

DEPARTMENT OF ENERGY
FY 1991 CONGRESSIONAL BUDGET REQUEST
ENERGY SUPPLY RESEARCH AND DEVELOPMENT

OVERVIEW

MULTIPROGRAM ENERGY LABORATORIES-FACILITIES SUPPORT

Attaining the energy R&D goals articulated in the National Energy Policy Plan (NEPP) involves significant use of the five DOE national laboratories supported by Energy Research. These are: Argonne National Laboratory (ANL), Brookhaven National Laboratory (BNL), Lawrence Berkeley Laboratory (LBL), Oak Ridge National Laboratory (ORNL), and Pacific Northwest Laboratory (PNL). DOE has a statutory responsibility to maintain the well-being of the national resource which these five laboratories represent. The replacement value of the facilities at these laboratories is \$2.8 billion and they perform over \$1 billion per year of mission R&D for the Department.

The MEL-FS program objective is to adequately maintain the capabilities of these laboratories to carry out their respective missions in accordance with relevant regulations and DOE orders. This is accomplished by supporting activities and projects which counter the problems of (1) aging and obsolescence of facilities, and (2) safety and health inadequacies. The program is fully integrated with the Department's planning process such as the institutional planning processes which overviews the overall management and utilization of the multiprogram laboratories.

The strategy of the program is to select and support activities and projects necessary to: (1) maintain operations of the laboratories in a safe, cost effective, and productive manner; and (2) reduce the backlog of facility deficiencies. Budgetary constraints, being experienced throughout the entire Federal government, have necessitated the selection and support of activities/projects critical to safe operation and necessary to ensure continued laboratory viability.

The benefits to be gained by supporting the levels in this budget request are: uninterrupted operation of the laboratories; decreased operating costs; improved safety, security, and environmental compliance levels; reduced health risks; and, improved productivity.

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LEAD TABLE

Multiprogram Energy Laboratories - Facilities Support

Activity	FY 1989 Actual	FY 1990 Estimate	FY 1991 Base	FY 1991 Request	Program Change Request vs Base	
					Dollar	Percent
General Purpose Facilities						
Construction.....	\$24,387	\$22,123	\$22,123	\$23,743	\$ + 1,616	+ 7%
Total.....	\$24,387 a/	\$22,123 a/b/	\$22,123 a/	\$23,743	\$ + 1,616	+ 7%
Operating.....	\$0	\$0	\$0	\$0	\$0	\$0
Capital Equipment.....	\$0	\$0	\$0	\$0	\$0	\$0
Construction.....	(24,387)	(22,125)	(22,123)	(23,743)	+ 1,616	+ 7%

Authorization: Section 647, P.L. 95-91.

a/ Reflects comparability adjustment for Environmental Restoration as follows; FY 1989-\$31,343,000;
 FY 1990-\$29,632,000; FY 1991-\$32,117,000.

b/ FY 1990 reflects final Gramm-Rudman-Hollings sequester adjustments.

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SUMMARY OF CHANGES

Multiprogram Energy Laboratories - Facilities Support

FY 1990 Appropriation.....	\$ 22,123
- Maintain general purpose facilities projects on planned schedule.....	+ 1,616
FY 1991 Congressional Budget Request.....	<u>\$ 23,743</u>

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KEY ACTIVITY SUMMARY

MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT

I. Preface: General Purpose Facilities

This subprogram originated in FY 1981 as a broad program for rehabilitation, upgrade or replacement of deficient buildings, utilities, roads, railroads and other facilities and addressing ES&H deficiencies at the laboratories. The backlog of deficiencies is currently estimated at \$700 million at the five multiprogram energy laboratories. These Government-owned sites are complete research reservations with advanced major scientific instrumentation and exceptional, often unique, research facilities with all necessary support facilities. These laboratories have performed national research programs for the Department and its predecessor agencies for nearly 40 years. They received over \$1,000,000,000 in FY 1986 to perform national research and development programs. Over 17,000 scientists, engineers and other support staff are engaged in these activities. The productivity of the work force is greatly affected by the adequacy of the laboratories facilities.

The replacement costs of the existing government owned support facilities at five multiprogram energy laboratories exceed \$2,800,000,000. Through continuous use and aging, as well as changing technology, these facilities deteriorate (both physically and in performance) to a point where they are no longer appropriate for their intended functions, economically justifiable to maintain, or adequate to meet security, safety, and health requirements. This subprogram addresses these requirements, as well as the large backlog of facility needs in a prioritized and systematic manner. Highest priority is assigned to those projects that address urgent safety, health and security deficiencies and those that can hamper or interrupt operations. The latter is primarily concerned with utilities - electrical, heating and cooling, water supply, waste disposal, etc. Next highest priority are those projects that concern efficiency and productivity of operations, such as providing adequate laboratory space, warehouse and shop facilities. Facility upgrade plans and all proposed projects and subprojects are consistent with the Institutional Plans and Site Development Plans for these laboratories.

As a result of DOE policy on management of environmental cleanup, all environmental projects that would have normally been funded by the General Purpose Facilities subprogram are now reassigned to one of the subprograms discussed subsequently in the Multiprogram Energy Laboratories - Facilities Support budget.

This program will help ensure the continued effective accomplishment of the Department's R&D missions today and in the future. The Multiprogram Energy Laboratories-Facilities Support program is an appropriate Federal role reflecting the responsible management of the Government's real property.

II. A. Summary Table

Program Activity	FY 1989 Actual	FY 1990 Estimate	FY 1991 Request	% Change
General Purpose Facilities...	\$ 24,387	\$ 22,123	\$ 23,743	+ 7%

II. B. Major Laboratory and Facility Funding

Argonne National Laboratory....	\$ 7,985	\$ 6,736	\$ 4,460	- 34%
Brookhaven National Laboratory.	4,247	5,841	4,566	- 22%
Hanford Engineering Development Laboratory*.....	375	0	0	--
Idaho National Engineering Lab*.	488	393	0	- 100%
Lawrence Berkeley Laboratory....	4,381	5,247	8,212	+ 56%
Lawrence Livermore Nat. Lab*....	312	0	0	--
Oak Ridge National Laboratory..	4,539	3,906	6,505	+ 67%
Pacific Northwest Laboratory...	2,060	0	0	--
Total.....	\$ 24,387	\$ 22,123	\$ 23,743	+ 7%

* This program is no longer responsible for these laboratories, but is committed to completing any projects it started at these laboratories under its previous responsibility. These labs are now the responsibility of DOE Defense Programs and Nuclear Energy.

III. Activity Descriptions

Program Activity	FY 1989	FY 1990	FY 1991
Construction	Will provide for continuation of 6 ongoing projects (\$21,117) consistent with planned schedules and initiation of 3 new projects: 1 road safety	Will provide for continuation of 9 ongoing projects (\$15,344) consistent with planned schedules and initiation of 11 projects some of	Will provide for completion and continuation of all ongoing projects consistent with planned schedule. (\$23,743)

III. General Purpose Facilities (Cont'd)

Program Activity	FY 1989	FY 1990	FY 1991
Construction (Cont'd)	project, 1 fire protection project, and 1 utility project. (\$3,270)	which had been postponed from FY 1989. (\$6,779)	
Total General Purpose Facilities	\$24,387	\$22,123	\$23,743

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KEY ACTIVITY SUMMARY

CONSTRUCTION PROJECTS

Multiprogram Energy Laboratories - Facilities Support

IV. A. Construction Project Summary

<u>Project No.</u>	<u>Project Title</u>	<u>Total Prior Year Obligations</u>	<u>FY 1990 Approp.</u>	<u>FY 1991 Request</u>	<u>Unappropriated Balance</u>	<u>TEC</u>
<u>Multiprogram Energy Laboratories - General Purpose Facilities</u>						
90-R-121	Rehabilitation of Domestic and Firewater, Pumping and Storage Systems (ANL)	0	148	1,000	527	1,675
90-R-118	Fire Protection Upgrade (ORNL)	0	1,321	1,960	19	3,300
90-R-117	Slope/Seismic Stabilization (LBL)	0	493	2,200	1,007	3,700
90-R-113	Electrical Systems Upgrade (ORNL)	0	843	1,445	12	2,300
90-R-112	Measurements and Controls Support Facility (ORNL)	0	884	3,100	446	4,430
90-R-111	Original Labsite Substation (LBL)	0	247	2,400	303	2,950
90-R-110	Instrumentation Support Laboratory Rehabilitation (LBL)	0	197	1,800	3	2,000
90-R-109	Building Addition (BNL)	0	1,676	0	24	1,700
90-R-108	Central Shops Alteration and Addition (BNL)	0	306	1,370	4	1,680
90-R-107	Boiler Replacement (BNL)	0	319	3,196	5	3,520

<u>Project No.</u>	<u>Project Title</u>	<u>Total Prior Year Obligations</u>	<u>FY 1990 Approp.</u>	<u>FY 1991 Request</u>	<u>Unappropriated Balance</u>	<u>TEC</u>
90-R-100	Transportation Facility Replacement (ANL)	0	345	1,400	2,355	4,100
89-R-112	PCB Transformers (ANL)	975	478	0	7	1,460
89-R-108	Roads and Parking Safety Improvements (ORNL)	1,650	858	0	12	2,520
89-R-102	Fire Protection Improvements Phase II (BNL)	645	2,322	0	33	3,000
88-R-807	Electrical System Rehabilitation Phase I (ANL)	1,500	2,662	860	38	5,060
88-R-806	Environmental Health and Safety Project (LBL)	3,366	4,310	1,512	62	9,250
88-R-805	Environmental Improvements (BNL)	2,258	1,218	0	18	3,494
87-R-756	Water Line Replacement (ANL)	4,663	529	0	8	5,200
87-R-753	Rehabilitate Laboratory Space (ANL)	7,924	2,574	1,500	37	12,035
84-ER-103	Road Repairs (INEL, LBL, RL, ANL)	<u>17,352</u>	<u>393</u>	<u>0</u>	<u>6</u>	<u>17,751</u>
	Subtotal, General Purpose Facilities	40,333	22,123	23,743	4,926	XXXX
	Total Multiprogram Energy Laboratories - Facilities Support	40,333	22,123	23,743	4,926	XXXX

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Multiprogram Energy Laboratories - Facilities Support
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 90-R-121 Rehabilitation of domestic and firewater, pumping and storage system, Argonne National Laboratory (ANL) Argonne, Illinois
- Project TEC: \$ 1,675
 Start Date: FY 1990
 Completion Date: FY 1992

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$148	\$148	\$140
1991	\$1,000	\$1,000	\$500
1992	\$527	\$527	\$525
1993	\$ 0	\$ 0	\$510

3. Narrative:

- (a) This project provides for the rehabilitation of eleven surface and elevated water storage tanks and eight pressure filter tanks located throughout the ANL site. This project also provides for rehabilitation of three well water pumps through overhaul of the motors, pump assemblies and line shafts and well castings.
- (b) Present conditions are causing increased maintenance costs and system downtime and having a potential of impairing the laboratory's ability to respond properly to a fire emergency during these downtimes. The well water pumps have operated for 20-35 years. Two of these pumps provide over 50% of the water supply for the laboratory's drinking, fire protection, heating and research process operations. The fire water pump has operated for more than 30 years. Most of the parts are worn out and the housing indicated heavy corrosion.
- (c) \$1,000,000 is requested for FY 1991 funding. Construction will be underway.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 148	\$ 1,000	\$ 527
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 90-R-118 Fire protection upgrade Project TEC: \$ 3,300
 Oak Ridge National Laboratory Start Date: FY 1990
 Oak Ridge, Tennessee Completion Date: FY 1993

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$1,321	\$1,321	\$ 500
1991	1,960	1,960	1,100
1992	19	19	1,500
1993	0	0	200

3. Narrative:

- (a) This project upgrades fire protection and life safety installations in key facilities at the Oak Ridge National Laboratory.
- (b) The lack of automatic fire suppression sprinkler systems in occupied office areas and service areas in the main building wings of the ORNL Central Research and Administration Building presents a serious risk of a multi-million dollar fire loss and major interruption of program activities.
- (c) \$1,960,000 is requested in FY 1991. Construction will be initiated.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 1,321	\$ 1,960	\$ 19
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 90-R-117 Slope and Seismic Stabilization Above the Bevatron, Building 51, and Mechanical Shops, Building 77
 Lawrence Berkeley National Laboratory
 Berkeley, California

Project TEC: \$ 3,700
 Start Date: FY 1990
 Completion Date: FY 1993

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$ 493	\$ 493	\$ 220
1991	2,200	2,200	1,510
1992	1,007	1,007	1,600
1993	0	0	370

