

DEPARTMENT OF ENERGY
FY 1990 CONGRESSIONAL BUDGET REQUEST
OFFICE OF ENERGY RESEARCH
OVERVIEW

MULTIPROGRAM ENERGY LABORATORIES-FACILITIES SUPPORT

Attainment of 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 maintain the capabilities of these laboratories. This is accomplished by supporting activities and projects which counter the problems of (1) aging and obsolescence of facilities, (2) environmental noncompliance, and (3) safety and health inadequacies. The program is fully integrated with the Department's institutional planning process which overviews the overall management and utilization of the multiprogram laboratories.

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

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, health and environmental compliance levels; and improved productivity.

The program consists of two subprograms. The General Purpose Facilities subprogram originated in FY 1981 as a broad program for rehabilitation, upgrade or replacement of deficient buildings, utilities, roads, railroads and other facilities at the laboratories. The Environmental Compliance-ORNL subprogram originated in FY 1985 to address Energy Research environmental deficiencies at ORNL.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 OFFICE OF ENERGY RESEARCH
 (dollars in thousands)

LEAD TABLE

Multiprogram Energy Laboratories - Facilities Support

Activity	FY 1988 Actual	FY 1989 Estimate	FY 1990 Base	FY 1990 Request	Program Change Request vs Base	
					Dollar	Percent
General Purpose Facilities						
Construction.....	\$28,500	\$31,255	\$31,255	\$32,497	+ 1,242	+ 4%
Environmental Compliance-ORNL						
Operating.....	12,900	8,770	8,770	9,000	+ 230	+ 3%
Capital Equipment.....	400	305	305	0	- 305	- 100%
Construction.....	11,800	15,400	15,400	11,500	- 3,900	- 25%
Subtotal.....	25,100	24,475	24,475	20,500	- 3,975	- 16%
Total.....	\$53,600	\$55,730	\$55,730	\$52,997	- 2,733	- 5%
Operating.....	(\$12,900)	(\$8,770)	(\$8,770)	(\$9,000)	+ 230	+ 3%
Capital Equipment.....	(400)	(305)	(305)	0	- 305	- 100%
Construction.....	(40,300)	(46,655)	(46,655)	(43,997)	- 2,658	- 6%

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

DEPARTMENT OF ENERGY
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 ENERGY SUPPLY RESEARCH AND DEVELOPMENT
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SUMMARY OF CHANGES

Multiprogram Energy Laboratories - Facilities Support

FY 1989 Appropriation.....	\$ 55,730
- Continue with environmental safety and health projects at various locations for the General Purpose Facilities subprogram.....	+ 3,000
- Continue and/or complete ongoing projects, including those postponed from FY 1989.....	- 3,176
- Maintain Environmental Compliance operating expenses.....	+ 230
- Reduce general plant projects for ORNL Environmental Compliance subprogram	- 1,500
- Continue project 88-R-830 for liquid low level waste collection and transfer system upgrade.....	- 1,287
FY 1990 Congressional Budget Request.....	<u>\$ 52,997</u>

DEPARTMENT OF ENERGY
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ENERGY SUPPLY RESEARCH AND DEVELOPMENT
OFFICE OF ENERGY RESEARCH
(dollars in thousands)

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 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 the 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, environmental, safety, and health requirements. This program addresses the backlog of facility needs in a prioritized and systematic manner. Highest priority is assigned to those projects that address urgent environmental, 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.

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 1988	FY 1989	FY 1990	% Change
General Purpose Facilities...	\$ 28,500	\$ 31,255	\$ 32,497	+ 4

II. B. Major Laboratory and Facility Funding

Argonne National Laboratory....	\$ 9,598	\$ 9,010	\$ 9,028	--
Brookhaven National Laboratory.	1,663	6,000	9,600	+ 60
Hanford Engineering Development Laboratory*.....	575	375	0	- 100
Idaho National Engineering Lab*.	380	490	399	- 19
Lawrence Berkeley Laboratory....	6,190	7,848	7,137	- 9
Lawrence Livermore Nat. Lab*....	150	312	0	- 100
Oak Ridge National Laboratory..	9,004	4,560	4,165	- 9
Pacific Northwest Laboratory...	940	2,660	2,168	- 19
Total.....	\$ 28,500	\$ 31,255	\$ 32,497	+ 4

* 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 1988	FY 1989	FY 1990
Construction	Continues fourteen previously started projects consistent with planned schedules (\$22,730). Allows for nine	Will provide for continuation of 19 ongoing projects (\$25,860) consistent with planned schedules and initiation	Will provide for continuation of 12 ongoing projects and 11 postponed projects (\$29,497) consistent with

III. General Purpose Facilities (Cont'd)

Program Activity

Construction (Cont'd)	new starts, including five environmental related projects, one fire safety project, two utility upgrade projects, and one building rehabilitation project. Project summaries are provided in Section III below.(\$5,770)	of 5 new projects: 2 environmental related projects, 1 road safety project, 1 fire protection project, and 1 utility project. (\$5,395)	planned schedules and initiation of 5 environmental safety and health projects. (\$3,000)
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Total General Purpose Facilities	\$ 28,500	\$31,255	\$32,497
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I. Preface: Environmental Compliance-ORNL

The Environmental Compliance subprogram originated in FY 1985 to address environmental deficiencies at ORNL. These deficiencies relate to: (1) the systems for collecting, processing and disposing of currently generated liquid, gaseous and solid hazardous wastes, and (2) the past disposal of previously generated wastes which are not in compliance with current environmental regulations. The program will upgrade all operational systems except those specific portions assigned to other DOE programs to meet required environmental standards and will perform required remedial actions necessary to clean up environmentally contaminated areas that are related to past Energy Research program activities.

The total estimated cost to ensure environmental compliance of current operating systems is estimated to be \$200,000,000 with most of this being capital funds. A large percentage of these costs (\$125,000,000) relate to liquid waste systems. These include the low-level radioactive waste systems, the process waste systems, the sewer systems, and the storm sewer systems. All operational systems are 40 or more years old and in need of extensive rehabilitation and partial replacement. This FY 1990 budget will provide funds to continue the high priority construction project related to the liquid waste system at ORNL. This is the Low-Level Waste Collection and Transfer System Upgrade (88-R-830, TEC \$35,000,000).

II. A. Summary Table

Program Activity	FY 1988	FY 1989	FY 1990	% Change
Operating				
Upgrade Operational Systems...	\$ 4,600	\$ 4,470	\$ 4,800	+ 7
Remedial Actions.....	8,300	4,300	4,200	- 2
Total Operating.....	12,900	8,770	9,000	+ 3
Capital Equipment.....	400	305	0	- 100
Construction.....	11,800	15,400	11,500	- 25
Total Environmental Compliance-ORNL.....	\$ 25,100	\$ 24,475	\$ 20,500	- 16

II. B. Major Laboratory and Facility Funding

Oak Ridge National Laboratory..	\$ 25,100	\$ 24,475	\$ 20,500	- 16
Total.....	\$ 25,100	\$ 24,475	\$ 20,500	- 16

III. Activity Descriptions

Program Activity	FY 1988	FY 1989	FY 1990
Operating			
Upgrade Operational Systems	Continue characterization and investigation of current waste handling and environmental control systems, and identification of additional capabilities to meet new or changing regulations or minimum acceptable practices. (\$4,600)	Continue FY 1988 activities and implementation of planning and prioritization of identified upgrade activities. (\$4,470)	Continue FY 1989 program at approximately same level of effort. (\$4,800)

II. Environmental Compliance (Cont'd)

Program Activity	FY 1988	FY 1989	FY 1990
Remedial Actions	Continue remedial investigations and feasibility studies on previously contaminated sites, and continue development of a groundwater monitoring system. (\$8,300)	Continue remedial investigations and feasibility studies on previously contaminated sites that are the responsibility of Energy Research, and continue development of groundwater monitoring systems, as needed and perform surveillance, maintenance and repair of Energy Research contaminated facilities. (\$4,300)	Continue remedial investigations and feasibility studies on previously contaminated sites that are the responsibility of Energy Research, and continue development of groundwater monitoring systems, as needed and perform surveillance, maintenance and repair of Energy Research contaminated facilities. (\$4,200)
Subtotal, Operating Expenses	\$ 12,900	\$ 8,770	\$ 9,000
Capital Equipment	Provides equipment needed to support cleanup activities. (\$400)	Provides equipment needed to support cleanup activities. (\$305)	No activity.
Subtotal, Capital Equipment	\$400	\$305	\$0
Construction	Continue the Non-Radiological Process Waste Treatment Facilities Project (86-R-801). (\$7,000)	Complete the ORNL Non-Radiological Process Waste Treatment Facilities Project (86-R-801). (\$1,113)	No activity.
	Start the Low-Level Waste Collection and Transfer Systems Upgrade (88-R-830). (\$4,800)	Continue the ORNL Low-Level Waste Collection and Transfer Systems Upgrade (88-R-830). (\$11,787)	Continue the ORNL Low-Level Waste Collection and Transfer Systems Upgrade (88-R-830). (\$10,500)

II. Environmental Compliance (Cont'd)

Program Activity	FY 1988	FY 1989	FY 1990
No Activity.		GPP undertaken to correct current deficiencies in operating systems. (\$2,500)	GPP undertaken to correct current deficiencies in operating systems. (\$1,000)
Subtotal Construction	\$11,800	\$15,400	\$11,500
Total Environmental Compliance	\$25,100	\$24,475	\$20,500
Total Multiprogram Energy Laboratories - Facilities Support	\$53,600	\$55,730	\$52,997

DEPARTMENT OF ENERGY
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 ENERGY SUPPLY RESEARCH AND DEVELOPMENT
 (dollars in thousands)

KEY ACTIVITY SUMMARY

CONSTRUCTION PROJECTS

Multiprogram Energy Laboratories - Facilities Support

IV. Construction Project Summary

<u>Project No.</u>	<u>Project Title</u>	<u>Total Prior Year Obligations</u>	<u>FY 1989 Appropriated</u>	<u>FY 1990 Request</u>	<u>Unappropriated Balance</u>	<u>TEC</u>
Multiprogram Energy Laboratories - General Purpose Facilities (MEL-GPF)						
90-R-119	Laboratory Wastewater Treatment Plant Improvements (ANL)	0	0	500	6,140	6,640
90-R-118	Fire Protection Upgrade (ORNL)	0	0	1,340	1,960	3,300
90-R-117	Slope/Seismic Stabilization (LBL)	0	0	500	3,200	3,700
90-R-116	Hazardous Waste Management Project (BNL)	0	0	160	2,240	2,400
90-R-115	Laboratory and Sanitary Sewer Collection System Rehabilitation (ANL)	0	0	500	1,720	2,220
90-R-113	Electrical Systems Upgrade (ORNL) ^{a/}	0	0	855	1,445	2,300
90-R-112	Measurements and Controls Support Facility (ORNL) ^{a/}	0	0	1,100	3,330	4,430

