,095 [a]	21,795	21,796	13,029

[a] Total MELFS construction, including projects fiscally completed prior to FY 2001. Includes $744 to complete funding for project 94-E-363, Roofing Improvements (ORNL).

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

(Changes from FY 2001 Congressional Budget Request are denoted with a vertical line in the left margin.)

Significant Changes

The scope on the Building 77-Rehabilitation of Building Structure and Systems project was reduced to eliminate the mechanical, electrical and architectural work from the project. This leaves only the structural work which will arrest the differential settling and reinforce the lateral force resisting system of the building. This reduction was necessitated by the original bids for construction being significantly higher than expected due to a tight labor market, work difficulty and location, and operational commitments in the facility that limited the work site availability. The rescoping of the project has added seven months to the project schedule.

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
Construction			
Prior Years	10,383	10,383	3,916
FY 2000	18,351	18,351	17,789
FY 2001	21,795	21,795	22,303
FY 2002	18,613	18,613	17,631
FY 2003	13,029	13,029	19,477
FY 2004	0	0	1,055

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 deteriorated steam lines, environmental insult, fire safety improvements, sanitary system upgrades and electrical system replacements.

General Purpose Facility Projects:

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

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates
5,730	849	3,881	1,000	0	0	2Q 2000 - 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.

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

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates
8,000	754	6,133	1,113	0	0	3Q 2000 - 2Q 2002

This project will rehabilitate Building 77's structural system to restore lateral force resistance and arrest differential foundation settlement. These upgrades will restore this 33 year-old, 68,000 sq.ft. building to acceptable seismic performance and prevent loss at this facility due to structure failures.

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

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates

5,900	1,860	3,380	660	0	0	3Q 2000 - 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.

d. Subproject 08 - Electrical Systems Upgrade (ORNL)

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates
5,900	0	357	5,543	0	0	3Q 2001 - 2Q 2003

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.

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

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates
7,100	0	0	500	3,000	3,600	3Q 2002 – 2Q 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 03 - Electrical Systems Upgrade - Phase III, (ANL-E)

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates
7,620	6,420	1,200	0	0	0	2Q 1999 - 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.

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

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates
6,500	500	3,000	3,000	0	0	1Q 2000 - 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.

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

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates
8,381	0	400	5,951	2,030	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 personnel and/or damage to DOE property in case of fire.

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

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates
8,300	0	0	1,000	4,400	2,900	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 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.

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

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates
6,050	0	0	1,889	2,763	1,398	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 DHS Article 12 upgrades.

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

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates
5,920	0	0	584	3,120	2,216	3Q 2002 - 4Q 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.

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

TEC	Prev.	FY 2000	FY 2001	FY 2002	Outyear	Construction Start/ Completion Dates
6,770	0	0	555	3,300	2,915	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 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

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

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.

02-SC-001 - Multiprogram Energy Laboratories, Project Engineering Design (PED), Various Locations

1. Construction Schedule History

Fiscal Quarter				Total Estimated 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
2002	3,183	3,183	2,385
2003	0	0	798

3. Project Description, Justification and Scope

This project funds PED for 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 Environment, Safety and Health (ES&H) deficiencies including deteriorated steam lines, environmental insult, fire safety improvements, sanitary system upgrades and electrical system replacements.

This PED data sheet requests design funding for three FY 2002 new starts. The following three new projects that will be started in FY 2002 are: Mechanical and Control Systems Upgrade – Phase I at Argonne National Laboratory – East; Laboratory Systems Upgrades at Pacific Northwest National Laboratory; and Research Support Center at Oak Ridge National Laboratory.

FY 2002 Proposed Design Projects

General Purpose Facility Projects:

02 -01: MEL-001-018 – Laboratory Systems Upgrades (PNNL)

Fiscal Quarter				Total Estimated Cost (Design Only) ($000)	Full Total Estimated Cost Projection [a] ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2002	3Q 2002	2Q 2003	N/A	880	9,000

Fiscal Year	Appropriations	Obligations	Costs
2002	880	880	660
2003	0	0	220

This design project will provide design to upgrade or replace 20-50 year old mechanical system components in eight high occupancy facilities at PNNL. This project will upgrade these obsolete systems with more efficient, 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; and replacement of an emergency power generator.

02 -03: MEL-001-025 – Research Support Center (ORNL)

Fiscal Quarter				Total Estimated Cost (Design Only) ($000)	Full Total Estimated Cost Projection [a] ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2002	3Q 2002	2Q 2004	N/A	1,500	16,100

Fiscal Year	Appropriations	Obligations	Costs
2002	1,500	1,500	1,125
2003	0	0	375

This design 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, cafeteria, visitor reception and control area, and support offices for approximately 50 occupants. It will facilitate consolidation of functions which are presently scattered throughout the Laboratory complex in facilities that

[a] The full TEC Projection (design and construction) is a preliminary estimate based on conceptual data and should not be construed as a project baseline.

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 the 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 lab now undergoing decontamination. The estimated simple payback is seven years.

ES&H Projects:

02-08: MEL-001-017 – Mechanical and Control Systems Upgrade – Phase I (ANL-E)

Fiscal Quarter				Total Estimated Cost (Design Only) ($000)	Full Total Estimated Cost Projection [a] ($000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2002	3Q 2002	2Q 2003	NA	803	9,000

Fiscal Year	Appropriations	Obligations	Costs
2002	803	803	600
2003	0	0	203

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 Bldgs. 221 and 362, including heating and cooling coils, fans, filter systems, ductwork, controls, and variable frequency drive fans; upgrade lab exhaust systems in Bldgs. 202 and 306, including new fans, ductwork, and controls; upgrade corroded drainage systems in Bldgs. 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

[a] The full TEC Projection (design and construction) is a preliminary estimate based on conceptual data and should not be construed as a project baseline.

Design services will be obtained through competitive and/or negotiated contracts. M&O contractor staff may be utilized in areas involving security, production, proliferation, etc. concerns.

6. Schedule of Project Funding

N/A