3. Narrative:

- (a) This project consists of planning, design and construction of two lateral support systems to stabilize two known landslide areas.
- (b) This project will complete a long-term program at LBL which has succeeded in stabilizing other known landslide areas that could cause significant property damage in the event of a strong earthquake or static movement due to excessive soil moisture.
- (c) \$2,200,000 is requested in FY 1991. Construction will be initiated.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 493	\$ 2,200	\$ 1,007
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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Multiprogram Energy Laboratories - Facilities Support
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 90-R-113 Electrical systems upgrade, Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee Project TEC: \$ 2,300
 Start Date: FY 1990
 Completion Date: FY 1991

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$ 843	\$ 843	\$ 200
1991	\$1,445	\$1,445	\$1,100
1992	\$ 12	\$ 12	\$1,000

3. Narrative:

- (a) This project will replace aged, obsolete, and unreliable equipment and hardware in the ORNL electrical system.
- (b) The purpose of this project is the restoration of deteriorated distribution lines and the replacement of old and obsolete equipment needed to ensure a reliable source of electrical power as well as to meet the demands of the continuing research programs at ORNL.
- (c) \$1,445,000 is requested for FY 1991 funding. Construction will be underway.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 843	\$ 1,445	\$ 12
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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Multiprogram Energy Laboratories - Facilities Support
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 90-R-112 Measurements and controls support facility, Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee
- Project TEC: \$4,430
 Start Date: FY 1990
 Completion Date: FY 1992

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$ 884	\$ 884	\$ 800
1991	\$3,100	\$3,100	\$1,630
1992	\$ 446	\$ 446	\$2,000

3. Narrative:

- (a) This project will construct a two-story building providing approximately 20,000 sq. ft. in the Instruments and Controls complex.
- (b) The purpose of this project is to provide adequate space and facilities for essential support personnel and functions presently located in a deteriorated wooden building and in converted laboratories and storage rooms in the ORNL complex.
- (c) \$3,100,000 is requested for FY 1991 funding. Construction will be underway.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 884	\$ 3,100	\$ 446
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support
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IV. B. Plant Funded Construction Project

1. Project title and location: 90-R-111 Original labsite
 substation, Lawrence
 Berkeley Laboratory (LBL),
 Berkeley, California
- Project TEC: \$ 2,950
 Start Date: FY 1990
 Completion Date: FY 1992

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$ 247	\$ 247	\$ 150
1991	\$2,400	\$2,400	\$ 930
1992	\$ 303	\$ 303	\$1,870

3. Narrative:

- (a) This project is the second of several elements to improve the reliability of the electrical distribution system of the entire laboratory. It will install a new substation and provide for new distribution circuits to laboratory facilities.
- (b) Current and future programmatic activities require reliable and economic power. The existing electrical distribution system is 40 years old. Deterioration of distribution cables and switching equipment has resulted in power outages and interruption of programmatic activities.
- (c) \$2,700,000 is requested for FY 1991 funding. Construction will be underway in FY 1991.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 247	\$ 2,400	\$ 303
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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Multiprogram Energy Laboratories - Facilities Support
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IV. B. Plant Funded Construction Project

1. Project title and location: 90-R-108 Central shops alteration and addition, Brookhaven National Laboratory (BNL), Upton, New York

Project TEC: \$ 1,680
 Start Date: FY 1990
 Completion Date: FY 1991

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$306	\$306	\$300
1991	\$1,370	\$1,370	\$1,376
1992	\$ 4	\$ 4	\$ 4

3. Narrative:

- (a) This project provides for the construction of a new building having a gross area of about 11,400 sq. ft. and an approximate volume of 185,000 cubic feet. It will provide for the construction of a new addition to the existing Heavy Machine Shop.
- (b) The Central Shops Division currently has its welding operations contained in various World War II wooden buildings, most of which were not designed for their current use. This project will consolidate these operations into appropriately designed noncombustible facilities which will result in much safer and efficient operations. The existing building will be demolished.
- (c) \$1,370,000 is requested for FY 1991 funding. Construction will be completed.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 306	\$ 1,370	\$ 4
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0
			454		

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Multiprogram Energy Laboratories - Facilities Support
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 90-R-107 Boiler replacement,
 Brookhaven National Laboratory (BNL), Upton,
 New York
- Project TEC: \$ 3,520
 Start Date: FY 1990
 Completion Date: FY 1992

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$319	\$319	\$200
1991	\$3,196	\$3,196	\$770
1992	\$5	\$5	\$2,550

3. Narrative:

- (a) This project provides for the installation of a new boiler, of about 125,000 lbs. per hour, at the Central Steam Facility.
- (b) The boiler replacement is required to assure adequate firm capacity to meet the laboratory's 1991 steam demands.
- (c) \$3,196,000 is requested for FY 1991 funding. Construction will be underway.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 319	\$ 3,196	\$ 5
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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IV. B. Plant Funded Construction Project

1. Project title and location: 90-R-100 Transportation facility replacement, Argonne National Laboratory (ANL), Argonne, Illinois
- Project TEC: \$ 4,100
 Start Date: FY 1990
 Completion Date: FY 1992

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$345	\$345	\$150
1991	\$1,400	\$1,400	\$1,470
1992	\$2,355	\$2,355	\$2,480

3. Narrative:

- (a) This project will provide a new building to house the activities of the Transportation and Grounds Service groups at ANL's Illinois site. The facility will centralize the Vehicle Maintenance and Repair, Driving and Rigging, and Grounds Maintenance activities into one facility.
- (b) The purpose of this project is to relocate and consolidate the site's Transportation and Grounds Maintenance operations to correct existing facility deficiencies and provide an efficient centralized operational base. All existing facilities which are quonset buildings constructed to serve as temporary quarters during construction of Argonne in 1948 will be demolished.
- (c) \$1,400,000 is requested for FY 1991 funding. Construction will be underway.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 345	\$ 1,400	\$ 2,355
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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IV. B. Plant Funded Construction Project

1. Project title and location: 88-R-807 Electrical System Rehabilitation, Phase I Project TEC: \$ 5,060
 Argonne National Laboratory (ANL) Start Date: FY 1988
 Argonne, Illinois Completion Date: FY 1991

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 350	\$ 350	\$ 47
1989	1,150	1,150	345
1990	2,662	2,662	2,990
1991	860	860	800
1992	38	38	878

3. Narrative:

(a) This project provides for the replacement of components of the main electrical distribution system including transformers, voltage regulators, circuit breakers, metering and relaying equipment, poles, cross arms, insulators, down-guys and related hardware. The project also provides oil containment structures for oil transformers in accordance with current federal/state EPA regulations.

(b) Electrical reliability is essential to continuity of laboratory operations. This project will help ensure uninterrupted operations by replacing transformers and other critical electrical equipment which are beyond their predicted life expectancy. Replacing them before failure will avoid costly and disruptive emergency repairs. Oil containment structures will bring existing operations into compliance with environmental regulations.

(c) \$860,000 is requested for FY 1991 funding to complete this project.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991 Request</u>	<u>To Complete</u>
Construction.....	\$ 350	\$ 1,150	\$ 2,662	\$ 860	\$ 38
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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Multiprogram Energy Laboratories - Facilities Support
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 88-R-806 Environmental Health & Safety Project Project TEC: \$ 9,250^{a/}
 Lawrence Berkeley Laboratory Start Date: FY 1988
 Berkeley, California Completion Date: FY 1991

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 850	\$ 850	\$ 59
1989	2,516	2,516	580
1990	4,310	4,310	1,998
1991	1,512	1,512	3,844
1992	62	62	2,769

3. Narrative:

- (a) This project will consist of several subprojects in the following areas: 1) upgrading and/or installing environmental monitoring equipment (air sampling/monitoring and underground fuel tank monitoring); 2) replacing existing deteriorated safety and health equipment (ventilation improvements and replacing drum storage racks); and 3) installing additional health and safety equipment, facilities and systems (area lighting and chemical storage facility).
- (b) Ensuring healthy, safe and environmentally sound operations is a major goal at LBL. This project is needed to comply with state and national environmental requirements and safety and health standards.
- (c) \$1,512,000 is requested for FY 1991 funding to complete this project.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991 Request</u>	<u>To Complete</u>
Construction.....	\$ 850	\$ 2,516	\$ 4,310	\$ 1,512	\$ 62
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

^{a/} Remaining balance of \$1,075,000 transferred to new Office of Environmental Management.

DEPARTMENT OF ENERGY
 FY 1991 CONGRESSIONAL BUDGET REQUEST
 OFFICE OF ENERGY RESEARCH
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 87-R-753 Rehabilitate Laboratory Space Project TEC: \$12,035
 Argonne National Laboratory (ANL) Start Date: FY 1987
 Argonne, Illinois Completion Date: FY 1991

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1987	\$ 1,235	\$ 1,235	\$ 521
1988	3,889 ^{a/}	3,889 ^{a/}	1,354
1989	2,800	2,800	1,992
1990	2,574	2,574	4,208
1991	1,500	1,500	3,007
1992	37	37	953

3. Narrative:

- (a) This project will renovate six laboratory/office wings (166,000 gross square feet) of Building 200, a multipurpose laboratory and office building in the central part of the ANL site. The project will: 1) replace or upgrade the electrical distribution and lighting systems, the heating, ventilation and air conditioning systems and the plumbing and piping systems; and 2) repair and upgrade the building envelope (especially windows) and building interiors (ceiling, walls and doors).
- (b) Building 200 has been in continuous use since its construction in 1951. There has been no renovating or reconditioning of this space since its construction so building systems have deteriorated and are not fully reliable or effective. The facility does not meet current construction codes and safety standards.
- (c) \$1,500,000 is requested for FY 1991 funding to complete this project.

4. Total Project Funding (BA):	<u>Prior</u> <u>Years</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991</u> <u>Request</u>	<u>To Complete</u>
Construction.....	\$ 5,124	\$ 2,800	\$ 2,574	\$ 1,500	\$ 37
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

^{a/} \$289,000 reprogrammed from prior year closed out projects.

DEPARTMENT OF ENERGY
FY 1991 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS
ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (Tabular dollars in thousands. Narrative Material in Whole dollars.)

1. Title and location of project: Rehabilitation of Domestic & Firewater, Pumping & Storage System
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 90-R-121

3. Date A-E work initiated: 1st Qtr. FY 1990

3a. Date physical construction starts: 4th Qtr. FY 1990

4. Date construction ends: 2nd Qtr. FY 1992

5. Previous cost estimate: \$ 1,675
Date: December 1988

6. Current cost estimate: \$ 1,675
Less amount for PE&D: 0
Net cost estimate: \$ 1,675
Date: September 1988

7. Financial Schedule:	Fiscal Year	Authorizations	Appropriations	Obligations	Costs
	1990	\$ 1,675	\$ 148	\$ 148	\$ 140
	1991	0	1,000	1,000	500
	1992	0	527	527	525
	1993	0	0	0	510

8. Brief Physical Description of Project

This project provides for the rehabilitation of eleven (11) surface and elevated water storage tanks and eight (8) pressure filter tanks located throughout the ANL site. The work includes structural reinforcement, sandblasting, cathodic protection and painting of the tanks. The water storage tanks range in capacities from 75,000 to 650,000 gallons. Pressure filter tanks operate at an average capacity of 100 gpm.

This project also provides for rehabilitation of three (3) well water pumps through overhaul of the motors, pump assemblies and line shafts and well casings. This project also provides for replacement of the existing fire water pump.

CONSTRUCTION PROJECT DATA SHEETS

-
1. Title and location of project: Rehabilitation of Domestic & Firewater, Pumping & Storage System
Argonne National Laboratory (ANL)
Argonne, Illinois
2. Project No.: 90-R-121
-

9. Purpose, Justification of Need, and Scope of Project

The water storage tanks provide water for the purposes of drinking, fire protection, cooling and heating, and process make-up in laboratory operations. The pressure filter tanks remove fine suspended matter from the water. These tanks have been in service for 25-35 years. Recent tank inspections have indicated exterior and interior corrosion, pitting, metal reduction and structural chipping (exceeding AWWA allowable limits) to the foundations, riser, tower and tanks. The drinking water quality is declining as interior tank metal surfaces corrode and become dissolved in the main water supply system. Furthermore, the tanks, ladders, and platforms are not in compliance with current OSHA Standards.

Present conditions are causing increased maintenance cost and system downtime and having a potential of impairing the laboratory's ability to respond properly to a fire emergency during these downtimes.