<u>Project No.</u>	<u>Project Title</u>	<u>Total Prior Year Obligations</u>	<u>FY 1989 Appropriated</u>	<u>FY 1990 Request</u>	<u>Unappropriated Balance</u>	<u>TEC</u>
90-R-111	Original Labsite Substation (LBL) ^{a/}	0	0	250	2,700	2,950
90-R-110	Instrumentation Support Laboratory Rehabilitation (LBL) ^{a/}	0	0	200	1,800	2,000
90-R-109	Building Addition (BNL) ^{a/}	0	0	1,700	0	1,700
90-R-108	Central Shops Alteration and Addition (BNL) ^{a/}	0	0	310	1,370	1,680
90-R-107	Boiler Replacement (BNL) ^{a/}	0	0	324	3,196	3,520
90-R-106	Rehabilitation of Domestic and Firewater, Pumping and Storage Systems (ANL) ^{a/}	0	0	150	1,525	1,675
90-R-100	Transportation Facility Replacement (ANL) ^{a/}	0	0	350	3,750	4,100
89-R-113	Environmental Upgrades (BNL) ^{a/}	0	1,500	3,262	4,838	9,600
89-R-112	Replace PCB Transformers (ANL)	0	1,000	1,380	0	2,380
89-R-111	Building Utilities (PNL)	0	600	2,168	232	3,000
89-R-108	Roads and Parking Safety Improvements (ORNL) ^{a/}	0	1,650	870	0	2,520
89-R-102	Fire Protection Improvements Phase III (BNL) ^{a/}	0	645	2,355	0	3,000
88-R-817	Upgrade Fire Protection (ORNL)	770	980	0	0	1,750
88-R-814	Sanitary Sewage Treatment Facility (PNL)	940	2,060	0	0	3,000
88-R-812	Hazardous Waste Handling Facility (LBL) ^{a/}	500	2,800	1,350	0	4,650

<u>Project No.</u>	<u>Project Title</u>	Total Prior Year <u>Obligations</u>	FY 1989 <u>Appropriated</u>	FY 1990 <u>Request</u>	Unappropriated <u>Balance</u>	<u>TEC</u>
88-R-809	Plant Modifications to Comply with EPA Requirements (ANL)	820	1,000	0	0	1,820
88-R-807	Electrical System Rehabilitation Phase I (ANL) ^{a/}	350	1,150	3,000	560	5,060
88-R-806	Environmental Health and Safety Project (LBL) ^{a/}	850	3,003	4,837	1,635	10,325
88-R-805	Environmental Improvements (BNL)	565	1,946	1,489	0	4,000
88-R-804	Building Piping Systems Upgrade (ORNL)	520	1,330	0	0	1,850
88-R-802	Multiprogram Laboratory Building Rehabilitation (BNL)	455	1,445	0	0	1,900
87-R-758	Rehabilitate Mechanical Utilities (LBL)	3,915	1,585	0	0	5,500
87-R-757	Electrical Systems Rehabilitation (LBL)	2,140	460	0	0	2,600
87-R-756	Water Line Replacement (ANL) ^{a/}	2,103	2,560	537	0	5,200
87-R-755	Mechanical Systems Rehabilitation (ANL)	2,700	500	0	0	3,200
87-R-753	Rehabilitate Laboratory Space (ANL) ^{a/}	5,124	2,800	2,611	1,500	12,035
87-R-752	Piping System Restoration (ORNL)	3,200	600	0	0	3,800

<u>Project No.</u>	<u>Project Title</u>	<u>Total Prior Year Obligations</u>	<u>FY 1989 Appropriated</u>	<u>FY 1990 Request</u>	<u>Unappropriated Balance</u>	<u>TEC</u>
86-R-726	Fire Protection Improvements, Phase II (BNL)	2,536	464	0	0	3,000
85-R-707	Hanford Site Fire Alarm System Upgrade (RL)	4,475	375	0	0	4,850
85-R-706	Medical Facilities (LLNL)	6,988	312	0	0	7,300
84-ER-103	Road Repairs (INEL, LBL, RL, ANL) ^{b/}	<u>16,862</u>	<u>490</u>	<u>399</u>	<u>0</u>	<u>17,751</u>
Subtotal, General Purpose Facilities		55,813	31,255	32,497	43,141	XXX
<u>Environmental Compliance (ORNL)</u>						
90-R-770	General Plant Projects	0	0	1,000	0	1,000
89-R-770	General Plant Projects	0	2,500	0	0	2,500
88-R-830	Liquid Low-Level Collection and Transfer System Upgrade (ORNL)	4,800	11,787	10,500	7,913	35,000
86-R-801	Non-Radiological Process Waste Treatment Project (ORNL)	<u>16,887</u>	<u>1,113</u>	<u>0</u>	<u>0</u>	<u>18,000</u>
Subtotal, Environmental Compliance		<u>21,687</u>	<u>15,400</u>	<u>11,500</u>	<u>7,913</u>	<u>XXX</u>
Total, MEL-FS		<u>\$ 77,500</u>	<u>\$ 46,655</u>	<u>\$ 43,997</u>	<u>\$51,054</u>	<u>XXX</u>

^{a/} A reprogramming for FY 1989 is in process for these projects. This FY 1990 budget has been prepared assuming that the reprogramming will be approved.

^{b/} This program is no longer responsible for INEL, but is committed to completing any projects it started at this laboratory under its previous responsibility. This lab is the responsibility of Defense Programs.

FY 1990 CONGRESSIONAL BUDGET REQUEST
ENERGY SUPPLY RESEARCH AND DEVELOPMENT
(dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support
General Purpose Facilities

1. Project title and location: 90-R-119 Laboratory Wastewater Treatment
Plant Improvements
Argonne National Laboratory
Argonne, Illinois

Project TEC: \$ 6,640
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	\$ 500	\$ 500	\$ 500
1991	2,000	\$2,000	\$1,600
1992	4,140	\$4,140	\$4,540

3. Narrative:

- (a) Rehabilitation of the existing treatment facilities and additional work will be provided including independent physical, biological, chemical and radioactive waste treatment to obtain removals of organic compounds and heavy metals, and radioactivity.
- (b) Inadequate facilities exist for treatment of radioactivity, biological and chemical deoxygenating wastes, organic compounds and metals. The emergency overflow pond for peak flow discharges is unlined and continued discharge to it could cause harm to the aquatic environment.
- (c) First year funding will provide for completion of architectural/engineering efforts.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support
General Purpose Facilities

1. Project title and location: 90-R-118 Fire protection upgrade
Oak Ridge National Laboratory
Oak Ridge, Tennessee

Project TEC: \$ 3,300
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	\$1,340	\$1,340	\$ 500
1991	1,960	1,960	1,100
1992	0	0	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) The first year funding for the project will provide for engineering of the project and preliminary construction activities.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support
 General Purpose Facilities

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	\$ 500	\$ 500	\$ 220
1991	2,200	2,200	1,510
1992	1,000	1,000	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) First year funding will provide for completion of architectural/engineering efforts.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support
General Purpose Facilities

1. Project title and location: 90-R-116 Hazardous waste management project
Brookhaven National Laboratory
Upton, New York
- Project TEC: \$ 2,400
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	\$ 160	\$ 160	\$ 130
1991	2,240	\$2,240	\$1,250
1992	0	\$ 0	\$1,020

3. Narrative:

- (a) This project is part of a continuing effort to modify existing Hazardous Waste Management Facilities and provide additional facility support in the areas of both radioactive and non-radioactive hazardous waste material processing and storage.
- (b) Modifications and upgrades which will be accomplished under the scope of this project will eliminate several areas of non-conformance with the Environmental Protection Agency (EPA), New York State Department of Environmental Conservation (NYSDEC), and Suffolk County Department of Health Services (SCDHS) regulations.
- (c) First year funding will provide for completion of architectural/engineering efforts.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support
 General Purpose Facilities

1. Project title and location: 90-R-115 Laboratory and Sanitary Sewer
 Collection System Rehabilitation
 Argonne National Laboratory
 Argonne, Illinois
- Project TEC: \$ 2,220
 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	\$ 500	\$ 500	\$ 450
1991	1,000	\$1,000	\$ 750
1992	720	\$ 720	\$1,020

3. Narrative:

- (a) A program for rehabilitation of all broken and leaking laboratory and sanitary sewers which serve permanent buildings and areas at ANL will be provided. Also, construction of new relief sewers where the capacity is insufficient is proposed.
- (b) Many of the sewers have either collapsed due to bearing load capacity being exceeded, infiltration/inflow from leaky joints or direct storm water tie-in connections, or exhibited hydraulic-limiting flow characteristics from root intrusion and are undersized for future conditions.
- (c) First year funding will provide for completion of architectural/engineering efforts.

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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-113 Electrical systems upgrade, Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee
- Project TEC: \$ 2,300
 Start Date: FY 1989
 Completion Date: FY 1991

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$ 855	\$ 855	\$ 200
1991	\$1,445	\$1,445	\$2,100

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) \$855,000 is requested for FY 1990 funding. The Architect/Engineering contract will be negotiated and detailed design will be completed. Construction will start late in FY 1990.

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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-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	\$1,100	\$1,100	\$ 965
1991	\$3,100	\$3,100	\$1,630
1992	\$ 230	\$ 230	\$1,835

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) \$1,100,000 is requested for FY 1990 funding. The Architect/Engineering contract will be negotiated and detailed design will be completed. Construction will start early in FY 1991.