The well water pumps have operated for 20-35 years. Two of these pumps provide over 50% of the water supply for the laboratory's drinking, fire protection, heating and research process operations. Well inspections have indicated declining water levels in the aquifer supply and considerable decline in hydraulic pumping capacity from pump wear over time. These two conditions have caused an inadequate plant water supply resulting in increased operating and maintenance costs and the potential of threatening the laboratory's ability to operate efficiently. Furthermore, only one pump is equipped for stand-by emergency power in the event of a system power failure. Since this power source is undersized for rated pumping conditions, a new generator is required to ensure the laboratory of a dependable water source during a site-wide power outage.

The fire water pump has operated for more than 30 years. Most of the parts are worn out and the housing indicated heavy corrosion. This condition has resulted in an unreliable source of water for sprinkler system and the house outlets for the coal bunkers.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Rehabilitation of Domestic & Firewater, Pumping & Storage System Argonne National Laboratory (ANL) Argonne, Illinois	2. Project No.: 90-R-121
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10. <u>Details of Cost Estimate</u> *	<u>Total Cost</u>
a. Engineering, design and inspection 12% of b	\$ 182
b. Construction.....	1,215
Subtotal.....	1,397
c. Contingency @ 20% of above costs.....	278
Total estimated project cost.....	\$1,675

* Based upon a completed conceptual design and current cost data. Cost escalation rate for 1987 - 1.1%; for 1987 - 2.5%; for 1988 - 4.0% for 1989 - 4.8%; for 1990 - 5.3%; and for 1991 - 5.6%.

11. Method of Performance

Engineering, design and inspection will be performed by laboratory engineering personnel, aided by outside A/E firms. Construction will be accomplished by fixed-price contract awarded on the basis of competitive bidding.

DEPARTMENT OF ENERGY
FY 1991 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS
ENERGY SUPPLY RESEARCH & DEVELOPMENT - PLANT & CAPITAL EQUIPMENT
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and Location of Project: Fire protection upgrade
Oak Ridge National Laboratory, Tennessee

2. Project Number: 90-R-118

3. Date A-E Work Initiated: 1st Qtr. FY 1990

3a. Date physical construction starts: 2nd Qtr. FY 1991

4. Date Construction: 2nd Qtr. FY 1993

5. Previous Cost Estimate: None

6. Current Cost Estimate: \$3,300
 Less Amount for PE&D: 0
 Net Cost Estimate: \$3,300
 Date: September 1988

<u>7. Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 3,300	\$ 1,321	\$ 1,321	\$ 500
	1991	0	1,960	1,960	1,100
	1992	0	19	19	1,500
	1993	0	0	0	200

8. Brief Physical Description of Project

This project upgrades fire protection and life safety installations in key facilities at the Oak Ridge National Laboratory (ORNL). Approximately one-half million sq. ft. of presently unprotected and inadequately protected building space in the Central Research and Administration Building and in the ORNL Atomic Physics Complex will be provided with appropriate new and upgraded fire protection and life safety capabilities.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Fire protection upgrade
Oak Ridge National Laboratory, Tennessee

2. Project Number: 90-R-118

8. Brief Physical Description (continued)

This project will reduce the fire loss risk in the Central Research and Administration Building by providing the following: (1) installation of wet pipe fire suppression sprinklers in presently unprotected office areas and associated corridor space; (2) conversion of existing preaction sprinkler systems and associated sensing and detection devices; and (4) installation of positive ventilation in the Chemical Stores Area. Cleanup of asbestos contamination in some areas will precede installation of sprinkler and fire alarm components in these areas.

A new underground water line utilizing pipe up to 16-inches in diameter, and strategically located fire hydrants, will be constructed to extend through the ORNL Atomic Physics Complex to ensure a supply of fire protection water for the buildings comprising the complex.

First year funding for the project will provide for engineering of the project and preliminary construction activities.

9. Purpose, Justification of Need, and Scope of Project:

The purpose of this project is to rectify major fire protection and life safety deficiencies identified during Factory Mutual Research Corporation (FM) surveys of ORNL facilities conducted in 1973, 1977 and 1985, and to improve the risk level of fire protection.

The lack of automatic fire suppression sprinkler systems in occupied office areas and service areas in the main building and building wings of the ORNL Central Research and Administration Building presents a serious risk of a multi-million dollar fire loss and major interruption of program activities. DOE Order 5480.1 requires automatic fire suppression sprinkler systems to limit property loss, and the Factory Mutual Research Corporation (FM) surveys of ORNL facilities recommended this protection in their three survey reports of 1973, 1977, and 1985.

The preaction fire suppression sprinkler systems, presently protecting occupied and storage areas in the wings of the Central Research and Administration Building, have become inappropriate due to changes, over time, in area utilization. Conversion of these spaces to offices and storage of records and documents in the "attic" areas require a faster sprinkler response, at lower temperatures due to the type and nature of combustibles in the areas to be protected. The conversion to wet-pipe systems would eliminate maintenance-intensive electrical heat detection systems and would actuate fire suppression sprinkler heads at a more appropriate lower temperature.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Fire protection upgrade
Oak Ridge National Laboratory, Tennessee

2. Project Number: 90-R-118

9. Purpose, Justification of Need, and Scope of Project (continued)

The present fire alarm control systems consist of seventeen antiquated master boxes and control panels, distributed throughout the Central Research and Administration Building for annunciating the general location of a fire emergency. Replacement of these seventeen systems with four new systems, strategically located, will reduce the risk to fire personnel in identifying the emergency site and ensure more prompt response to alarms.

The Chemical Stores Area, located centrally in the Main Wing of the Central Research and Administration Building, is the main distribution point for research laboratory chemicals including volatile and flammable organic liquids. Positive ventilation is required to minimize the possibility of flammable vapor accumulations at the floor level from minor leaks or spills of flammable liquids. This action is recommended in the FM survey reports and provides improved risk in accordance with DOE Order 5480.1, Chapter VII.

The ORNL Atomic Physics Complex consists of buildings housing the Holifield Heavy Ion Research Facility (HHIFR), physics laboratories, offices and support systems. It is presently supplied with fire protection water by a single, marginally reliable underground pipeline installed in 1943. The inadequacy of this supply to protect a key ORNL resource was recognized in the FM survey by their recommendation for a pipeline loop for fire protection water. Support for this measure is also provided by DOE Order 5480.1 requiring minimization of property loss risk.

Alternatives

There is no viable alternative for this project to provide the fire protection and life safety measures for over one-half million S.F. of unprotected and marginally protected building space. The replacement cost of this area is estimated to be about \$50 million (based on \$100 per SF), exclusive of equipment and materials, programmatic activity disruptions and the cost of personnel relocation.

Estimated Incremental Operating Costs for Fire Protection Upgrade

The estimated incremental operating cost for the fire protection and life safety installations provided by this project indicate annual savings of approximately \$15,000. These savings are the difference in costs between the expected maintenance and inspection costs for the present systems and those for the new and retrofitted systems.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Fire protection upgrade
Oak Ridge National Laboratory, Tennessee

2. Project Number: 90-R-118

10. Details of Cost Estimate:*

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ approximately 14% of construction costs, item b . . .		\$ 350
b. Construction costs		2,550
(1) Building Modifications	\$2,020	
a. New sprinklers and converted sprinklers	\$1,350	
b. Ventilation modifications	40	
c. New fire alarm systems	630	
(2) Outside Utilities	530	
Subtotal		<u>\$2,900</u>
c. Contingency at approximately 15% of construction costs		<u>400</u>
Total Project Cost		<u>\$3,300</u>

11. Method of Performance

Design and inspection for the fire protection and life safety installation provided by this project shall be performed under a negotiated architect-engineer contract. To the extent feasible, procurement and construction for this project shall be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

*Based on a completed conceptual design.

DEPARTMENT OF ENERGY
FY 1991 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS
ENERGY SUPPLY RESEARCH & DEVELOPMENT - PLANT & CAPITAL EQUIPMENT
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and Location of Project: Slope and Seismic Stabilization Above the Bevatron, Building 51, and Mechanical Shops, Building 77 Lawrence Berkeley Laboratory Berkeley, California
 2. Project Number: 90-R-117

3. Date A-E Work Initiated: 2nd Qtr. FY 1990
 5. Previous Cost Estimate: None
Date: None

3a. Date physical construction starts: 3rd Qtr. FY 1991
 6. Current Cost Estimate: \$ 3,700
Date: September 1988

4. Date Construction Ends: 2nd Qtr. FY 1993

<u>7. Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 3,700	\$ 493	\$ 493	\$ 220
	1991	0	2,200	2,200	1,510
	1992	0	1,007	1,007	1,600
	1993	0	0	0	370

CONSTRUCTION PROJECT DATA SHEETS

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| 1. Title and Location of Project: Slope and Seismic Stabilization Above the Bevatron, Building 51, and Mechanical Shops, Building 77
Lawrence Berkeley Laboratory
Berkeley, California | 2. Project Number: 90-R-117 |
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8. Brief Physical Description

A long-term program at the Lawrence Berkeley Laboratory has succeeded in stabilizing all but two known landslide areas that could cause significant damage in the event of a major earthquake or slide triggering action. The two areas that have low safety factors against sliding are located east of the Bevatron (Building 51) and north of the Mechanical Shops (Building 77) respectively. This project will stabilize these slopes by reinforcing the central portion of each of the two landslides against lateral movement due to static and seismic forces.

This project consists of planning, design and construction of two lateral support systems, one for each of the two landslide areas. These lateral support systems will consist of vertical structure steel columns encased in cast-in-place concrete soldier piles (caissons) with an interconnecting reinforced concrete grade beam and grouted high strength steel tieback anchors. The tie back anchors will slope downward into the hill from the top of the structural steel columns into competent rock beyond the slide plane. Once in place tie backs will be tensioned and grouted. Also included in the project will be a drainage system to reduce hydrostatic pressures which might be imposed by the impedance of water flow caused by the new lateral support system. This will be accomplished by the replacement of disturbed horizontal drains and improvements to the system that presently exists.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Slope and Seismic Stabilization Above the Bevatron, Building 51, and Mechanical Shops, Building 77 Lawrence Berkeley Laboratory Berkeley, California

2. Project Number: 90-R-117

9. Purpose, Justification of Need, and Scope of Project

The large slide body east of the Bevatron has a static factor of safety of 1.2 which is too low for this Laboratory's seismic zone. The lower portion of this slide body is located just above the Bevatron. The static safety factor varies with the season dependent upon moisture content. When the slide debris becomes saturated, this factor sometimes drops to less than 1.0, as evidenced by inclinometer measurement of minor creep movements across the slide.

In 1976, soils engineering consultants, Harding-Lawson Associates (HLA), performed a dynamic analysis of the slide body above the Bevatron in an attempt to estimate probable downslope movement in the event of a Richter magnitude 7.0 earthquake on the nearby Hayward Fault. Although no known active faults cross the slide area, the region is seismically active and will be subject to intense ground shaking. The HLA report of April 21, 1976 indicated that the slide body would probably slip downward between 3-1/2 and 11 feet. In this event, Building 46 and the adjacent bridge ride the slide downhill in an erratic differential movement. The probable result would be the collapse of Building 46 and the movement of the bridge west and downhill towards the Bevatron posing severe threat to life safety. The incoherent mass of soil, rock, and debris loosened by the slide would move down the slope into the Bevatron Substation and Motor Generator (MG) room, threatening personnel safety and disrupting operations at the Bevatron.

The slope north of the Mechanical Shops consists of a fill slope above the upper retaining wall behind the shops. In 1969, a compact fill slope with subdrainage was installed at the northeast corner of the building above the loading dock. Measurements from slope inclinometers installed through the upper slope fill indicate that the slope is creeping southwest at a slow rate (i.e., static factor of safety less than 1.0).

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Slope and Seismic Stabilization Above the Bevatron, Building 51, and Mechanical Shops, Building 77
Lawrence Berkeley Laboratory
Berkeley, California

2. Project Number: 90-R-117

9. Purpose, Justification of Need, and Scope of Project (Continued)

In 1979, HLA reported the probable effects from earthquake shaking behind Building 77. In the event of a Richter magnitude 7.0 earthquake on the Hayward Fault new sliding will be propagated. Slope failure will occur at the base of the fill, and incoherent material will flow over the two retaining walls and fill the area between the lower retaining wall and the north wall of Building 77. This would damage the northern section of Building 77 and disrupt operations within the Mechanical Shops Building.