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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-109 Building addition, Project TEC: \$ 1,700
 Brookhaven National Start Date: FY 1990
 Laboratory (BNL), Completion Date: FY 1991
 Upton, New York

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$1,700	\$1,700	\$800
1991	\$0	\$0	\$900

3. Narrative:

- (a) This project provides for a new two-story building and basement of approximately 12,500 gross sq. ft., a net area of about 9,000 sq. ft. The building will house the Networking, Engineering, and Telecommunication Division of the Applied Mathematics Department.
- (b) The proposed building is to provide appropriate laboratory, operating, office, conference, library, training, and storage space in order to alleviate some of the severe overcrowding and constraint of activities which exist in the existing building due to lack of sufficient space. There are no other suitable alternatives for housing these essential functions.
- (c) Full project funding of \$1,625,000 is requested in FY 1990 to cover detailed design and to contract for construction.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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: 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	\$310	\$310	\$300
1991	\$1,370	\$1,370	\$1,380

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) \$310,000 is requested for FY 1990 funding. During FY 1990 detailed design (by a negotiated Architect/Engineering contractor) will be completed.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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: 90-R-107 Boiler replacement, Project TEC: \$ 3,520
 Brookhaven National Start Date: FY 1990
 Laboratory (BNL), Upton, Completion Date: FY 1992
 New York

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$324	\$324	\$200
1991	\$3,196	\$3,196	\$770
1992	\$0	\$0	\$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) \$324,000 is requested for FY 1990 funding. During FY 1990 detailed design (by a negotiated Architect/Engineering contractor) will be completed.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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: 90-R-106 Rehabilitation of domestic and firewater, pumping and storage system, Argonne National Laboratory (ANL) Argonne, Illinois
- Project TEC: \$ 1,675
 Start Date: FY 1989
 Completion Date: FY 1992

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$150	\$150	\$150
1991	\$1,000	\$1,000	\$1,000
1992	\$525	\$525	\$525

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) \$150,000 is requested for FY 1990 funding. During FY 1990 detailed design (by a negotiated Architect/Engineering contractor) will be completed.

DEPARTMENT OF ENERGY
FY 1990 CONGRESSIONAL BUDGET REQUEST
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: 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	\$350	\$350	\$150
1991	\$1,400	\$1,400	\$1,470
1992	\$2,350	\$2,350	\$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) \$350,000 is requested for FY 1990 funding. During FY 1990 detailed design (by a negotiated Architect/Engineering contractor) will be completed.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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: 89-R-113 Environmental upgrades, Brookhaven National Laboratory (BNL) Upton, New York
- Project TEC: \$ 9,600
 Start Date: FY 1989
 Completion Date: FY 1992

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1989	\$1,500	\$1,500	\$1,000
1990	\$3,262	\$3,262	\$2,500
1991	\$3,000	\$3,000	\$3,062
1992	\$1,838	\$1,838	\$3,038

3. Narrative:

- (a) This project will close a landfill site and stabilize the potential leachate from the area and will remove radioactive sludge as well as holding tanks at a waste processing facility. Decontamination and disposal will be conducted on three 100,000 gallon above ground tanks located at the radioactive liquid waste concentration facility. Environmental monitoring improvement phase of the project is designed to meet changing operational and regulatory needs.
- (b) The purpose of this project is to take action to prevent, control, and abate environmental pollution.
- (c) \$3,262,000 is requested for FY 1990 funding. Construction will start in early FY 1990.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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: 89-R-112 Replace PCB Transformers, Argonne National Laboratory (ANL), Argonne, Illinois

Project TEC: \$ 2,380
 Start Date: FY 1989
 Completion Date: FY 1990

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1989	\$1,000	\$1,000	\$600
1990	\$1,380	\$1,380	\$1,780

3. Narrative:

- (a) This project will provide for the replacement of 26 PCB transformers in accordance with an EPA ruling and the low-voltage switchgear associated with one of the transformers.
- (b) The EPA has taken an uncompromising position to PCBs. PCBs are extremely stable compounds which are soluble in the human body and accumulate in human tissue. They are highly suspect in the cause of human cancer.
- (c) \$1,380,000 is requested for FY 1990 funding. Construction will be ongoing and completed in FY 1990.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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: 89-R-111 Building utilities,
 Phase I, Pacific Northwest
 Laboratory (PNL),
 Richland, Washington
- Project TEC: \$ 3,000
 Start Date: FY 1989
 Completion Date: FY 1991

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1989	\$ 600	\$ 600	\$ 600
1990	\$2,168	\$2,168	\$2,168
1991	\$ 232	\$ 232	\$ 232

3. Narrative:

- (a) This project provides for renovations to existing multiprogram laboratory facilities to correct deficiencies of miscellaneous multiprogram facilities systems, while meeting current standards of health, safety, security, and energy conservation and, at the same time, extending the useful life of the buildings.
- (b) The primary reason for this project is to renovate and extend the useful life of major DOE multiprogrammatic facilities which are critical to the DOE mission at Hanford, and promote safe and efficient operations. This project is necessary to reverse the accelerating damage being inflicted on existing facilities and their building systems and to keep these structures and building service systems from deteriorating further.
- (c) \$2,168,000 is requested for FY 1990 funding. The Architect/Engineering contract will be negotiated, detailed design will be completed, and construction will begin.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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: 89-R-108 Roads and parking safety improvements,
 Oak Ridge National Laboratory
 (ORNL), Oak Ridge, Tennessee
- Project TEC: \$ 2,520
 Start Date: FY 1989
 Completion Date: FY 1991

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1989	\$1,650	\$1,650	\$400
1990	\$870	\$870	\$1,400
1991	\$0	\$0	\$720

3. Narrative:

- (a) This project will involve a partial reconstruction of Bethel Valley Road which is the primary access road to ORNL.
- (b) This project will mitigate significant deficiencies in safety, function, and capacity by rebuilding, replacing, and adding to selected roads, traffic controls systems, and parking areas.
- (c) Funding of \$870,000 is requested in FY 1990. Construction will be ongoing in FY 1990.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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: 89-R-102 Fire protection improvements (Phase III), Brookhaven National Laboratory (BNL), Upton, New York
- Project TEC: \$ 3,000
 Start Date: FY 1989
 Completion Date: FY 1992

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1989	\$645	\$645	\$150
1990	\$2,355	\$2,355	\$800
1991	\$0	\$0	\$1,500
1992	\$0	\$0	\$550

3. Narrative:

- (a) This project provides for the design, fabrication and installation of various fire protection improvements consisting of providing automatic sprinkler protection in facilities designated as high loss potential.
- (b) The purpose of this project is to reduce the risk of loss due to fire at BNL. For this project, only key facilities have been included, such as buildings directly involved in DOE program activities and vital support buildings.
- (c) \$2,335,000 is requested for FY 1990 funding. Construction will start in early FY 1990.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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: 88-R-807 Electrical System Rehabilitation, Phase I
 Argonne National Laboratory (ANL)
 Argonne, Illinois
- Project TEC: \$ 5,060
 Start Date: FY 1988
 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	1,150
1990	3,000	3,000	2,990
1991	560	560	873

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) \$3,000,000 is requested for FY 1990 funding. Construction will be ongoing this year.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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: 88-R-806 Environmental Health & Safety Project Project TEC: \$10,325
 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	3,003	3,003	3,284
1990	4,837	4,837	3,038
1991	1,635	1,635	3,944

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) \$4,837,000 is requested for FY 1990 funding. Construction will be ongoing this year.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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-756 Water Line Replacement Project TEC: \$ 5,200
 Argonne National Laboratory (ANL) Start Date: FY 1987
 Argonne, Illinois Completion Date: FY 1990

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1987	\$ 566	\$ 566	\$ 138
1988	1,537 ^{a/}	1,537 ^{a/}	674
1989	2,560	2,560	2,000
1990	537	537	2,388

3. Narrative:

- (a) This project will rehabilitate deteriorated water lines in three water distribution systems which serve permanent building areas at ANL. The three systems are: 1) domestic/fire water, 2) laboratory water, and 3) canal water. Approximately 18 miles of cast iron water lines will be replaced with polyvinyl chloride (PVC) pipe and reinforced concrete pipe (RCP).
- (b) Existing domestic/fire water system lines are becoming unreliable for fire protection purposes due to soil-side corrossions of the pipes. Pipe breaks are becoming more frequent and are very disruptive to operations. Canal water and laboratory water system lines are co-located with domestic/fire water lines and are heavily scaled reducing their rated flow significantly.
- (c) \$537,000 is requested for FY 1990 funding. Construction will be completed in FY 1990.

^{a/} \$37,000 reprogrammed from prior year closed out projects.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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
 Argonne National Laboratory (ANL)
 Argonne, Illinois
- Project TEC: \$12,035
 Start Date: FY 1987
 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	4,100
1990	2,611	2,611	4,100
1991	1,500	1,500	1,960

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) \$2,611,000 is requested for FY 1990 funding. Construction will be ongoing.

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

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 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: 84-ER-103 Road Repairs Project TEC: \$17,751
 Various locations Start Date: FY 1984
 (ANL, INEL, LBL, RL) Completion Date: FY 1990

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1984	\$ 6,500	\$ 6,500	\$ 737
1985	3,750	3,746	7,098
1986	2,973	2,977	3,999
1987	3,122 ^{a/}	3,122 ^{a/}	3,960
1988	517 ^{b/}	517 ^{b/}	831
1989	490	490	812
1990	399	399	314

3. Narrative:

(a) This project is for restoration, widening and improvement of portions of the roads at four sites - - Richland, INEL, ANL and LBL. Repair methods will vary from solely applying new asphalt covering to demolishing and reconstructing the road base and then resurfacing. In some cases, roads will also be widened, straightened or leveled to meet accepted standards for highway safety.

(b) This project is needed to bring site roads into conformance with current standards and practices in construction and traffic safety. Accident rates and severity due to poor pavement condition and geometries will decrease. Expensive annual road repairs due to deteriorated road base will be greatly reduced.

(c) \$399,000 is requested for FY 1990 funding. Construction will be completed this year.

^{a/} \$1,315,000 reprogrammed from prior year closed out projects.

^{b/} \$47,000 reprogrammed from prior year closed out projects.

DEPARTMENT OF ENERGY
FY 1990 CONGRESSIONAL BUDGET REQUEST
ENERGY SUPPLY RESEARCH AND DEVELOPMENT
(dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support
Environmental Compliance

IV. B. Plant Funded Construction Project

1. Project title and location: 90-R-770 General plant projects, Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee
- Project TEC: \$ 1,000
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	\$1,000	\$1,000	\$250
1991	\$0	\$0	\$750

3. Narrative:

- (a) This project provides for the many miscellaneous alterations, additions, modifications, replacements, and non-major new construction items.
- (b) These projects are required to reduce or eliminate environmentally harmful discharges from ORNL.

DEPARTMENT OF ENERGY
 FY 1990 CONGRESSIONAL BUDGET REQUEST
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support
 Environmental Compliance

IV. B. Plant Funded Construction Project

1. Project title and location: 88-R-830 Liquid Low-Level Waste Collection and Transfer System Upgrade
 Oak Ridge National Laboratory
 Oak Ridge, Tennessee
- Project TEC: \$35,000
 Start Date: FY 1988
 Completion Date: FY 1991

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 4,800	\$ 4,800	\$ 572
1989	11,787	11,787	8,100
1990	10,500	10,500	17,600
1991	7,913	7,913	8,728

3. Narrative:

- (a) This project will upgrade a portion of the existing Bethel Valley liquid low-level waste collection and transfer system. The project includes approximately one mile of doubly contained stainless steel piping and five stainless steel tanks (to be underground in stainless-steel lined concrete vaults). The pipelines will be equipped with an active leak detection and monitoring system and will be tied in with an overall operational central control system. The project will also include a new (4000 sq. ft.) central facility for receiving and discharging to the pipeline system liquid low-level waste which will be transported by truck in tanks and small bottles (in lieu of piping). Appropriately equipped new trucks will be provided to transport waste.

- (b) The purpose of this project is to upgrade a significant portion of liquid low-level waste collection and transfer system to protect personnel and public safety and health and the environment and to meet all applicable regulations. The majority of the existing system was constructed in the 1940's using materials and approaches considered applicable at the time. The original pipes are rapidly deteriorating and leaks are expected to occur at an increasing rate.
- (c) \$10,500,000 is requested for FY 1990 funding. This will be the third year of funding. Procurement and construction will be well underway.

Department of Energy
 FY 1990 OMB BUDGET SUBMISSION
 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:	Laboratory Wastewater Treatment Plant Improvements Argonne National Laboratory Argonne, Illinois	2. Project No. 90-R-119
3. Date A/E work initiated: 1st Quarter FY 1990		5. Previous Cost Estimate: None Date: N/A
3a. Date physical construction starts: 1st Quarter FY 1991		
4. Date construction ends: 4th Quarter FY 1992		6. Current Cost Estimate: \$6,640 Less amount for PE&D: <u>0</u> Net cost estimate: \$6,640 Date: Sept. 1988

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$6,640	\$ 500	\$ 500	\$ 500
1991	0	2,000	2,000	1,600
1992	0	4,140	4,140	4,540

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Laboratory Wastewater Treatment
Plant Improvements
Argonne National Laboratory
Argonne, Illinois

2. Project No. 90-R-119

8. Brief Physical Description of Project

Rehabilitation of the existing treatment facilities and additional works will be provided including independent physical, biological, chemical and radioactive waste treatment to obtain removals of BOD5, TSS, COD (Chemical Oxygen Demand), organic compounds and heavy metals, and radioactivity.

Existing equipment to be replaced includes flow metering and screening chambers, ion exchangers for radioactive waste removal, chemical feeders for pH adjustment, sludge pumps and piping, sludge scrapers, flow regulating valves and chambers for holding tanks and equalization pond liners. Major treatment process equipment areas to be provided include: flocculation settling, surface aeration, clarification, filtration, air stripping and carbon adsorption, chemical conditioning, sludge thickening and dewatering, flow monitoring, analytical laboratory and control, instrumentation and electrical, and radiation treatment.

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

Laboratory sewerage from building process and programmatic research-related drains is conveyed through the Laboratory sewer system to the sewage treatment plant (WWTP) at Facility 570. Here, wastes are treated prior to discharge of effluent to Sawmill Creek.

The existing WWTP has operated for nearly 35 years with most treatment components having reached their design life. The facility provides only influent flow equalization, chemical neutralization and primary sedimentation of sewerage. Inadequate facilities exist for treatment of radioactivity, biological and chemical deoxygenating wastes, organic compounds and metals. Also, the average wastewater flow rate to the WWTP is 33% greater than the average design flow rate; thus the treatment plant is hydraulically undersized. The emergency overflow pond for peak flow discharges is unlined and continued discharge to it could cause harm to the aquatic environment. The WWTP lacks equipment to neutralize influent alkaline wastes. As a result of these deficiencies, NPDES permit excursions have been reported to the IEPA and, thus, pose an environmental liability.

Implementation will ensure compliance with criteria imposed by the Illinois EPA and State Water Quality Standards. Upgrading the plant to handle the existing influent wastewater flow and chemical loads is necessary to avoid potential penalties and damaging publicity.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project:	Laboratory Wastewater Treatment Plant Improvements Argonne National Laboratory Argonne, Illinois	2. Project No. 90-R-119
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10. Details of Cost Estimate**

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ approximately 13% of construction, Item b		\$ 656
b. Construction costs**		5,117
(1) Site work.....	\$ 0	
(2) Buildings.....	0	
(3) Utilities.....	5,117	
	Subtotal.....	5,773
c. Contingency @ 15% above costs		867
	Total estimated cost.....	\$ 6,640

*Based upon current cost data. Cost escalation rate index for 1988 - 3.4%; 1989 - 4.3%; 1990 - 4.8%; 1991 - 5.0%; 1992 - 5.6%.

**For detailed cost breakdown see Appendix D of CDR.

11. Method of Performance

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

Department of Energy
FY 1990 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: December 1988

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$ 3,300	\$ 1,340	\$ 1,340	\$ 500
1991	0	1,960	1,960	1,100
1992	0	0	0	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.

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.

Department of Energy
FY 1990 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

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

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

5. Previous Cost Estimate: None
Date: None

6. Current Cost Estimate: \$ 3,700
Date: December 1988

<u>7. Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 3,700	\$ 500	\$ 500	\$ 220
	1991	0	2,200	2,200	1,510
	1992	0	1,000	1,000	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
-

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
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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 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
-

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

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CONSTRUCTION PROJECT DATA SHEET

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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
-

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
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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

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 1990 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: Hazardous waste management project
 Brookhaven National Laboratory
 Upton, New York

2. Project Number: 90-R-116

3. Date A-E Work Initiated: 2nd Qtr. FY 1990

3a. Date physical construction starts: 4th Qtr. FY 1991

4. Date Construction Ends: 4th Qtr. FY 1992

5. Previous Cost Estimate: \$ 2,840
 Date: September 1988

6. Current Cost Estimate: \$ 2,840
 Date: December 1988

<u>7. Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 2,840	\$ 160	\$ 160	\$ 130
	1991	0	2,680	2,680	1,250
	1992	0	0	0	1,460

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and Location of Project: Hazardous waste management project
Brookhaven National Laboratory
Upton, New York
2. Project Number: 90-R-116
-

8. Brief Physical Description (Continued)

The building will have five storage modules for the separation of incompatible chemicals. Each storage module will have a depressed floor slab provided with a spill contaminant curb around its perimeter and a holding/dilution sump pit. The facility will be provided with an automatic fire protection system; emergency shower and eyewash; heating, ventilating and air conditioning system provided with a charcoal filter; fume hood exhaust system exterior lighting, explosionproof interior and electrical lighting, power and fire alarm systems; and associated utilities.

Existing 25-35 year old underground piping systems convey liquid radioactive wastes from Building 750 to Building 801 where the waste is monitored and then to Building 811 where it is processed. At present there is no means of detecting leakage from these lines. The section of piping between Building 750 and 801 will be uncovered, inspected, repaired and leak sensors and alarms will be installed. Eight monitoring stations will be installed in the section between Building 801 and 811. Waste receiving facilities in Building 801 will be upgraded.

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

This project is part of a continuing effort to bring Brookhaven National Laboratory (BNL) into conformance with federal, state, and local environmental laws and regulatory requirements. The unique location of BNL over an EPA designated "sole-source" aquifer has heightened regulatory concern over potential groundwater contamination from BNL facilities.

Modifications and upgrades which will be accomplished under the scope of this project will eliminate several areas of non-conformance with Environmental Protection Agency (EPA, New York State Department of Environmental Conservation (NYSDEC), and Suffolk County Department of Health Services (SCDHS) regulations. The project covers work at two principal locations, the Hazardous Waste Management Facility and Waste Concentration Facility.

Work at the Hazardous Waste Management Facility (HWMF) consists of additional covered, curbed, impervious storage for staging of drums of hazardous wastes. The capacity of the existing facility has been exceeded and drums are stored outdoors on an asphalt pad without spill controls. EPA and SCDHS have noted this non-conforming practice on recent inspections.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Hazardous waste management project
 Brookhaven National Laboratory
 Upton, New York

2. Project Number: 90-R-116

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

The current hazardous (non-radioactive) chemical building violates provisions of EPA's Resource Conservation and Recovery Act (RCRA) regulations by not providing curbed storage which allows segregation of reactive chemicals. Capacity limits are also necessitating outdoor storage in violation of SCDHS regulations. Modifications and additional capacity are planned.

In the area of low-level radioactive (non-hazardous) waste the current practice of outdoor storing and staging of bulk materials is in violation of Department of Energy (DOE) regulations. Slightly radioactive corrosion products resulting from exposure of these materials to weather could leach into the groundwater. In addition to mitigating this problem, use of the new facility will facilitate substantial waste minimization activities since reusable components can be disassembled and salvaged.

The Waste Concentration Facility (WCF) receives radioactive wastes from Building 750 and Building 801. The wastes are conveyed by an underground piping system to storage tanks. A section of this system is over 35 years and leaks have been experienced in the tanks. Monitoring potential leaks from the "D" waste system, or conduit, removal and staging of one of the tanks, and other miscellaneous upgrades are planned.

10. Details of Cost Estimate ^{a/}

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at 15.4% of construction costs, item b		\$ 330
b. Construction Costs.....		2,140
1. Upgrade liquid waste handling area.....	\$ 350	
2. Bulk waste material handling/storage building.....	1,340	
3. Chemical handling and storage building.....	290	
4. Modify radioactive waste system.....	130	
5. Upgrade radioactive waste tank vaults.....	10	
6. Radioactive waste tank and piping removal.....	20	
	Subtotal....	<u>2,470</u>
c. Standard Equipment.....		<u>370</u>
	Total Estimated Cost....	<u>\$ 2,840</u> ^{b/}

^{a/} The above estimates are based on the Conceptual Design Report date December 1987.
^{b/} Escalation rates were taken from DOE Departmental Price Change Index - FY 1989 Guidance, August 1987 Update and were 4.1% (FY 1989), 4.8%, (FY 1990), 5.1% (FY 1991), and 5.6% (FY 1992).