In addition, the use of Grizzly Gate (one of three main gates) would be lost for a period of from one to two years, posing a severe hindrance to Laboratory access. The overall loss of time and capital that would result from the failure of one or both of the unstable slopes would be substantial in comparison to the cost of the stabilization measures that are proposed. The stabilization of the two slopes will protect the Bevatron, Building 46, and the Mechanical Shops against serious damage in the event of a strong earthquake or slide triggering action and mitigate the life safety hazard at Building 46. The operations in both Buildings 46 and 77 impact virtually every program at the laboratory. Building 46 houses electronics and electrical engineering support staff and Building 77 contains the central shops for most fabrication and repair services for the entire Laboratory.

The potential cost to repair damage due to a magnitude 7.5 earthquake on the nearby Hayward Fault has been estimated for each of the two slide areas; \$10,000K for slide above the Bevatron and \$7,000K for the slide above the Mechanical Shops Building. Approximately 170 people occupy Building 46 where the potential for collapse is most significant. Altogether, Building 46, 51, 51A and 77 house about 330 employees with about 240,000 GSF of space, most of which is heavy laboratory and shop space containing very expensive scientific and support equipment.

This project will complete a long-term program at LBL which has succeeded in stabilizing other known landslide areas that could cause significant property damage in the event of a strong earthquake or static movement due to excessive soil moisture.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Slope and Seismic Stabilization Above the Bevatron, Building 51, and Mechanical Shops, Building 77 Lawrence Berkeley Laboratory Berkeley, California

2. Project Number: 90-R-117

10. Details of Cost Estimate

a. Engineering, Design and Inspection @ 20% of Construction Costs.....		\$ 500
b. Construction Costs.....		2,530
1. Improvements to Land.....	\$2,530	
2. Buildings Improvements.....	0	
3. Special Facilities (power supply).....	0	
4. Utilities.....	0	
c. Standard Equipment.....		0
d. Removal Cost Less Salvage.....		0
	Subtotal.....	3,030
e. Contingency @ about 22%.....		670
	Total Estimated Cost.....	\$ 3,700

Construction costs have been escalated at 1.9%, for FY 1987, 3.4% for FY 1988, 4.3% for FY 1989, 4.8% for FY 1990, 5.0% for FY 1991, and 2.8% for FY 1992, compounded to midpoint of construction, March 1992, for a total of 24.8%.

Conceptual design is complete.

PED requirements: none

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Slope and Seismic Stabilization Above the Bevatron, Building 51, and Mechanical Shops, Building 77
Lawrence Berkeley Laboratory
Berkeley, California
2. Project Number: 90-R-117
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11. Method of Performance

Engineering, design and inspection will be performed by LBL's Plant Engineering Department. Construction and procurement will be accomplished by fixed-price subcontracts awarded on the basis of competitive bids.

DEPARTMENT OF ENERGY
FY 1991 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS
ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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|--|--|
| 1. Title and location of project: Electrical systems upgrade
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee | 2. Project No. 90-R-113 |
| 3. Date A-E initiated: 1st Quarter FY 1990 | 5. Previous cost estimate: \$2,300
Date: December 1988 |
| 3a. Date physical construction starts: 4th Quarter FY 1990 | 6. Current cost estimate: \$2,300
Less amount for PE&D: <u>0</u>
Net cost estimate: <u>\$2,300</u>
Date: September 1988 |
| 4. Date construction end: 4th Quarter FY 1991 | |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	2,300	843	843	200
	1991	0	1,445	1,445	1,100
	1992	0	12	12	1,000

8. Brief Physical Description of Project

The project will replace aged, obsolete, and unreliable equipment and hardware in the Oak Ridge National Laboratory (ORNL) electrical system. Two existing 13.8kV overhead distribution lines will be rebuilt and one 2.4kV overhead distribution line will be recircuited from an existing 13.8/2.4 kV substation. Antiquated 480 volt switchgear and service will be installed to replace an old transformer at the main entrance and guard portal. Two obsolete and unreliable series street lighting systems will be replaced with more efficient high pressure sodium lighting. Existing overhead signal cables will be relocated underground along ORNL's Central Avenue.

First year funding will be utilized for design and related activities.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Electrical systems upgrade
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee

2. Project No. 90-R-113

9. Purpose, Justification of Need for, and Scope of Project

The purpose of the proposed project is the restoration of deteriorated distribution lines and to replace old and obsolete equipment needed to ensure a reliable source of electrical power as well as to meet the demands of the continuing research programs at ORNL. The FY 1981 Upgrade ORNL Primary Substation project upgraded ORNL's primary substation. The FY 1985 Primary Electrical Distribution System Restoration project restored sections of ORNL's electrical distribution system. This project completes the systematic rehabilitation of ORNL's electrical distribution system from the primary substation to the local substations.

Most of ORNL's electrical systems were built between the 1940s and the 1960s, making the existing systems roughly 20 to 40 years old. The systems designated for replacement and restoration in this project have already served beyond their life expectancy, and increased maintenance outages are anticipated in order to keep them in operating condition. The improved reliability of the electrical distribution system is essential to reduce the disruption of electrical services to the Laboratory users.

The street-light circuits to be restored are obsolete incandescent series lighting systems. The circuits encircle the Central Research Complex and serve the main parking lot. This area has the highest population concentration and is occupied around the clock. Currently, the deteriorated system is functional only about 50% of the time, leaving large portions of the Laboratory's streets in darkness and creating marginal safety and security situations. The new lighting system will contain efficient current-technology lights, which will reduce operating and maintenance costs by more than 75% while significantly improving the light level.

The overhead signal circuits currently along Central Avenue will be relocated to existing underground conduits. This relocation will place these critical circuits where they will be virtually invulnerable to disruption due to weather, vehicle accident, or other actions, and will permit pole lines that are currently located within a major pedestrian walkway to be eliminated.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Electrical systems upgrade
 Oak Ridge National Laboratory (ORNL)
 Oak Ridge, Tennessee

2. Project No. 90-R-113

10. Details of Cost Estimates*

	<u>Total Cost</u>
a. Engineering, design and inspection at approximately 14% of construction costs, item b.....	\$ 240
b. Construction costs (outside utilities).....	1,795
Subtotal.....	2,035
c. Contingency @ 13% of above costs.....	265
Total.....	\$ 2,300

*The cost estimate is based on a conceptual design completed in January 1986 at a cost of \$87,000 and escalated to the period of performance.

11. Method of Performance

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

DEPARTMENT OF ENERGY
 FY 1991 CONGRESSIONAL BUDGET REQUEST
 CONSTRUCTION PROJECT DATA SHEETS
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT
 MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Measurements and controls support facility 2. Project No. 90-R-112
 Oak Ridge National Laboratory (ORNL)
 Oak Ridge, Tennessee

3. Date A-E initiated: 1st Quarter FY 1990 5. Previous cost estimate: \$4,430
 Date: December 1988

3a. Date physical construction starts: 1st Quarter FY 1991 6. Current cost estimate: \$4,430
 Less amount for PE&D: 0
 4. Date construction end: 3rd Quarter FY 1992 Net cost estimate: \$4,430
 Date: September 1988

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 4,430	\$ 884	\$ 884	\$ 800
	1991	0	3,100	3,100	1,630
	1992	0	446	446	2,000

8. Brief Physical Description of Project

The proposed project will construct a two-story building providing approximately 20,000 sq. ft. in the Instruments and Controls complex area. It will contain offices, testing areas for instrumentation and automation systems, a process instrument shop, chemical laboratory support, a conference/training room and service areas for utilities, power and other building operations support systems.

The offices and testing areas will accommodate about 60 people. The testing areas will consist of room which will be used for staging and testing electro-optics, dust sensitive assemblies and devices, electro-magnetic interference/radio frequency interference (EMI/RFI) sensitive and other electronics, and computer systems. A process instrument shop will be provided for maintenance and assembly of instrument systems.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Measurements and controls support facility 2. Project No. 90-R-112
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee

8. Brief Physical Description of Project (continued)

Chemical Laboratory support will be provided with benches and normal utilities. The service areas include building temperature control and support equipment, communications terminals, restrooms, an elevator, and storage.

The testing areas for dust sensitive activities and for electro-optics activities will be constructed to minimize dust infiltration and/or accumulation in these areas. The computer systems testing areas will be provided with raised floors.

Each of the two light chemical laboratories will be provided with a hood and bench. Normal utilities will be provided to these laboratories.

Telecommunication features will include voice, data, and public address systems. Communication rooms will be provided to the first and second floors to accommodate the telecommunication system. Special wiring blocks will be provided in the rooms for the future addition of local area networks. Empty wireways will be provided in corridors for instrumentation cabling. Underground conduits will be provided for routing communications wiring into the building. Signal cable conduits will be provided from the proposed building to three adjacent buildings.

Site improvements include the construction of walkways, parking for vehicles, and restoration of all areas disturbed by the construction. A power transformer to provide building main power will be located exterior to the building.

First year funding will provide engineering design for the project and site preparation work for the proposed facility.

9. Purpose, Justification of Need for, and Scope of Project

The purpose of this project is to provide adequate space and facilities for essential support personnel and functions presently located in a deteriorated wooden building and in converted laboratories and storage rooms inadequate for current and projected needs.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Measurements and controls support facility 2. Project No. 90-R-112
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee

9. Purpose, Justification of Need for, and Scope of Project (continued)

The key factors which make the replacement of the existing wooden structure essential are:

- a. Rehabilitation of other existing space cannot be cost-effectively accomplished.
- b. Major losses in productivity due to the currently inadequate facilities.
- c. The cost-effective location for adequate long-term housing for instruments and controls Hygiene, and Environmental and Occupational Safety is the site occupied by the deteriorated wooden building activities within the current Instruments and Controls complex.

The MCSF will house personnel from instruments and controls. It will provide adequate space to accommodate the support functions and personnel now located in various inadequate existing buildings. The proposed location of the MCSF provides for a timely and efficient response.

The following alternatives for this project were considered.

Alternate 1: Relocate this portion of the Instruments and Controls function to adequate space and facilities at other Oak Ridge sites. This alternative was assessed, and an annual cost of up to \$1,500,000 due to lost work hours, transportation costs, and impact on productivity due to isolation from the Oak Ridge National Laboratory base was indicated.

Alternate 2: Modify another building to provide adequate long-term space and facilities. An assessment of other buildings in the vicinity of the proposed MCSF site, considered as candidates for the MCSF, found them to be unfit and uneconomical for the required modifications because of structure type, deteriorated state, contamination, size, and need to relocate contained facilities.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Measurements and controls support facility 2. Project No. 90-R-112
 Oak Ridge National Laboratory (ORNL)
 Oak Ridge, Tennessee

9. Purpose, Justification of Need for, and Scope of Project (continued)

Alternate 3: Indefinitely defer the provision of adequate space and facilities. An assessment of this alternative indicated an inevitable need to rehabilitate the old contaminated building. The cost of incremental rehabilitation is estimated to be in excess of \$4,000,000. An added operating cost burden due to personnel displacement and work interruptions would attend incremental rehabilitation. This cost was estimated at approximately \$3,000,000 if the incremental rehabilitation construction schedule had a duration of about three years.

These alternatives indicate that the proposed building is a cost-effective solution to meet the space and facility needs of the three critical interrelated support activities.

10. Details of Cost Estimates*

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at approximately 15% of construction costs, item b.....		\$ 500
b. Construction costs (outside utilities).....		3,040
(1) Improvements to land.....	\$ 25	
(2) Building costs, approx. 20,000 sq. ft. @ approx. \$105/sf..	2,300	
(3) Outside utilities.....	255	
(4) Special facilities.....	460	
c. Removal cost less salvage:		
(1) Demolition of existing building, acceptable disposal of scrap and spoils, and site restoration.....		240
Subtotal.....		3,780
d. Contingency @ 17% of above costs.....		650
Total.....		\$ 4,430

*The cost estimate is based on a completed conceptual design report, issued in January 1987, at a cost of \$120,000.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Measurements and controls support facility 2. Project No. 90-R-112
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee

11. Method of Performance

Design and inspection for the new building shall be performed under a negotiated architect-engineer contract. To the extent feasible, construction and procurement of the new building and demolition of the existing building shall be accomplished by fixed-price contracts and purchase orders awarded on the basis of competitive bidding.

DEPARTMENT OF ENERGY
FY 1991 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS
ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- | | |
|---|---|
| 1. Title and location of project: Original Labsite Substation
Lawrence Berkeley Laboratory (LBL)
Berkeley, California | 2. Project No.: 90-R-111 |
| 3. Date A-E work initiated: 3rd Qtr. FY 1990 | 5. Previous cost estimate: \$ 2,950
Date: December 1988 |
| 3a. Date physical construction starts: 4th Qtr. FY 1991 | 6. Current cost estimate: \$ 2,950
Less amount for PE&D: 0
Net cost estimate: \$ 2,950
Date: September 1989 |
| 4. Date construction ends: 4th Qtr. FY 1992 | |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 2,950	\$ 247	\$ 247	\$ 150
	1991	0	2,400	2,400	930
	1992	0	303	303	1,870

8. Brief Physical Description of Project

This project is the second of several elements to improve the reliability of the electrical distribution system of the entire laboratory.

This project will install a new 12kV substation south of Building 6 and provide for new 12kV distribution circuits to laboratory facilities in the Original Laboratory Site area. The existing substation at Building 6 is presently served by one 12kV supply line. Distribution of power to approximately 25 buildings is accomplished through one main circuit breaker and eight (8) fused disconnect switches. The existing substation also includes a voltage regulator which compensates for incompatible voltage taps on downstream transformers. The new substation will initially augment the existing substation and after a transition period, provide all power to the Original Laboratory Site area.

CONSTRUCTION PROJECT DATA SHEETS

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Original Labsite Substation
Lawrence Berkeley Laboratory (LBL)
Berkeley, California

2. Project No.: 90-R-111

8. Brief Physical Description (continued)

The new substation will be a double ended configuration and utilize 500 mVA, 13.8kV metalclad switchgear. The switchgear will be housed in an outdoor metal enclosure and include a protected isle. The switchgear will be located on a concrete slab of about 1,000 sq. ft. From the substation, 12kV power circuits will radially branch out and distribute electrical energy to building and laboratory substations. These circuits will utilize 250 MCM and 500 MCM power cables which will be installed in new and existing underground ducts.

The new government-owned facilities will be located on land owned by the University of California and will serve Government-owned facilities at the Lawrence Berkeley Laboratory.

9. Purpose, Justification of Need, and Scope of Project

The existing electrical distribution system in the Original Laboratory Site is 40 years old. One-third of all Laboratory facilities is served by this system. Deterioration of 12kV distribution cables and switching equipment has resulted in power outages and interruption of programmatic activities. Most of the equipment has reached the end of its useful life and is therefore subject to increased maintenance needs. The lack of appropriate ground fault protection on individual circuits prevents confinement of power failures to the affected area, thus resulting in widely distributed outages. Current and future programmatic activities require reliable and economic power. In particular, the medical treatment facility will be severely impaired by increasing power failures. Furthermore, new laboratory facilities such as the Advanced Materials Laboratory (AML), require new power feeders which can only be accommodated at the new substation.

In summary, the existing substation and distribution system no longer meet the laboratory's operating requirements for the following reasons:

1. Existing substation equipment and 12kV cable system are aged and subject to power failure.
2. Existing system does not permit localization of power failures. Outages, unnecessarily affect numerous facilities and programmatic activities.
3. Existing equipment cannot be expanded to segregate existing circuits and to accommodate new distribution circuits for new laboratory developments such as the AML.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Original Labsite Substation Lawrence Berkeley Laboratory (LBL) Berkeley, California	2. Project No.: 90-R-111
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10. <u>Details of Cost Estimate</u> *	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ approx 15% of b.....		\$ 400
b. Construction.....		2,150
(1) Utilities.....	935	
(2) Special facilities.....	1,155	
(3) Project Management.....	60	
Subtotal.....		2,550
e. Contingency @ approx. 16%.....		400
Total estimated cost.....		\$2,950

* Construction costs have been escalated at 1986 - 1.3%; 1987 - 1.9%; for 1988 - 3.9% for 1989 - 4.2%; for 1990 - 5.0%, for 1991 - 0.9%, compounded to midpoint of construction, November 1991, for a total of 24.1%. Conceptual design is complete.

11. Method of Performance

Engineering design will be performed under a negotiated Architect/Engineer subcontract. Inspection and some engineering will be done by LBL personnel. Construction and procurement will be accomplished by fixed price subcontracts awarded on the basis of competitive bids.

DEPARTMENT OF ENERGY
FY 1991 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS
ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Instrumentation Support Laboratory
 Rehabilitation - Building 70A
 Lawrence Berkeley Laboratory (LBL)
 Berkeley, California

2. Project No.: 90-R-110

3. Date A-E work initiated: 2nd Qtr. FY 1990

3a. Date physical construction starts: 3rd Qtr. FY 1991

4. Date construction ends: 3rd Qtr. FY 1992

5. Previous cost estimate: \$ 2,000
 Date: December 1988

6. Current cost estimate: \$ 2,000
 Less amount for PE&D: 0
 Net cost estimate: \$ 2,000
 Date: September 1988

<u>7. Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 2,000	\$ 197	\$ 197	\$ 110
	1991	0	1,800	1,800	990
	1992	0	3	3	900

8. Brief Physical Description of Project

This project will rehabilitate 4,700 sq. ft. office and laboratory space on the third floor, Building 70A, Nuclear Sciences, Materials and Molecular Research, and Earth Sciences to provide improved and upgrade clean-room facilities.

These improvements to existing government-owned facilities are located on leased land owned by the Regents of the University of California.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Instrumentation Support Laboratory 2. Project No.: 90-R-110
 Rehabilitation - Building 70A
 Lawrence Berkeley Laboratory (LBL)
 Berkeley, California

9. Purpose, Justification of Need, and Scope of Project

This project will rehabilitate the facilities that provide instrumentation support for nuclear science, high-energy physics, and health and environmental research. The obsolescence of existing instrumentation support facilities severely limits this support. This obsolescence will certainly worsen due to the higher level of sophistication which will be required of high technology instrumentation in the future.

The main purpose of the facility is for the fabrication and development of semi-conductor detectors and associated cryostats and electronics. This includes assembly and testing of highly sophisticated vacuum/cryogenic systems. The present facility lacks the basic cleanliness required for these operations.

This laboratory rehabilitation will permit significant improvement in the performance and yield of devices and systems used in a broad range of DOE programs.

10. Details of Cost Estimate *

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ approx 19% of b.....		\$ 260
b. Construction.....		1,390
(1) Buildings.....	1,125	
(2) Special Facilities.....	225	
(3) Project Management.....	40	
c. Standard equipment.....		10
d. Demolition and removals.....		60
Subtotal.....		<u>1,720</u>
e. Contingency @ approx. 16%.....		280
Total estimated cost.....		<u>\$2,000</u>

* Construction costs have been escalated at 1986 - 1.3%; 1987 - 1.9%; for 1988 - 3.9% for 1989 - 4.2%; for 1990 - 4.8%, for 1991 - 5.0%, compounded to midpoint of construction, October 1991, for a total of 23.0%. Conceptual design for is complete.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Instrumentation Support Laboratory
Rehabilitation - Building 70A
Lawrence Berkeley Laboratory (LBL)
Berkeley, California
2. Project No.: 90-R-110
-

11. Method of Performance

Design will be accomplished by UC-LBL Plant architect-engineers, with some support and assistance by private consultants. Construction and procurement will be accomplished by fixed price contract awarded on the basis of competitive bidding. Some minor preparation and construction may be performed by LBL forces.

DEPARTMENT OF ENERGY
 FY 1991 CONGRESSIONAL BUDGET REQUEST
 CONSTRUCTION PROJECT DATA SHEETS
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND-CAPITAL EQUIPMENT
 MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Central shops alteration and addition
 Brookhaven National Laboratory (BNL)
 Upton, New York

2. Project No. 90-R-108

3. Date A-E initiated: 1st Quarter FY 1990

3a. Date physical construction starts: 1st Quarter FY 1991

4. Date construction end: 3rd Quarter FY 1991

5. Previous cost estimate: \$1,680
 Date: December 1988

6. Current cost estimate: \$1,680
 Less amount for PE&D: 0
 Net cost estimate: \$1,680
 Date: September 1988

<u>7. Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 1,680	\$ 306	\$ 306	\$ 300
	1991	0	1,370	1,370	1,376
	1992	0	4	4	4

8. Brief Physical Description of Project

This proposal provides for the construction of a new building having a gross area of about 11,400 s.f. and an approximate volume of 185,000 cubic feet. About 10,430 s.f. will be functional space or a net to gross area of 92%. The building will allow the relocation of all the Laboratory's welding shop. Those functions are presently housed in low bay inefficient 40 year-old World War II structures.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Central shops alteration and addition
 Brookhaven National Laboratory
 Upton, New York

2. Project No. 90-R-108

8. Brief Physical Description of Project (continued)

This proposal provides for the construction of a new addition to the existing "Heavy Machine Shop" (Building No. 479). The addition will be the first phase of the consolidation of all research machining facilities. The addition will permit the demolition or excessing of the existing welding shop (Building No. 208).

Construction will be of the non-combustible type. In general, the building will be a steel frame with concrete floors. All walls and roofs will meet or surpass energy conservation standards and glazed areas kept to a minimum. All overhead doors will be insulated and power operated. The buildings design also will be inherently energy conserving via its mass to exposed exterior surface ratio and in accordance with Chapter 10, Part 101-20, 1/6-3 of the Federal Property Management Regulations. Finished areas will be resilient tile flooring and/or hardened concrete floors.

Electrical power of required voltage and current capacities will be incorporated in accordance with the various programs. Lighting levels and equipment will be designed to meet the latest energy conservation requirements and to assure low maintenance costs.

A tabulation and description of spaces and related areas for the proposed building follows:

<u>Space</u>	<u>Area</u> (s.f.)
Degreasing	660
Sandblasting	720
Quality control	1,200
X-ray	510
Planning	2,380
Turret lathes and grinding	2,108
Welding	2,852
Total functional areas	10,430
Non-functional areas	970
TOTAL	11,400

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Central shops alteration and addition
Brookhaven National Laboratory (BNL)
Upton, New York
2. Project No. 90-R-108

9. Purpose, Justification of Need for, and Scope of Project

This project is part of an overall facilities upgrading plan called for in the Laboratory's Site Development Plan. An addition will be made to the Heavy Machine Shop, Building 479, with an area of some 11,400 square feet contiguous to the existing high bay area. It will consist of all high bay area and will contain two bridge cranes, one with a ten ton capacity and one with a twenty ton capacity. The additional space will be used to contain machining and welding of large fabrications. Some of the equipment now located under a three ton crane in the Heavy Machine Shop original building will be moved to this area as will several welders along with their associated welding equipment. Sand blasting operations and equipment, inspection area, and x-ray facility which is now housed in building 208 will also be relocated to this new facility.

The Central Shops Division currently has its operations contained in various buildings as follows:

<u>Building No.</u>	<u>Function</u>	<u>Gross Area</u>	<u>Constructed</u>
206	Metals cutting	5,200	1942
207	Sheet metal	8,000	1942
208	Welding	9,300	1943
462	Light machine shop	20,300	1945
	Radioactive machine shop		
462A	Storage	500	1980
473	Electron beam welding		
	Machine maintenance	4,300	1942
479	Heavy machine shop	22,900	1946
1006	Long Bed Machining (Temp. Use)	2,500	1981
1008	Uranium stamping (Temp. Use)	2,500	1981
Various	Large weldment work	*	
Outdoors	Large weldment work	**	

* as space is free

** when space is available

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Central shops alteration and addition
Brookhaven National Laboratory (BNL)
Upton, New York

2. Project No. 90-R-108

9. Purpose, Justification of Need for, and Scope of Project (continued)

Building Nos. 206, 207, and 208 are former Army quartermaster warehouses constructed in the early 1940's. Building 462 and 479 are wall bearing masonry Army gymnasiums constructed about 1944. The latter have concrete floors with steel and wood frame roof systems and are intended to be saved and modified. Furthermore, Building No. 462 is planned to be converted for structural biology research and the latter (No. 479) will be expanded to become the core of the Central Shops Division.

Building No. 462A is prefabricated steel building installed on a concrete slab. Building No. 473 is a high bay masonry building constructed during World War II as the central boiler plant for most of the Army's Camp Upton. This building is eventually planned to be demolished. Building No. 1006 and 1008 were completed in 1982 as part of the proposed colliding accelerator complex and will become a vital part of the proposed Relativistic Heavy Ion Collider (RHIC) project.

This proposed project is considered a vital part of the Laboratory's revitalization and was identified on the basis of the following criteria:

- a. It is consistent with revitalization goals, including environmental, safety, and health requirements.
- b. It addresses current deficiencies.
- c. It corrects a portion of certain deficiencies and is within Agency funding limitations.
- d. It has sound economic justification and starts the process of consolidating various functions now scattered around the site.