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Hazardous waste management project
Brookhaven National Laboratory
Upton, New York

2. Project Number: 90-R-116

11. Method of Performance

Engineering, design and inspection shall be performed by the operating contractor. Construction and procurement shall be accomplished by fixed price contracts awarded on the basis of competitive bidding.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Laboratory and Sanitary Sewer Collection System Rehabilitation
Argonne National Laboratory
Argonne, Illinois
2. Project No. 90-R-115
-

8. Brief Physical Description of Project

A program for rehabilitation of all broken and leaking laboratory and sanitary sewers which serve permanent buildings and areas at ANL will be provided. Also, construction of new relief sewers where the capacity is insufficient is proposed. Approximately 14 miles of vitrified clay and cast iron pipe in the size range of 4 inches to 15 inches will be cleaned, televised and grouted. Approximately, 259 manhole structures and one (1) existing sewage pump station will be rehabilitated. Approximately, two (2) miles of broken or displaced sewer pipe will be replaced.

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

Many of the sewers have either collapsed due to bearing load capacity exceeded, infiltration/inflow (I/I) from leaky joints or direct storm water tie-in connections, or exhibited hydraulic-limiting flow characteristics from root intrusion and are undersized for future conditions.

During storm events, the sanitary and laboratory sewers have exhibited an increase in flow due to ground infiltration and direct inflow from roof leaders, area and storm sewer connections, foundation footing drains and cooling tower discharges. This increase in sewer flow has caused an increased burden on the wastewater treatment plant (WWTP) at Facility 570 and results in decreased treatment performance.

During dry weather conditions, the groundwater table on the site drops below the sewer invert elevations. With this condition, potentially contaminated radioactive wastewaters and contaminated toxic substances leak from the sewers into the surrounding soils through exfiltration. This can result in contamination of the Niagaran Dolomite Aquifer, the supply source of potable water for the Laboratory.

The Laboratory's laboratory and sanitary sewer collection system has an infiltration rate of over 6.0 gallons/minute per inch diameter per mile of pipe during wet weather. The Environmental Protection Agency allows 1500 gallons of infiltration per day per inch diameter per mile of pipe or 1.04 gpm/inch diameter/mile of pipe, thereby exceeding the allowable rate by over 4 times.

Department of Energy
FY 1990 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 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: \$2,200 Date: September 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: \$2,300 Date: December 1988
4. Date construction end: 4th Quarter FY 1991	

<u>7. Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	2,300	855	855	200
	1991	0	1,445	1,445	2,100

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
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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.

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 and 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.

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 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.

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.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Measurements and controls support facility
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee

2. Project No. 90-R-112

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.....		<u>3,780</u>
d. Contingency @ 17% of above costs.....		650
Total.....		<u>\$ 4,430</u>

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

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 1990 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: \$ 2,800
Date: September 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: December 1988 |
| 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	\$ 250	\$ 250	\$ 150
	1991	0	2,700	2,700	930
	1992	0	0	0	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

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- | | |
|---|--------------------------|
| 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 1990 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.)

- | | |
|---|---|
| <p>1. Title and location of project: Instrumentation Support Laboratory
Rehabilitation - Building 70A
Lawrence Berkeley Laboratory (LBL)
Berkeley, California</p> | <p>2. Project No.: 90-R-110</p> |
| <p>3. Date A-E work initiated: 2nd Qtr. FY 1990</p> | <p>5. Previous cost estimate: \$ 1,900
Date: September 1988</p> |
| <p>3a. Date physical construction starts: 3rd Qtr. FY 1991</p> | <p>6. Current cost estimate: \$ 2,000
Less amount for PE&D: 0
Net cost estimate: \$ 2,000
Date: December 1988</p> |
| <p>4. Date construction ends: 3rd Qtr. FY 1992</p> | |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 2,000	\$ 200	\$ 200	\$ 110
	1991	0	1,800	1,800	990
	1992	0	0	0	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
 Rehabilitation - Building 70A
 Lawrence Berkeley Laboratory (LBL)
 Berkeley, California

2. Project No.: 90-R-110

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 1990 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: Building addition
Brookhaven National Laboratory (BNL)
Upton, New York | 2. Project No. 90-R-109 |
| 3. Date A-E initiated: 1st Quarter FY 1990 | 5. Previous cost estimate: \$1,625
Date: September 1988 |
| 3a. Date physical construction starts: 3rd Quarter FY 1990 | 6. Current cost estimate: \$1,700
Less amount for PE&D: 0
Net cost estimate: \$1,700
Date: December 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	\$ 1,700	\$ 1,700	\$ 1,700	\$ 800
	1991	0	0	0	900

8. Brief Physical Description of Project

This proposal provides for a new two-story building and basement of approximately 12,500 gross sq. ft., a net area of about 9000 sq. ft. The building will house the Networking, Engineering, and Telecommunication Division of the Applied Mathematics Department. This proposal will meet only the most urgent of the spatial needs of the Applied Mathematical Department.

Sufficient land area is available to permit the design and construction of an energy efficient building without detrimental environmental impact or the interruption of existing activities. Top soil will be stripped, stored and spread when construction is complete. All access drives, walks, ramps, curbs, service and parking areas will be modified and extended. Trenching, relocation, extensions and connections to existing steam, condensate, power sanitary and storm sewers, alarm and telephone network have been included.

CONSTRUCTION PROJECT DATA SHEETS

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

2. Project No. 90-R-109

8. Brief Physical Description of Project (continued)

The new building will be non-combustible steel frame with concrete floors. All walls and roofs will meet or surpass energy conservation standards and glazed areas kept to a minimum. Sash throughout will be insulated, thermal break non-ferrous type. Vestibules will be incorporated into all entries. The building's design will be inherently energy conserving via its mass to exposed exterior surface ratio and constructed in accordance with Chapter 10, Part 101-20, 1/6-3 of the Federal Property Management Regulations. Generally, ceilings will be suspended acoustical grid type. Resilient tile floors will be placed in finished areas. Carpeting will be provided in acoustically sensitive areas.

All furniture, library stacks, conference/classroom equipment, etc., will be incorporated as required.

Electrical power of required voltage and current capacities will be distributed in accordance with code requirements. Lighting levels and equipment will be designed to meet the most recent energy conservation requirements and also to assure low maintenance costs.

The entire building will be heated and cooled via a central air handling system. Refrigeration for HVAC systems will be supplied from the Central Chilled Water Facility (scheduled to be completed by 1988). No mechanical environmental systems except ventilation and exhaust will be provided in unfinished areas, toilets and stairs. All environmental systems will be designed to meet current state-of-the-art techniques to minimize energy consumption, including day-of-opportunity 100% outside air system, variable volume distribution, waste heat recovery, and automatic day-night temperature setback and equipment shut-off control features where allowable. A sprinkler system will protect the new building. The system will be designed in accordance with DOE/FMEA No. 51-315-11 Fire Protection Review (12-1-74).

Security and fire alarm systems will be added to existing network and alarmed to Laboratory security and fire protection groups.

A tabulation and description of usable space for the proposed building addition follows:

CONSTRUCTION PROJECT DATA SHEETS

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

2. Project No. 90-R-109

8. Brief Physical Description of Project (continued)

<u>Space</u>	<u>(Area S.F.)</u>
Office space (23 offices and reception area)	3,000
Laboratory space	1,500
Training facility	1,000
Operator area	500
Storage space	1,000
Equipment space (special AC and underfloor cabling)	1,000
Library annex	300
Conference room	<u>300</u>
Total Functional Space	8,600

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

The present Applied Mathematics building was designed and built 20 years ago to meet the Department's research needs and the laboratory's central computing facility requirements as defined at that time. The building consists of an office wing and a computer wing. At present, temporary, leased modular building of 2900 s.f. and a trailer of 500 s.f. are connected to the building to provide additional space.

As stated in Section 8 above, this proposal addresses only the most urgent spatial requirements of the Department, which need to be met quickly.

The proposed building is to provide appropriate office, laboratory, operating, conference, library, training, and storage space for the Department's Networking, Engineering and Telecommunications Division and to alleviate some of the severe overcrowding and constraint-of-activities which exist in the existing building due to lack of sufficient office, conference, library, training, and storage space.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project:	Building addition Brookhaven National Laboratory (BNL) Upton, New York	2. Project No. 90-R-109
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9. Purpose, Justification of Need for, and Scope of Project (continued)

The Laboratory Director has assigned the Applied Mathematics Department the responsibility of unifying the diverse aspects of telecommunications at BNL. This was done in view of the increasingly close relationship between telecommunications and computing facilities, in terms of both technology and management trends within the DOE community. The Laboratory's communication needs, including, data, and video are expanding rapidly. Information transmission capability now profoundly affects the scientific, technical, administrative, and security aspects of the Laboratory.

The new management plan will create a unified operation by collecting human and material resources from various organizational units as necessary, and respond effectively to the Laboratory's needs and technical challenges involved. The scope of work for service and development aspects of communications include the following:

- voice, including administration of the vendor contracts and liaison with external common carriers
- data communication, including computer networking services
- video, including site wide security protection fiber optic links
- administration of the Laboratory's cable plant
- serving as a central focus for DOE mandated management and reporting functions, billing and inventory
- long range development planning

To accomplish these and related tasks, a Networking, Engineering and Telecommunications Division was organized within the Department. This Division consists of six groups: telephones, data communications, computer networks, digital engineering, long range planning and CAD/CAM. These functions are highly related and in many ways are symbiotic. Collectively they require close coordination of managerial and technical activities. They share technical facilities such as laboratories and instrumentation, as well as expertise. All have direct impact on one another and on the networking, engineering, and telecommunication activities of the Laboratory. This group initially consists of approximately 20 people, plus 5 on-site vendor personnel, but it is recognized to contain some of the functions most prone to growth because of technology trends. This means that the expansion of staff and equipment resources are expected to far outstrip the moderate growth seen for the Laboratory as a whole in the next five to ten years.

CONSTRUCTION PROJECT DATA SHEETS

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

2. Project No. 90-R-109

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

Adequate space is needed for the 20 professional staff including a reception area and conference space. Suitable training, library, conference and seminar space is also needed. There must also be a quiet room suitable for telephone operators. In addition, there must be an electronics laboratory for development and fabrication work, and a room for communications switching equipment; each of these have special requirements for electrical feeds, air conditioning loads, and outside cabling access. Space is needed to house vendor contractor facilities and personnel. Finally, provision must be made for storage space.

There is no space available in the existing building for housing additional activities and related personnel. A severe shortage of office space and office support facilities has existed in the Applied Mathematics Department building for a number of years. This resulted from new Departmental functions, increases in staffing, and the relocations of activities out of the computer wing into the office wing to make room for new computer equipment upgrades.

As more functions are moved out of the computer wing to make space for hardware and the Department staff expands, there will be no alternative but to seek additional temporary housing similar to the modular building and the trailer presently in use. Although these are economically and functionally far less advantageous than permanent space, such measures will be unavoidable.

10. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Architect/engineer, design and inspection at approximately 12% of construction costs, item b.....		\$ 138
b. Construction costs.....		1,370
(1) Improvements to land.....	\$ 6	
(2) New space construction (office, training, lab and equipment space) (12,500 s.f. @ \$99.50).....	1,358	
(3) Utilities including electrical power, water, steam and sanitary sewers.....	6	

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Building addition Brookhaven National Laboratory (BNL) Upton, New York	2. Project No. 90-R-109
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10. Details of Cost Estimate (continued)

	<u>Item Cost</u>	<u>Total Cost</u>
c. Standard equipment (includes office furniture, counters, shop benches, conference, library and class room furniture)...		_____ 37
Subtotal.....		\$ 1,545
d. Contingency @ approximately 12% of above costs.....		_____ 155
Total.....		\$ 1,700

*This estimate is an engineering estimate and is not based on a conceptual design. Conceptual Design has been initiated. Escalating rates for FYs 1987 up to FY 1990, the midpoint of construction, are respectively 3.1%, 4.2%, 4.9%, and 5.2%. Escalation rates conform to the guidelines prescribed in the Department of Energy's most recent Cost Methods Development Information Memorandum for Construction Projects dated August 1986.

11. Method of Performance

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

Department of Energy
FY 1990 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: \$1,600
 Date: September 1988

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

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 1,680	\$ 310	\$ 310	\$ 300
	1991	0	1,370	1,370	1,380

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 1990 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: 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: \$3,350
Date: September 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: December 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	\$ 324	\$ 324	\$ 200
	1991	0	3,196	3,196	770
	1992	0	0	0	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.

Department of Energy
FY 1990 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-106 |
| 3. Date A-E work initiated: 1st Qtr. FY 1990 | 5. Previous cost estimate: \$ 1,590
Date: September 1988 |
| 3a. Date physical construction starts: 4th Qtr. FY 1990 | 6. Current cost estimate: \$ 1,675
Less amount for PE&D: 0
Net cost estimate: \$ 1,675
Date: December 1988 |
| 4. Date construction ends: 2nd 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	\$ 1,675	\$ 150	\$ 150	\$ 150
	1991	0	1,000	1,000	1,000
	1992	0	525	525	525

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-106

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-106
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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.....	<u>\$1,675</u>

* 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.

12. Funding Schedule of Project Funding and Other Related Funding Requirements

Not required.

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

Not required.

14. Incorporation of Fallout Shelters in Future Federal Buildings

No new buildings are planned under this project.

Department of Energy
 FY 1990 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: 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: \$ 3,890
Date: September 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: December 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	\$ 350	\$ 350	\$ 150
	1991	0	1,400	1,400	1,470
	1992	0	2,350	2,350	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
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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.....		3,565
c. Contingency @ 15% of above costs.....		535
Total estimated project cost.....		\$4,100

* 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%.

DEPARTMENT OF ENERGY
FY 1990 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: Environmental upgrades
Brookhaven National Laboratory (BNL)
Upton, New York | 2. Project No. 89-R-113 |
| 3. Date A-E initiated: 2nd Qtr. FY 1989 | 5. Previous cost estimate: None
Date: None |
| 3a. Date physical construction starts: 1st Qtr. FY 1990 | 6. Current cost estimate: \$ 9,600
Less amount for PE&D: 0
Net cost estimate: \$ 9,600
Date: December 1988 |
| 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>
	1989	\$ 9,600	\$ 1,500	\$ 1,500	\$ 1,000
	1990	0	3,262	3,262	2,500
	1991	0	3,000	3,000	3,062
	1992	0	1,838	1,838	3,038

8. Brief Physical Description of Project

The aquifers beneath the Brookhaven site have been designated as "sole source of potable water" by New York State. To protect this vital resource from possible damage the Laboratory reviewed past and present operations and procedures which might adversely impact the ground water. It was concluded that there are several principal sources which could degrade the aquifers. The Laboratory has three disposal sites which have been used for shallow burial of hazardous wastes and a liquid waste processing facility with a tank containing radioactive sludge. This project will close the landfill sites and stabilize the potential leachate from these areas and will remove radioactive sludge as well as the holding tanks at the waste processing facility. To assure the viability of these actions and to continuously examine and sample the site air and water quality, it is necessary to upgrade and expand environmental monitoring capabilities.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Environmental upgrades Brookhaven National Laboratory (BNL) Upton, New York	2. Project No. 89-R-113
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8. Brief Physical Description of Project (continued)

Formal closure will be provided for the current landfill and the former landfill/chemical hole area. New York State Department of Environmental Conservation regulations require the closing of unlined land disposal facilities in specific areas of Nassau and Suffolk Counties in an effort to minimize potential degradation of the underlying ground water. Both areas are to be closed by capping with a relatively impervious liner. The cap functions in the minimization of liquid infiltration and leachate formation, promotion of drainage to catch basins and the reduction of erosion. In addition, the third site which is known to have received incinerator wastes is to be remediated by in-situ stabilization with a similar capping regimen. This project also provides for the packaging, transportation and off-site disposal of those radioactive materials which are currently stored above ground at the former landfill area. The successful execution of this project assumes as its design basis that in-situ stabilization of the buried contents of these sites will be adequate to mitigate potential environmental impacts.

Decontamination, dismantlement, and disposal will be conducted on three 100,000 gallon above ground tanks located at the radioactive liquid waste concentration facility. This project phase consists of removal of plutonium bearing sludge from one tank, dismantlement of all three tanks, associated piping and concrete pads, packaging, transportation and off-site disposal of all radioactive waste materials and restoration of the site. The previously processed sludge from two of those tanks which was packaged as part of an earlier effort will also be transported for off-site disposal as part of this project.

The environmental monitoring improvement phase of the project is designed to meet changing operational and regulatory needs. The project consists of reconstruction and upgrading of the nine existing monitoring stations as well as the erection of six new stations. In addition, those stations that are required to conduct effluent monitoring will require construction and installation of flow monitoring systems with appropriate sampling and data gathering capabilities.

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

Operations at Brookhaven National Laboratory have the potential to release a wide variety of pollutants which can have a significant impact on the environment. This is particularly so because of the "sole source aquifer" underlying the site. Therefore, it is imperative that the Laboratory take action to prevent, control, and abate environmental pollution.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Environmental upgrades Brookhaven National Laboratory (BNL) Upton, New York	2. Project No. 89-R-113
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9. Purpose, Justification of Need for, and Scope of Project (continued)

Past research, development, and waste management activities at BNL have resulted in several areas where low-level radioactive and/or hazardous wastes have been disposed. Such areas include the current landfill, ashfill, and the former landfill area which includes two dumping areas and the chemical and glass pits. Monitoring and control of these areas has been a continuing responsibility of the Laboratory to ensure that off-site releases are maintained within applicable environmental legislation has been enacted at both the state and federal levels in an attempt to provide appropriate controls over the remediation of contaminated sites. In keeping with the Department of Energy policy of controlling the potential hazards associated with operation of its facilities, specific site remediations are necessary at these areas to ensure adequate environmental protection. The designation of the aquifer underlying the Brookhaven National Laboratory site as a sole source of drinking water imposes strict requirements regarding hazardous waste disposal and site remediation. The project will provide for removal and off-site disposal of nonburied materials at the former landfill area and all aspects of closure required to environmentally stabilize the contents of the disposal sites.

In an effort to eliminate a major occupational and environmental hazard, the three 100,000 gallon above ground tanks which contained or currently contain radioactive sludge must be decontaminated, disassembled, and removed. Two of the 38 year old tanks have had leaks which have been temporarily patched. Though presently not a serious routine exposure hazard to Laboratory personnel, the lack of adequate containment for this sludge poses a major potential for accidental releases which are capable of significantly contaminating the surrounding soil, underlying ground water and/or the Peconic River. Furthermore, once the material deposited on the soil is dried it is then extremely mobile and can easily contaminate the air both on and off site. This project will cover all the work required to remove the sludge and tank structures to an off-site location as well as efforts to restore the site to it original condition.

In order to adequately assess the effectiveness of efforts to mitigate potential environmental impacts it is important that Brookhaven National Laboratory's air and water monitoring capability be upgraded. The field stations currently in use are more than twenty years old and are inadequate in number; susceptible to vandalism; and utilities are not available to support monitoring equipment. In addition, systems must be installed at ground water recharge and effluent discharge points to provide sampling and flow measurement capability. These facilities are required to assess the impacts associated with the possible release of pollutants at these points.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Environmental upgrades Brookhaven National Laboratory (BNL) Upton, New York	2. Project No. 89-R-113
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10. Details of Cost Estimates*

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design, inspection, quality assurance, and safety management at 16% of upgrade costs.....		\$ 1,152
b. Upgrade costs.....		7,200
Waste site closure.....	\$4,895	
Sludge tank disposition.....	1,930	
Environmental monitoring upgrade.....	375	
Subtotal.....		8,352
c. Contingency on the above costs @ approximately 15%.....		1,248
Total Estimated Cost.....		\$ 9,600

*The estimates are based on Conceptual Design Reports and 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 most recent DRI Index for Construction Projects dated August 1986. Escalation rates for FY 87, 88, 89, 90, and 91, through the midpoint of construction are respectively, 3.1%, 4.2%, 4.9%, 5.2%, and 5.4%.

11. Method of Performance

Design, engineering, major procurement, construction, inspection and project administration will be accomplished by the operating contractor (BNL) either in-house or by contracting with local 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.