Brookhaven National Laboratory's goal is to consolidate and modernize all programmatic shop facilities so that they are safe and efficient, and that these facilities will provide the largest research dollars worth of product for the amount expended to manufacture experimental equipment.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Central shops alteration and addition Brookhaven National Laboratory Upton, New York	2. Project No. 90-R-108
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9. Purpose, Justification of Need for, and Scope of Project (continued)

A survey of projected costs for the Central Shops Division operations was conducted for FY 1985. The following are the typical direct costs which will be averted when this construction project is put into operation. All costs are FY 1985 dollars.

$$\begin{aligned}
 & \$334.975 \times 1/15 = \$385.221 \text{ in FY 1988 dollars} \\
 & \text{Payback on investment} = \frac{1,600,000}{385,221} = 4.15 \text{ years}
 \end{aligned}$$

In addition, it should be noted that, due to the cramped aisle space and insufficient crane capacity and working height, there is a certain amount of risk involved when large weldments are fabricated in the current facility. Everything is done to minimize this risk, but it is, and will continue to be, present when we are asked to perform this type of fabrication.

10. Details of Cost Estimate*

	<u>Item Costs</u>	<u>Total Cost</u>
a. Architect-Engineer, design and inspection at approximately 10% of construction costs, Item b.....		\$ 139
b. Construction costs.....		1,389
(1) Improvements to land.....	\$ 46	
(2) New addition (11,400 sq. ft. @ \$84.21).....	1,008	
(3) Demolition.....	10	
(4) Special equipment, 2 cranes (1 @ 10T, 1 @ 20T).....	325	
Subtotal.....		1,528
c. Contingency @ approximately 10% of above costs.....		152
Total.....		\$ 1,680

*The estimate is based on a conceptual design which is 100% complete. Escalation rates are in conformance to the guidelines prescribed by the Department of Energy, August 1986. They are based on the material and labor data contained in the Energy Supply Planning Model and escalation rates forecasted by Data Resources, Inc. (DRI). Escalation rates for FYs 1987, 1988, 1989 and first quarter 1990, are respectively 3.1%, 4.2%, and 4.9% and 1.3%.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Central shops alteration and addition
Brookhaven National Laboratory
Upton, New York

2. Project No. 90-R-108

11. Method of Performance

Building design will be on the basis of negotiated architect-engineer contract. Construction and procurement will be accomplished by a fixed contract and purchase orders awarded on the basis of competitive bidding.

DEPARTMENT OF ENERGY
 FY 1991 CONGRESSIONAL BUDGET REQUEST
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 ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT
 MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Boiler replacement Brookhaven National Laboratory (BNL) Upton, New York	2. Project No. 90-R-107
3. Date A-E initiated: 2nd Quarter FY 1990	5. Previous cost estimate: \$3,520 Date: December 1988
3a. Date physical construction starts: 2nd Quarter FY 1991	6. Current cost estimate: \$3,520 Less amount for PE&D: 0 Net cost estimate: \$3,520 Date: September 1988
4. Date construction end: 2nd Quarter FY 1992	

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 3,520	\$ 319	\$ 319	\$ 200
	1991	0	3,196	3,196	770
	1992	0	5	5	2,550

8. Brief Physical Description of Project

This project provides for the installation of a new boiler, of about 125,000 lbs. per hour, at the Central Steam Facility. The new unit will be equipped with an economizer, soot blowers, forced-draft fan with electric and steam turbine drives, feed water regulator. The proposed boiler will have high efficiency burners capable of firing 100% light feedstock (alcohols, mineral spirits, solvents, etc.) blends of No. 6 fuel oil and light feedstocks through 100% heavy residual fuel oil. In addition, the boiler will be equipped with low excess air firing combustion controls - safety devices and alarms, corten stack, etc. The boiler will be connected to associated support systems, both new and modified, consisting of: combustion air, fuel oil, burner management system, deaeration, steam, electrical, compressed air, drainage, etc. A new feedwater and chemical treatment system will be required for the boiler.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Boiler replacement
Brookhaven National Laboratory (BNL)
Upton, New York

2. Project No. 90-R-107

8. Brief Physical Description of Project (continued)

Also included are the required building modifications, to the Central Steam Facility, for accommodating the new boiler configuration and auxiliary equipment arrangement. These building alterations relate essentially to reinforcing the structural steel members, raising a section of the roof line and the removal and replacement of building sidewall to facilitate rigging in the new boiler.

9. Purpose, Justification of Need for, and Scope of Project

The purpose and justification for the installation of a replacement boiler in BNL's Central Steam Facility is as follows:

- BNL currently has zero reserve steam capacity to insure continuity of programmatic operations. By 1990, there will be a shortfall of over 20,000 pounds per hour of required capacity.
- The boiler replacement is required to assure adequate firm capacity to meet the Laboratory's 1991 steam demands.
- The BNL boilers are approaching the end of their economic life. The standard service life for a boiler is 25 years according to "Accounting Practices and Procedures Handbook" published by the DOE Office of the Controller. Boilers 1A and 4 have had multiple tube failures causing extended unscheduled outages. Boiler ages as of 1991 are:
 - Boiler 1A - 28 years
 - Boiler 4 - 30 years
 - Boiler 5 - 26 years
- The proposed boiler is a replacement for aging (1963), unreliable, inefficient and undersized Boiler 1A.
- The proposed boiler will have more efficient heat transfer, burners and controls. It is expected to be about 10% more efficient than the existing Boiler 1A.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Boiler replacement Brookhaven National Laboratory (BNL) Upton, New York	2. Project No. 90-R-107
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10. Details of Cost Estimate*

	<u>Item Cost</u>	<u>Total Cost</u>
a. Architect-Engineer, design and inspection at approximately 14% of installation costs, item b.....		\$ 376
b. Installation costs.....		2,685
Boiler.....	\$2,015	
Boiler accessories.....	64	
Boiler plant modifications.....	147	
Mechanical work.....	355	
Electrical work.....	104	
Subtotal.....		3,061
c. Contingency @ 15% of above costs.....		459
Total.....		\$ 3,520

*The estimate is based on a conceptual design report which was completed in March 1985 and updated in December 1986 and March 1987. The estimates are based on costs for labor, equipment, and materials for various types of construction work at Brookhaven National Laboratory. Current costs have been escalated in accordance with the DOE's August 1986 DRI Index for Construction Projects. Escalation rates for FY 1987, FY 1988, FY 1989, and FY 1990 through the midpoint of construction are respectively 3.1%, 4.2%, 4.9%, and 5.2%.

11. Method of Performance

Design, engineering, major procurement, construction, inspection and program administration will be accomplished by the operating contractor (BNL) by contracting with local Architectural/Engineering firms. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and purchase orders awarded on the basis of competitive bidding.

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FY 1991 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS
ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT
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MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Transportation Facility Replacement Argonne National Laboratory (ANL) Argonne, Illinois	2. Project No.: 90-R-100
3. Date A-E work initiated: 1st Qtr. FY 1990	5. Previous cost estimate: \$ 4,100 Date: December 1988
3a. Date physical construction starts: 3rd Qtr. FY 1990	6. Current cost estimate: \$ 4,100 Less amount for PE&D: 0 Net cost estimate: \$ 4,100 Date: September 1988
4. Date construction ends: 1st Qtr. FY 1992	

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 4,100	\$ 345	\$ 345	\$ 150
	1991	0	1,400	1,400	1,470
	1992	0	2,355	2,355	2,480

8. Brief Physical Description of Project

This project will provide a new building to house the activities of the Transportation and Grounds Service groups at the Argonne National Laboratory (ANL) Illinois site. The facility will centralize the Vehicle Maintenance and Repair, Driving and Rigging, and Grounds Maintenance activities into one facility. The building will provide offices for administrative personnel, vehicle service areas and equipment, parts and tool storage, fuel storage and dispensing facilities, vehicle washing facility. Lunch room, locker room and toilet facilities will also be provided for the employees of the service groups. Site work and related utilities, including steam, sewers, water, gas, electric power, telephone, access drives, parking areas and landscaping, will also be provided.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Transportation Facility Replacement
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 90-R-100

8. Brief Physical Description of Project (continued)

The approximately 30,000 gross sq. ft. building will be a single story varying height (12 to 27 ft) preengineered ridged frame metal building. The exterior will consist of metal curtain-wall-panels with a small amount of face-brick insulated cavity walls at the administration area. Roofing will be standing-seam aluminum-coated panels. Interior materials generally consist of concrete block and exposed metal walls with concrete on grade floors. The 5,500 sq. ft. employee service and administrative area will have a vinyl floor and acoustical tile ceiling. The design of this facility will include provisions for energy conservation. The nine temporary substandard facilities now occupied by the service group will be demolished after completion of the new building. The cost of demolishing the vacated structures is included in the total project cost.

9. Purpose, Justification of Need, and Scope of Project

The purpose of the project is to relocate and consolidate the ANL Illinois Site's Transportation and Grounds Maintenance Department operations to correct existing facility deficiencies and provide an efficient centralized operational base. The Transportation and Grounds Maintenance Department consists of three distinct but management related service groups, those being (1) the Vehicle Maintenance service group, (2) the Drivers and Riggers service group, and (3) the Grounds Maintenance service group. The functions and operations of the groups are as follows:

- a. Vehicle Maintenance Service Group - Argonne controls, services, and operates a fleet of 325 plus vehicles and pieces of mobile equipment. The service group inspects and maintains Argonne's motor vehicle fleet, mobile equipment, and materials handling equipment. The vehicles include security sedans, maintenance and delivery pickups and panel trucks, material delivery trucks, tractors, trailers, ambulances, buses, fire engines, mobile trailers, skid mounted equipment and others. For safety and reliability, the mobile equipment is given regularly scheduled inspections and maintenance and any operating problems are promptly corrected. Services include preventive maintenance, safety inspections, emergency repairs, engine tuneups, cooling systems, exhaust systems, adjustment to clutches, brakes, minor transmissions, front end, brake linings, wheel balancing, wheel bearings, shock absorbers, universal joints, electrical, tires, lubrication and small body and trim work.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Transportation Facility Replacement
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 90-R-100

9. Purpose, Justification of Need, and Scope of Project (continued)

- b. Driver/Rigger Service Group - The driver part of the group consists of personnel who drive taxis, trucks, and buses, and are also assigned to a variety of other duties. A dispatcher coordinates regularly assigned work, unscheduled requests, and vehicle fuel. The riggers provide moving, lifting, hoisting of heavy loads, and specialized services such as those needed for installation of scientific laboratory equipment. The rigging services also move equipment and materials in or between buildings where lifting and transporting devices are needed.
- c. Grounds Maintenance Service Group - This service group provides maintenance for all the grounds, roads, storm sewers, signs and walkways through the Argonne, Illinois site, and the maintenance of grounds equipment such as fork lifts, cranes, backhoes, Cushman haulsters, asphalt rollers, road graders, and other grounds equipment.

At the present, vehicle maintenance service, grounds service, and rigging activities are scattered throughout eight buildings and one trailer. The buildings currently being used for these service activities are Quonset buildings constructed to serve as temporary quarters during construction of Argonne in 1948. The Quonset buildings have been converted at various times to include a number of uses, most recently to serve as garages, shops, and offices for the transportation and maintenance service groups. This dispersal of work locations has led to and/or encouraged, inefficiencies in operations. There is, therefore, a demonstrated need to consolidate the Transportation and Grounds Maintenance service operations into one facility strategically located that can provide for a safer, most efficient, cost saving operation.

- a. Current Deficiencies: The design life span of the Quonset buildings was seven years. Having exceeded their expected life span by a factor of five, they are in an advanced stage of deterioration and exhibit structural deterioration, corrosion, and roof leaks. Rehabilitation of these buildings is not cost effective. The current deficiencies include:

Utility Systems are inadequate and underdesigned to meet current needs. Also, a separate industrial waste system is needed to control all wastes generated within the facility that must be processed before discharge into a sanitary sewer system.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Transportation Facility Replacement
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 90-R-100

9. Purpose, Justification of Need, and Scope of Project (continued)

The Energy Cost of operating these substandard buildings grossly exceed today's standards for energy conservation. Preventive rehabilitation work will not significantly reduce this cost and the poor environmental conditions can only increase as the structures continue to function operationally beyond their useful life. Further, these buildings are heated independent of the Laboratory's central heating plant and use a more costly fuel oil heat.

Mechanical Ventilation is inadequate in all work areas. This is particularly important in vehicle maintenance service bays where high concentrations of carbon monoxide gas from tail pipe emissions is a threat to life safety regardless of an emissions exhaust system.

Architectural: The poorly sealed building envelope makes the facilities extremely difficult to heat and/or cool. Window and door frames as incorporated in the Quonset building are separate structural elements and currently are in a state of advanced deterioration permitting high heat loss. Accordingly, a comfortable working environment cannot be provided. Additionally, the lunch rooms, lockers and restrooms are in poor condition and inadequate in size.