Department of Energy
 FY 1990 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: Replace PCB Filled Transformers
Argonne National Laboratory (ANL)
Argonne, Illinois | 2. Project No.: 89-R-112 |
| 3. Date A-E work initiated: 1st Qtr. FY 1989 | 5. Previous cost estimate: None
Date: |
| 3a. Date physical construction starts: 3rd Qtr. FY 1989 | 6. Current cost estimate: \$ 2,380
Less amount for PE&D: 0
Net cost estimate: \$ 2,380
Date: December 1988 |
| 4. Date construction ends: 4th Qtr. FY 1990 | |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1989	\$ 2,380	\$ 1,000	\$ 1,000	\$ 600
	1990	0	1,380	1,380	1,780

8. Brief Physical Description of Project

This project will provide for the replacement of 26 PCB transformers at Argonne National Laboratory - East in accordance with an EPA ruling and the low-voltage switchgear associated with one of the transformers. These transformers will be replaced with low fire point liquid-filled units. All contaminated PCB units removed will be disposed of in strict accordance with the latest EPA ruling. The switchgear will be the outdoor walk-in low-voltage drawout type.

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

The EPA has taken an uncompromising position to PCBs. PCBs are extremely stable compounds which are soluble in the human body and accumulate in human tissue. They are highly suspect in the cause of human cancer.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Replace PCB Filled Transformers
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 89-R-112

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

In 1976, Congress passed the Toxic Substances Control Act (TSCA) and specifically directed the EPA to regulate polychlorinated biphenyls (PCBs). While other provisions to TSCA direct EPA to regulate chemicals that present an "unreasonable risk of injury to health and the environment." Section 6(e) is the only provision of TSCA that directly controls the manufacture, processing, distribution in commerce, use and disposal of specific chemical substances, PCBs.

As a result of this legislation the EPA has issued a series of rules and regulations which deal with elimination of PCBs from the environment. The most recent ruling dated July 17, 1985, has mandated that PCB Transformers rated at higher secondary voltages (480 volts and above) in commercial buildings must be phased out of service before October 1, 1990. DOE has classified the majority of Laboratory Facilities as commercial buildings.

The EPA has also announced on July 17, 1985, that fires involving PCB Transformers, particularly fires which occur in or near buildings, do present risks to human health and the environment. This determination was reached after considering the extreme toxicity of materials which can be formed and released during fires involving these transformers.

Some of the PCB Transformers at the laboratory are of World War II vintage (40 plus years old) and are very unreliable. Rehabilitation work on these aging transformers has become necessary because of an increasing number of repair and maintenance incidents. Most utilities and large industrial users write off the value of transformers after 25 years. Increased reliability and efficiency would be gained by using transformers of a more modern design.

The maintenance of transformers containing PCB dielectric fluid has presented many problems. Chief among these is the problem of replacement of sealing gaskets. Many of these gaskets have been replaced repeatedly because they have failed to seal the transformer coolant system properly. This has resulted in high maintenance and increased potential safety hazards to laboratory personnel.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Replace PCB Filled Transformers
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 89-R-112

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

Maintenance and repair of the switchgear has become increasingly more frequent resulting in excessive downtime. The switchgear is not the drawout breaker type. The breakers cannot be serviced without taking the switchgear out of service. This has impacted scientific work schedules.

The replacement of the switchgear which is not contaminated with PCB dielectric fluid must be done concurrently with its associated transformer because of limited accessibility to the work area in the future.

10. Details of Cost Estimate *

Total Cost

a. Engineering, design and inspection @ approx 10% of b.....	\$ 176
b. Construction.....	1,753
c. Contingency @ approx. 24%** of above costs.....	451
Total estimated project cost.....	<u>\$2,380</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%.

** The contingency for the project consists of 15% for Engineering and Construction (excluding handling of PCB contaminated equipment) and 40% to cover the uncertainties associated with the handling of PCB contaminated equipment. Inflationary demand for PCB Transformer removal and disposal services is expected to be significantly higher than projected.

11. Method of Performance

Title I and Title III engineering work will be performed by Laboratory personnel.

Procurement and installation of new transformers and the removal and disposal of PCB Transformers will be accomplished by fixed price design-build contract awarded on the basis of competitive bidding.

Department of Energy
 FY 1990 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: Building Utilities, Phase I
 Pacific Northwest Laboratory, (PNL)
 Richland, Washington

2. Project No.: 89-R-111

3. Date A-E work initiated: 2nd Qtr. FY 1989

3a. Date physical construction starts: 1st Qtr. FY 1990

4. Date construction ends: 2nd Qtr. FY 1991

5. Previous cost estimate: None
 Date:

6. Current cost estimate: \$ 3,000
 Less amount for PE&D: 0
 Net cost estimate: \$ 3,000
 Date: December 1988

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1989	\$ 3,000	\$ 600	\$ 600	\$ 600
	1990	0	2,168	2,168	2,168
	1991	0	232	232	232

8. Brief Physical Description of Project

This project provides for renovations to existing multiprogram laboratory facilities to correct deficiencies of miscellaneous multiprogram facilities systems, while meeting current standards of health, safety, security, and energy conservation and, at the same time, extending the useful life of the buildings.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Building Utilities, Phase I
Pacific Northwest Laboratory (PNL)
Richland, Washington
2. Project No.: 89-R-111
-

8. Brief Physical Description of Project (continued)

The project will rehabilitate and upgrade portions of mechanical, electrical, utility, and building systems in 305B, 306, 314, 314B, 318, 320, 324, 325, and the 3760 Buildings to improve their efficiency and operation. A chemical storage room of approximately 200 ft² with separate exhaust will be constructed inside the existing 306 Building. The 324 and 325 Building's breathing air systems will be upgraded. The 305B Building sewer sump basin will be enlarged and a second lift pump installed. The 314 Building will have two unused roll-up doors removed to reduce air infiltration; the gas bottle storage area enlarged; an existing autoclave pit will be removed to reclaim floor space; and automatic water deionizer will replace the existing system to improve water quality; and electrical feeders will be rerouted directly to the switchgear to improve the electrical distribution system. The 314B Building will have the existing roof blowout panels replaced with more reliable pressure relief panels and the incandescent lighting fixtures will be replaced with fluorescent fixtures to improve lighting and efficiency. The 320 Building loading dock will be enlarged to improve safety; plaster walls in the stair wells will be refinished; moisture damaged acoustical ceiling tiles in portions of the main floor corridors will be replaced; rust moisture affecting building systems and corroded elements will be modified or replaced to improve their efficiency and improve operational reliability; a permanent isokinetic probe will be provided in the stack monitoring system; an existing 30 gallon distilled water storage tank will be replaced with a new larger capacity tank; and additional 480 volt panel will be added in the vicinity of the existing motor control center; weatherproof 120 and 208 VAC receptacles will be installed on the existing loading dock; fire protection sprinkler heads will be extended to provide coverage for the loading dock extension; recessed light fixtures in the lobby will be replaced with fluorescent light fixtures since the lobby is now used as a secretarial station; and a new control system will be installed for the building HVAC system. The 3760 Building will have the incandescent lighting fixtures in the reading room replaced with energy efficient fluorescent lighting fixtures. The FY 1989 budget request will be used to fund the definitive design and construction of this project.

CONSTRUCTION PROJECT DATA SHEETS

-
1. Title and location of project: Building Utilities, Phase I
Pacific Northwest Laboratory (PNL)
Richland, Washington
2. Project No.: 89-R-111
-

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

The primary reason for this project is to renovate and extend the useful life of major DOE multiprogrammatic facilities which are critical to the DOE mission at Hanford, and promote safe and efficient operations. This project is necessary to reverse the accelerating damage being inflicted on existing facilities and their building systems and to keep these structures and building service systems from deteriorating further.

Portions of the mechanical, electrical, utility, and building systems in 305B, 306, 314, 314B 318, 320, 324, 325, and the 3760 Buildings need to be rehabilitated. Their rehabilitation will improve the system efficiency and operation. A chemical storage room of approximately 200 ft² needs to be added inside the 306 Building. The 324 and 325 Building's breathing air systems need to be upgraded. The 305B Building sewer sump basin needs to be improved to increase the systems reliability. The 314 Building needs two unused roll-up doors removed to reduce energy loss caused by air infiltration; an unused autoclave pit needs to be removed to reclaim floor space; the existing deionized water system needs to be replaced to improve water quality; additional gas bottle storage capacity is needed; and electrical distribution system needs to be upgraded to improve efficiency. The 314B Building needs to have the distorted and unreliable, pressure relief, roof blowout panels replaced and the light fixtures upgraded to improve light levels efficiency. The 320 Building needs to have the loading dock enlarged to reduce congestion and risk of accidents; plaster walls in the stair wells need to be refinished due to moisture damage; acoustic ceiling tiles in portions of the main floor corridors need to be replaced for the same reason; and rust needs to be removed from the building structural, HVAC, lighting, and piping systems. The 3760 building lighting in the reading rooms needs to be upgraded to improve light levels and efficiency. A delay in funding or not authorizing this project will have the following effects: (1) the subject facilities will continue to be high consumers of non-renewable energy resources; (2) a major amount of materials testing work will be restricted or not able to be performed safely and efficiently; and (3) increased operating cost will result from probable failure of deteriorated building systems. These buildings are currently in marginal compliance with codes and this project will improve code compliance.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Building Utilities, Phase I
Pacific Northwest Laboratory (PNL)
Richland, Washington

2. Project No.: 89-R-111

10. Details of Cost Estimate

<u>Item</u>	<u>Item Costs</u>	<u>Total Costs^{a/}</u>
a. Engineering, design, and inspection at approximately 21% ^{b/} of items c and d below.....	\$ 0	\$ 400
b. Land and land rights (none, the facility will be built on government land).....		0
c. Construction costs:		2,000
1. Improvements to land (site work).....	40	
2. Buildings (none, building renovations only).....	1,960	
3. Utilities (including water, electrical power, and sewer).....	0	
d. Standard equipment.....		0
Subtotal ^{c/}		<u>2,400</u>
e. Contingency at approximately 25% of all above costs.....		<u>600</u>
Total Estimate Project Cost.....		<u><u>\$3,000</u></u>

^{a/} Based on completed conceptual design.

^{b/} The high, relative percentage of engineering is for renovation work being done in nine separate buildings.