- b. Operational Deficiencies: Restrictions imposed on operations by the geometric configuration of the existing buildings do not allow efficient or cost-effective space utilization. The Transportation and Grounds Maintenance services overutilize the space they now occupy. The spaces are also functionally unrelated and cannot be efficiently organized.
- c. Site Location Deficiencies: Increased space demands in the past were often resolved on an "as found/where found" basis which resulted in the current scattered site locations. Some of the major deficiencies resulting from this "scattered" growth are:

Scattered working locations reduce beneficial personnel contact and dialogue with service managers and department supervisors. The result is underutilization of human resources and available equipment.

Duplication of facilities for personnel services (such as locker rooms, restrooms, and lunch rooms) increase the internal operating and maintenance costs. Additionally, these spaces do not provide adequate access for the handicapped.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Transportation Facility Replacement
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 90-R-100

9. Purpose, Justification of Need, and Scope of Project (continued)

Restricted size and configuration of the work areas severely constrain improvement in work methods and practices.

Severe crowding of vehicles in available maintenance service bay space restrict operational efficiency.

Logistical separation by distance of facilities from the user's equipment, services, and fuel dispensing station result in both time loss and operation inefficiencies.

Remote storage of frequently used materials create a retrieval time loss and permit poor administrative control.

Remote storage of low value materials: Of the three mobile home-type trailers purchased by Argonne in 1967 as Federal Government surplus units, only one remains in use today. This aged and deteriorated trailer does not meet current Argonne health and safety requirements of personnel occupied space. Its high flame-spread characteristics renders it hazardous except for the storage of low value materials.

Inadequate access to work areas result in frequent work interruptions when stored equipment must be moved to gain access to other equipment or when various-sized mobile vehicles must be juggled into position for servicing.

Site access, driveways, and parking lots at the existing facilities have not been maintained pending long-range site development plans which preclude continued use of this area for support service functions. Current conditions are damaged beyond reasonable repair and are considered generally unsafe.

d. Environmental Deficiencies: Physical deterioration and deficient environmental conditions have created substandard facilities which demonstrably reduce productivity and staff morale.

e. Equipment Related Deficiencies:

Vehicle lifting and hoisting capabilities are inadequate and require time-consuming alternative procedures for under-body servicing of large vehicles and/or heavy equipment.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Transportation Facility Replacement Argonne National Laboratory (ANL) Argonne, Illinois	2. Project No.: 90-R-100
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9. Purpose, Justification of Need, and Scope of Project (continued)

Inadequate cleaning and degreasing facilities impair procedures for preventive maintenance and inspections.

Vehicle washing facilities are currently not available at Argonne. Frequent exterior washings of vehicles is known to be cost effective and would increase vehicle-body life. All of the previously described deficiencies can be diminished or eliminated by the construction of a new facility strategically located to accommodate this support service. The new facility will be cost effective in terms of labor productivity improvement and equipment operating life, better inventory control and less damage to materials and equipment stored in inadequate facilities. Additionally, several intangible improvements will also be realized which are not quantifiable, such as life-safety, employee morale, and overall organizational response to the laboratory's research and development needs.

10. Details of Cost Estimate *

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ 12% of construction costs, item b.....		\$ 365
b. Construction.....		3,200
(1) Site Work.....	\$ 579	
(2) Building (30,000 sq. ft. at approx. \$70/sq. ft.).....	2,228	
(3) Utilities.....	393	
Subtotal.....		<u>3,565</u>
c. Contingency @ 15% of above costs.....		535
Total estimated project cost.....		<u>\$4,100</u>

* Based upon a completed conceptual design and current cost data. Cost escalation rate for 1987 - 2.5%; for 1988 - 4.0% for 1989 - 4.8%; for 1990 - 5.3%; and for 1991 - 5.6%.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Transportation Facility Replacement
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 90-R-100

11. Method of Performance

Preliminary design and engineering for the total project will be performed by laboratory personnel. The building shell will be accomplished under a fixed-price design-build contract. Final design and engineering of the building interior finishes, mechanical, and electrical systems will be performed under a negotiated architect-engineer contract. All construction and procurement will be accomplished by fixed-price contracts awarded on the basis of competitive bidding. Laboratory personnel, with assistance from a construction management firm, will perform project management activities and inspection.

DEPARTMENT OF ENERGY
 FY 1991 CONGRESSIONAL BUDGET REQUEST
 CONSTRUCTION PROJECT DATA SHEETS
 ENERGY SUPPLY RESEARCH AND-DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT
 MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- | | |
|---|--|
| 1. Title and location of project: Electrical system rehabilitation, phase I
Argonne National Laboratory (ANL)
Argonne, Illinois | 2. Project No.: 88-R-807 |
| 3. Date A-E work initiated: 1st Qtr. FY 1988 | 5. Previous cost estimate: None
Date: None |
| 3a. Date physical construction starts: 3rd Qtr. FY 1989 | 6. Current cost estimate: \$ 5,060
Less amount for PE&D: 0
Net cost estimate: \$ 5,060
Date: September 1988 |
| 4. Date construction ends: 4th Qtr. FY 1991 | |

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1988	\$5,060	\$ 350	\$ 350	\$ 47
	1989	0	1,150	1,150	345
	1990	0	2,662	2,662	2,990
	1991	0	860	860	800
	1992	0	38	38	878

8. Brief Physical Description of Project

The project provides for the rehabilitation of the main electrical distribution system's major components. The work consists of the following critical elements:

- a. Replace the two 10MVA, 132kV/12.5kV, main transformers at Facility 543 and provide oil containment facilities in accordance with current Federal/State Environmental Protection Agency (EPA) regulations. This work consists of the following:
 - (1) Replace two over-aged 10 MVA, 132 kV/12.5kV oil-filled transformers with new units.
 - (2) Provide oil containment facilities to comply with the current Federal EPA regulations.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Electrical system rehabilitation, phase I
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 88-R-807

8. Brief Physical Description of Project (continued)

- (3) Replace two over-aged 15kV oil circuit-breakers with new vacuum circuit-breakers.
 - (4) Replace inadequate metering and protective relaying equipment with new equipment.
 - (5) Replace the air "tie" switch with a new vacuum circuit-breaker with needed automatic transfer capabilities.
 - (6) Provide, as a part of the new metering equipment, provisions for ultimate future expansion into the energy monitoring and control system.
 - (7) Repair and paint the overhead structure.
- b. Replace deteriorating poles, cross-arms insulators, down-guys, and miscellaneous hardware on the two main two 15kV overhead lines between Facility 543 and Facility 544.
- c. Replace the two 1MVA voltage regulators at Facility 544. This work consists of the following:
- (1) Replace nine obsolete 15kV air switches on the overhead structure with new units.
 - (2) Replace the "government surplus" 1.0MVA, 12kV voltage regulators with new units sized to accommodate the forced-air ratings of the two 10MVA transformers at Facility 543 which feed these regulators.
 - (3) Replace the 15 aging oil-filled outdoor 15kV circuit-breakers with new vacuum circuit-breakers in a walk-in structure.
 - (4) Replace the protective relaying equipment with the state-of-the-art solid-state relaying equipment.
 - (5) Provide individual feeder metering facilities.
 - (6) Replace the inadequate meter house with space in the walk-in switchgear.
 - (7) Replace the aged battery and battery charging equipment with new state-of-the-art equipment.
- d. Replace two 1MVA, 12.5kV transformers at Facility 545 and provide oil containment facilities in accordance with current Federal/State EPA regulations. This work consists of the following:
- (1) Replace two 1MVA rebuilt "World War II government surplus" transformers with new oil-filled equipment.
 - (2) Provide oil containment facilities to meet Federal EPA requirements.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Electrical system rehabilitation, phase I
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 88-R-807

8. Brief Physical Description of Project (continued)

- (3) Provide switchgear to protect the two new transformers and the recently relocated unit substation (for the scrubber facilities).
- (4) Provide required 480 volt protective vacuum circuit-breaker for the two new transformers.
- (5) Provide protective relaying equipment to protect and to coordinate the equipment with the entire distribution system.

9. Purpose, Justification of Need for, and Scope of Project

- a. The present transformers and regulators were "World War II government surplus" when they were installed thirty five years ago. They are now well over 40 years of age, which is beyond the predicted life expectancy of this type of equipment. The two old transformers in Facility 545 were "rebuilt" in 1978 after a failure in service. While this equipment is now operational, the risk of an unscheduled shutdown of the Laboratory facilities is high and is increasing. By 1988 the site's scientific programs will be in jeopardy if critical replacements are not made.
- b. There are no acceptable oil containment facilities at these locations. A major fault or leak in these oil-filled units could cause extensive and expensive cleanup problems, as well as the possibility of polluting the adjacent waterway systems.
- c. At the present there are very limited means of adequately measuring the electrical load or demand on these major pieces of equipment or main feeders. This information is critical to permit the Laboratory to intelligently monitor and analyze the site distribution system and to set overload devices on these feeders.
- d. The local utility company, as well as other large users of this type of equipment (transformers, regulators, switchgear, etc.) in general, write off the value of this equipment over thirty years. Thereafter, the components become candidates for replacement. The above described laboratory equipment is in a comparable category.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Electrical system rehabilitation, phase I 2. Project No.: 88-R-807
 Argonne National Laboratory (ANL)
 Argonne, Illinois

9. Purpose, Justification of Need for, and Scope of Project (continued)

- e. Certain parts, particularly air switches, are unreliable in their operation and replacement parts are impossible to obtain, as the manufacturer has long ago gone out of business. When replacement parts have been needed, they have been fabricated, which is extremely costly, and their reliability is questionable.
- f. The proposed rehabilitation of this critical equipment will assure continued reliability of the system to supply electrical power to the laboratory scientific programs.
- g. Other expected benefits are:
 - (1) Eliminate the costly emergency repairs and ultimate replacement of components on a "crash" basis in the event of the failure of a major component of the system.
 - (2) Reduction of the energy losses in these transformers will result in energy savings.

10. Details of Cost Estimate*

	Item Cost
a. Engineering design and inspection @ 15% of construction costs, item b	\$ 590
b. Construction.....	3,930
c. Contingency @ 12% of above costs.....	540
Total estimated cost.....	\$5,060

*Based upon a completed conceptual design and current cost data.

11. Method of Performance

The engineering work will be performed under a lump sum contract with a consultant with specific expertise in electrical distribution systems. The construction work will be a fixed price contract awarded on the basis of competitive bidding. Major equipment components will be purchased by the laboratory to expedite delivery of long lead time items. The current anticipated lead time for the transformers, regulators, and switchgear is 10 to 16 months. Advance procurement of these items will be instituted early in the project.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Electrical system rehabilitation, phase I 2. Project No.: 88-R-807
Argonne National Laboratory (ANL)
Argonne, Illinois

11. Method of Performance (continued)

All PCB (polychlorinated biphenol) contaminated equipment will be handled and disposed of according to EPA requirements. The project estimate includes the cost of PCB handling and disposal.

Laboratory personnel will perform field inspection. In order to not compromise the integrity of the system, phased replacement of equipment will be planned and scheduled to cause no interruption of electric service to the site.

DEPARTMENT OF ENERGY
 FY 1991 CONGRESSIONAL BUDGET REQUEST
 CONSTRUCTION PROJECT DATA SHEETS
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT
 MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES AND CORRECTIVE ACTIONS
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- | | |
|---|--|
| 1. Title and location of project: Environmental health & safety project
Lawrence Berkeley Laboratory (LBL)
Berkeley, California | 2. Project No.: 88-R-806 |
| 3. Date A-E work initiated: 2nd Qtr. FY 1988

3a. Date physical construction starts: 4th Qtr. FY 1988 | 5. Previous cost estimate: \$10,325
Date: September 1987 |
| 4. Date construction ends: 4th Qtr. FY 1991 | 6. Current cost estimate: \$ 9,250 a/
Less amount for PE&D: 0
Net cost estimate: \$ 9,250
Date: December 1989 |

7. <u>Financial Schedule:</u>	<u>Fiscal year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1988	\$10,325	\$ 850	\$ 850	\$ 59
	1989	0	2,516 ^{b/}	3,516 ^{b/}	580
	1990	0	4,310	4,310	1,998
	1991	0	1,512	1,512	3,844
	1992	0	62	62	2,769

8. Brief Physical Description of Project

a. Air Sampling/Monitoring

Provide improved interior and exterior constant volume sampling devices for radiation monitoring. Upgrade equipment for on-site radiation and off-site environmental monitoring.

^{a/} Remaining balance of \$1,075,000 transferred to new Office of Environmental Management.
^{b/} \$23,000 reprogrammed from prior year closed out projects.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Environmental health & safety project
Lawrence Berkeley Laboratory (LBL)
Berkeley, California

2. Project No.: 88-R-806

8. Brief Physical Description of Project (continued)

b. Building 26 Addition

A proposed Medical Services Building addition will be a second story, 2800 gross square foot addition to Building 26. This addition will be a matching steel frame structure on spread footings with metal decking and reinforced concrete floor, metal roof decking and built-up roofing, metal exterior siding, gypsum wallboard partitions, insulation, suspended ceilings, and resilient floor covering. Power, lighting, ventilation, heat, and all utilities will be included. Present medical functions will be expanded with two additional examination rooms, one office, one small medical conference room, and an equipment storage room.

c. Building 77 Waste Treatment Unit Replacement

A proposed treatment facility will treat effluent from the plating shop, remove heavy metals, and discharge treated wastes into the sanitary sewer. It will include a small building to house the new unit.

d. Monitor Underground Fuel Tanks

Drill three monitoring wells at each of eight existing tank locations and install monitoring devices.

e. Ventilation Improvements

Rehabilitate building ventilation systems by rebuilding and replacing defective and deteriorated air supply systems, controls, and fume hood exhaust systems.

f. Water Supply Cross-Connection

Rehabilitate potable water systems with backflow preventers, including industrial water, closed systems, and fire sprinkler risers.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Environmental health & safety project
Lawrence Berkeley Laboratory (LBL)
Berkeley, California

2. Project No.: 88-R-806

8. Brief Physical Description of Project (continued)

g. Emergency Shower Water Supply Conversion

Connect emergency shower water supply systems to the domestic water system.

h. Area Lighting

Provide area lighting at 35 outdoor locations, including roadway luminaires and path and sidewalk lighting.

i. Replace Drum Storage Racks

Provide enclosures and replace racks and catch trays for 18 existing drum storage racks.

j. Building 77 Chemical Storage Facility

A proposed chemical storage facility will be located near Building 77. It will be a one-story, 600 gross square foot steel-framed structure with reinforced concrete spread footings and floor slab, metal roof deck and siding, insulation, and built-up roofing. This facility will have steel shelving, utilities, lighting, and ventilation. All interior exposed metals will have corrosion-resistant coatings.

k. Buildings 70-70A, Replace Acid Pipe Fittings

Replace deteriorated pyrex fittings. Existing laboratory furniture, piping, and electrical services must be re-routed for access to acid pipe fittings.

The government-owned additions and improvements described herein are located on leased land owned by the Regents of the University of California.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Environmental health & safety project
Lawrence Berkeley Laboratory (LBL)
Berkeley, California

2. Project No.: 88-R-806

9. Purpose, Justification of Need, and Scope of Project

a. Air Sampling/Monitoring

Equipment and facilities are old, deteriorated, and in need of upgrading or replacement. Compliance with DOE regulations, protection of environment, and personnel health and safety must be maintained.

b. Building 26 Addition

Medical Services have severe functional space limitations. Certain patient examination procedures occur in the corridor. Supplies and equipment are stored in the corridor. There is no room available for either private staff conferences or staff/patient consultations.

c. Building 77 Waste Treatment Unit Replacement

The existing waste treatment facility is inadequate and unreliable. Spent solutions are presently trucked to an off-site commercial waste treatment facility at great expense and risk of transportation hazards. Plating shop operations are hampered by existing treatment facility breakdown, maintenance problems and obsolescence.

d. Monitor Underground Fuel Tanks

New State of California regulations require the monitoring of underground chemical storage tanks.

e. Ventilation Improvements

Controls are obsolete and/or inoperative, requiring replacement. Laboratory HVAC systems are out of balance; equipment is defective; ducts are deteriorated and require repair or replacement.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Environmental health & safety project
Lawrence Berkeley Laboratory (LBL)
Berkeley, California

2. Project No.: 88-R-806

9. Purpose, Justification of Need, and Scope of Project (continued)

f. Water Supply Cross-Connection

Hillwide drinking water supplies should be safeguarded with cross-connection devices between potable and non-potable water systems. Existing devices are old and deteriorated. Old cross-connections need approved devices added to them.

g. Emergency Shower Water Supply Conversion

At many locations, showers are at present supplied from industrial water supply. They need to be converted to potable water supply for personnel safety.

h. Area Lighting

In certain poorly lit outdoor areas, additional exterior lighting will improve personnel safety and minimize risk of injury to pedestrians and motorists.

i. Replace Drum Storage Racks

Existing sitewide installations have deteriorated with time; some areas lack proper containment provisions. New environmental concerns require proper handling to avoid leaks and spills.

j. Building 77 Chemical Storage Facility

There is an immediate need for adequate safe storage space for current activities. Chemicals used in the Building 77 Plating Shop are now stored in a crowded room or outside the building, where they are exposed to weather.

k. Buildings 70-70A, Replace Acid Pipe Fittings

In laboratories where hydrofluoric acid has been used extensively, the glass pipe, traps, and metal couplings have eroded and deteriorated.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Environmental health & safety project
 Lawrence Berkeley Laboratory (LBL)
 Berkeley, California

2. Project No.: 88-R-806

10. Details of Cost Estimate *

	<u>Item Costs</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ about 18% of construction, Item b.....		\$ 1,127
b. Construction costs.....		6,264
(1) Improvements to land	\$ 32	
(2) Buildings.....	3,900	
(3) Other construction (other than buildings).....	435	
(4) Special facilities	833	
(5) Utilities	1,064	
c. Standard equipment		1,193
d. Removal costs less salvage		20
Subtotal.....		<u>8,604</u>
e. Contingency at about 20% (of which \$780 is for building construction).....		1,721
Subtotal.....		<u>\$10,325</u>
Less remaining funds to new Office of Environmental Management.....		- 1,075
Total estimated cost.....		<u>\$ 9,250</u>

* Conceptual design is complete.

11. Method of Performance

Engineering, design and inspection will be performed under a negotiated Architect-Engineer Subcontract. Inspection, some engineering and some construction will be accomplished by LBL forces. Construction and Procurement will be accomplished by fixed price subcontracts awarded on the basis of competitive bids.

DEPARTMENT OF ENERGY
FY 1991 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS
ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Rehabilitate laboratory space Argonne National Laboratory (ANL) Argonne, Illinois	2. Project No.: 87-R-753
3. Date A-E Work Initiated: 1st Qtr. FY 1987	5. Previous Cost Estimate: None Date: None
3a. Date physical construction starts: 1st Qtr. FY 1988	6. Current Cost Estimate: \$12,035 Less amount of PE&D: 0 Net Cost Estimate: \$12,035 Date: September 1988
4. Date Construction Ends: 3rd Qtr. FY 1991	

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1987	\$12,035	\$1,235	\$1,235	\$ 521
	1988	0	3,889 ^{a/}	3,889 ^{a/}	2,000
	1989	0	2,800	2,800	1,992
	1990	0	2,574	2,574	4,208
	1991	0	1,500	1,500	3,007
	1992	0	37	37	953

8. Brief Physical Description of Project

This project is the first phase of a two phase project that will rehabilitate a large multipurpose laboratory and office building at ANL (Building 200). The 359,600 gross square feet brick structure was put into service in 1951 and has a replacement value of \$86,100,000 and an expended useful life of 60%. Phase I will rehabilitate wings A-F, which totals 166,000 gross square feet of space. The remainder of the building will be renovated in Phase II.

^{a/} \$289,000 reprogrammed from prior year closed out projects.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Rehabilitate laboratory space
Argonne National Laboratory (ANL)
Argonne, Illinois
2. Project No.: 87-R-753
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8. Brief Physical Description of Project (continued)

The workscope will encompass essentially all aspects of building construction, except structure and roofing¹, including (as needed): building envelope (windows, tuckpointing); building interiors (painting, partition, floor tile, ceiling tile); electrical main distribution systems (transformers, switchgear, wiring); lighting (panels, fixtures, wiring), heating ventilation and air conditioning (HVAC) (pumps, fans, filters, coils, heat exchangers, air compressors, controls, ductwork, piping²); plumbing (toilet fixtures, water heaters, pumps, water and drain piping); laboratory and process piping (water heaters, distilled water system, air compressors and driers, nitrogen and oxygen storage tanks and evaporators, gas, water and drain piping); elevators (hydraulics controls cabs); removal and disposal of potentially contaminated or hazardous materials such as exhaust ductwork, laboratory drain piping and asbestos insulation.

9. Purpose, Justification of Need for, and Scope of Project

By the time this project is funded, the building will have been in constant use as a major laboratory and office building for more than 35 years. The needs of scientific programs have changed dramatically in this time period. The facility does not meet current construction codes and safety standards. In addition, systems that provide electric power, process fluids, heating, cooling, humidity control, clean air delivery and laboratory exhaust for control of hazardous materials are becoming less reliable each year because of aging. Adequate maintenance is difficult and very costly because replacement parts for many of the components are no longer available and shop effort is required for temporary repairs.

¹ Included under on-going Project No. 85-R-701 "Replace Laboratory Roofs".

² Chillers and cooling towers are included under Project No. 85-R-709 "Central Chilled Water System "Phase I".

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Rehabilitate laboratory space Argonne National Laboratory (ANL) Argonne, Illinois	2. Project No.: 87-R-753
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9. Purpose, Justification of Need for, and Scope of Project (continued)

The need exists, therefore, for a total upgrade of the building as described in the work scope above. If this facility upgrade is not supported, maintenance effort to keep the facility in an operational condition can be expected to continuously increase. Shutdowns due to major building equipment failures can be expected to cause major interruptions in current and future R&D activities and require long term experiments to start again. Health, safety, security and environmental risks will continue to increase. Personnel morale and productivity are also likely to be adversely affected.

10. Details of Cost Estimate*:

	<u>Total Cost</u>
a. Engineering, design, and inspection at approximately 17% of construction costs, item b.....	\$ 1,530
b. Construction costs.....	9,000
c. Contingency at approximately 14% of above costs.....	1,505
Total estimated cost.....	\$ 12,035

*Based upon a completed conceptual design and current cost data.

11. Method of Performance

Engineering, design and inspection will be performed by Laboratory engineering personnel, aided by outside A/E firms. Construction will be accomplished by fixed-price contract awarded specializing in fire protection design. Construction and procurement will be accomplished by fixed-price contracts and purchase orders awarded on the basis of competitive bidding.

DEPARTMENT OF ENERGY
 FY 1991 CONGRESSIONAL BUDGET REQUEST
 CONSTRUCTION PROJECT DATA SHEET
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT

In-house Energy Management
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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- | | |
|---|--|
| 1. Title and Location of Project: Modifications for Energy Management,
Various Locations | 2. Project No. 91-E-500 |
| 3. Date A-E work initiated: 2nd Qtr. FY 1991 | 5. Previous cost estimate:
Date: None |
| 3a. Date physical construction starts: 4th Qtr. FY 1991 | 6. Current cost estimate: \$17,000
Date: May 1989 |
| 4. Date construction ends: 3rd Qtr. FY 1994 | |
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7. Financial Schedule: Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1991	\$17,000	\$17,000	\$17,000	\$1,700
1992				5,950
1993				5,950
1994				3,400

8. Brief Physical Description of Project:

This line item is for various small retrofit projects to reduce energy consumption. These small modifications will be selected on the basis of return on investment and energy savings. Projects compete on a DOE-wide basis for funding under this lump sum item, thus assuring the greatest return and greatest energy savings per investment dollar for the Department. The average payback for this line item based on past experience, is less than 3 years.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Modifications for Energy Management, Various Locations 2. Project No. 91-E-500

9. Purpose, Justification of Need for, and Scope of Project:

Fewer than 75 of the most economical projects will be funded. The projects range from less than \$5,000 to \$1,200,000. The projects are for HVAC modifications, insulation of buildings, waste heat recovery, installation of more efficient lighting, steam line modifications, power factor improvements, etc. The quick payback projects selected for this line item will have the following total life-cycle cost effect utilizing a present value analysis:

Average Savings to Investment Ratio (SIR)	6.0
Average Payback Period	3.0 years
Total Annual Energy Savings	687 billion Btus
Annual Dollar Savings	\$5,270,000

10. Details of Cost Estimate:

There are approximately 75 projects each with total estimated cost (TEC) less than \$1,200,000 which will be funded by this line item. The projects will be selected on the basis of economic return.

11. Method of Performance:

Design and inspection will be performed under negotiated architect-engineer contracts. Construction and procurement will be accomplished by fixed-price contracts awarded on the basis of competitive bidding.

12. Funding Schedule of project funding and Other Related Requirements:

Not required.

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

Not required.