^{c/} Includes escalation at the rates of 2.6% (1987), 4.4% (1988), and 4.3% (1989), and 4.3% (1990) to midpoint of construction with rates based on the December 1986 Hanford Materials and Labor Escalation Study.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Building Utilities, Phase I
Pacific Northwest Laboratory (PNL)
Richland, Washington

2. Project No.: 89-R-111

II. Method of Performance

Design and inspection of building rehabilitation work in laboratories will be performed by the onsite architect-engineer. Construction and procurement will be accomplished by fixed price contracts awarded on the basis of competitive bidding.

Department of Energy
FY 1990 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: Road safety improvements
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee | 2. Project No. 89-R-108 |
| 3. Date A-E initiated: 1st Quarter FY 1989 | 5. Previous cost estimate: None
Date: none |
| 3a. Date physical construction starts: 4th Quarter FY 1989 | 6. Current cost estimate: \$2,520
Less amount for PE&D: 0
Net cost estimate: \$2,520
Date: December 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>
	1989	\$ 2,520	\$ 1,650	\$ 1,650	\$ 400
	1990	0	870	870	1,400
	1991	0	0	0	720

8. Brief Physical Description of Project

This project will involve a partial reconstruction of Bethel Valley Road which is the primary access road to the Oak Ridge National Laboratory. The improvements will include modification of key road intersections, installation of sensor-controlled traffic signals, and modification of adjacent parking lots.

The required work will include earthwork (grading, fill, and compaction), paving of the roads and parking areas, and installation of traffic signals and improved lighting. The attendant requirements for relocation and modification of utilities, fencing, guard portals, drainage, pavement markings, curbing, and pedestrian walkways will also be provided.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Road safety improvements Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee	2. Project No. 89-R-108
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9. Purpose, Justification of Need for, and Scope of Project

The project will mitigate significant deficiencies in safety, function, and capacity by rebuilding, replacing, and adding to the selected roads, traffic controls systems, and parking areas.

Bethel Valley Road was originally constructed for rural travel at low speeds and very light traffic loads. The existing roadway exhibits extremely short line-of-sight distances (200 ft. versus the 450 ft. reaction time to stopping as recommended by the American Association of State Highway and Transportation Officials (AASHTO) design standards) at several points where pedestrians or vehicles cross the road. The road is open to the public, and is heavily used. The average vehicle speed is 50-55 mph versus the AASHTO recommended speed of 25-30 mph. Several accidents have been recorded including overturned and burned vehicles, collisions, and shifted loads on commercial equipment/materials carriers. Near-miss incidents are common. The potential for a catastrophic accident, involving loss of life, is high.

The inability to meet current highway standards and the resultant potential liability to the DOE, indicates that these road and parking areas be rehabilitated. This project is consistent with the concept of progressive safety improvement and the long-range plan of the laboratory.

Portions of the roadway will be modified to improve the line-of-sight distance. New sensor-controlled traffic signals will be installed for improved traffic control.

The intersections of the roadway and parking entries and exits will be modified to clarify turning options. Pedestrian drop-off points will be made more visible and accessible. Selected parking areas will be modified as required to minimize pedestrian crossing of the Bethel Valley roadway and to alleviate overcrowding.

If this project is not funded, the existing road and parking areas will remain in operation under the current unsafe conditions. The line-of-sight distances will remain too short to provide for adequate reaction time to stopping. Vehicle turning options at intersections will continue to be unclear. Overcrowding due to the shortage of parking will continue to contribute to the potential for accidents. The alternative of performing this work in a series of general plant projects has been assessed, but is not considered viable because of the coordination needed at the road and parking intersections. Integrated road modifications with parking changes in one line item level project is a safer and more cost effective approach.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Road safety improvements Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee	2. Project No. 89-R-108
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9. Purpose, Justification of Need for, and Scope of Project (continued)

Implementation of the proposed improvements will not significantly alter the annual maintenance costs for the roadway system and parking areas. The expected life of the roads and parking areas after rehabilitation and with maintenance is 25 years.

10. Details of Cost Estimate*

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at approximately 15% of construction costs, item b.....		\$ 290
b. Construction costs.....		1,930
(1) Improvements to land.....	\$1,930	
Subtotal.....		<u>\$ 2,220</u>
c. Contingency @ 15% of above costs.....		300
Total.....		<u>\$ 2,520</u>

*The cost estimate is based on a completed conceptual design report, issued in January 1987, at a cost of \$150,000.

11. Method of Performance

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

Department of Energy
FY 1990 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: Fire protection improvements (Phase III)
Brookhaven National Laboratory (BNL)
Upton, New York | 2. Project No. 89-R-102 |
| 3. Date A-E initiated: 2nd Quarter FY 1989 | 5. Previous cost estimate: None
Date: none |
| 3a. Date physical construction starts: 1st Quarter FY 1990 | 6. Current cost estimate: \$3,000
Less amount for PE&D: 0
Net cost estimate: \$3,000
Date: December 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>
	1989	\$ 3,000	\$ 645	\$ 645	\$ 150
	1990	0	2,355	2,355	800
	1991	0	0	0	1,500
	1992	0	0	0	550

8. Brief Physical Description of Project

This project provides for the design, fabrication and installation of various fire protection improvements consisting of providing automatic sprinkler protection in facilities designated as high loss potential listed below:

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Fire protection improvements (Phase III)
Brookhaven National Laboratory (BNL)
Upton, New York

2. Project No. 89-R-102

8. Brief Physical Description of Project (continued)

<u>Building No.</u>	<u>Title</u>	<u>Extent of Sprinkler Protection</u>
50	Police Headquarters	Attic & Crawl/Occupied Areas
51	Meteorology	Occupied Areas/Attic Crawl Space
97	Record Storage	Occupied Areas
120M	Department of Applied Science	Modular Addition
129	Department of Nuclear Energy/ Safety & Environmental Protection Division	Occupied Areas
184	Library Annex	Occupied Areas
244	Carpenter & Paint Shops	Occupied Areas
321	Site Maintenance Shops	Occupied Areas
326	Site Maintenance Shops	Occupied Areas
339	Site Maintenance Shops	Occupied Areas
348	Calibrations	Occupied Areas
412	Site Maintenance Storage	Occupied Areas
422	Building Maintenance Service	Occupied Areas
460	Director's Office	Occupied Areas
462	Light Machine Shop	Occupied Areas
464	Department of Energy	Occupied Areas
477	Library	Occupied Areas
479	Heavy Machine Shop	Occupied Areas
488	Cafeteria	Basement & Storage
526	Department of Applied Science	Basement
902	High Energy Facility	Offices (Exclude High Bay)
912 EEBA	Alternating Gradient Synchrotron Target Hill	Cable Tunnel & Work Shop
914	Old Linac	Entire
918	Alternating Gradient Synchrotron Warehouse	Entire
922	Alternating Gradient Synchrotron Assemble	Entire

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Fire protection improvements (Phase III) Brookhaven National Laboratory (BNL) Upton, New York	2. Project No. 89-R-102
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<u>Building No.</u>	<u>Title</u>	<u>Extent of Sprinkler Protection</u>
924	Alternating Gradient Synchrotron Magnet Assemble	Entire
926	Alternating Gradient Synchrotron Receiving & Storage	Entire
930	200 MEV Linac	Offices, Labs & Lower Gallery
935	High Energy Facilities Winding Facility	Entire
936	Alternating Gradient Synchrotron Storage	Entire

All installations and modifications will be in accordance with DOE recommended standards. Specifically, sprinkler protection will conform to National Fire Protection Association Standard 13. Sprinkler systems will be hydraulically designed to minimize costs. Wet pipe system on 100 s.f. spacing will be used in heated areas. Dry pipe system will be used for unheated or partially heated areas. Water supplies will be taken from the existing BNL site water distribution system.

In addition to fire suppression systems, various facilities will be modified to raise their level of fire protection to acceptable levels. The major focus of these modifications will be Brookhaven's Fuel Storage Facility, which contains over three million gallons of fuel. In addition, stairways will be provided for ladder type exits in Buildings 120, 129, and 462.

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

The purpose of this project is to reduce the risk of loss due to fire at BNL. In a 1984 Fire Protection Survey for DOE, Professional Loss Control, Inc., found that "... Brookhaven National Laboratory does not meet the 'Improved Risk' philosophy advocated in DOE 5480.1, Chapter VII, Fire Protection due to the lack of automatic fixed suppression systems (automatically sprinklers)..." For this project, only "key facilities" have been included. Key facilities are defined as:

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Fire protection improvements (Phase III)
 Brookhaven National Laboratory (BNL)
 Upton, New York

2. Project No. 89-R-102

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

- a. Building containing operations directly involved in DOE program activities; or
- b. Vital support buildings for program buildings.

Each key facility was examined in relation to several interrelated risk factors: potential dollar loss due to fire, effectiveness and reliability of existing fire protection (if any), amount of combustibles present, type of potential fire (i.e., smokey, flash, average), access by fire department, salvageability, potential extension of fire, impact on experiments, and life safety of occupants.

Providing additional sprinkler systems will bring BNL further into compliance with DOE Order 5840.1 on fire protection. The method of analysis for fire suppression differs from what was previously used for funding requests. The previous method relied on a ten year old study done by an external engineering/fire insurance firm (Factor Mutual Engineering Association). However, the areas that BNL and the 1984 Fire Protection Survey identified as most needing protection coincide with Factory Mutual's work and provide verification of a long standing need.

10. Details of Cost Estimates*

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at 12% of construction costs, item b.....		\$ 280
b. Construction costs.....		2,330
(1) New sprinkler systems in 30 buildings.....	\$1,670	
(2) 30 new water mains with trenching control valves and wet tap.....	125	
(3) 30 new or modified supervisory and alarm panel.....	350	
(4) Modify various buildings for life safety improvements.....	185	
Subtotal.....		2,610

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Fire protection improvements (Phase III)
 Brookhaven National Laboratory (BNL)
 Upton, New York

2. Project No. 89-R-102

10. Details of Cost Estimates* (continued)

	<u>Item Cost</u>	<u>Total Cost</u>
c. Contingency @ approximately 15% of above costs (item a & b)...		390
Total.....		\$ 3,000

*Estimate is based on a completed conceptual design report. All costs are escalated by 3.1% for FY 1987, 4.2% for FY 1988, 4.9 for FY 1989, 5.2% for FY 1990 and 5.4% for FY 1991. These rates conform to the DOE's Independent Cost Estimate Staff's guidelines for general construction issued with this budget call. The costs are adjusted to the midpoint of construction. The 15% contingency reflects design intangibles normally associated with retrofit work in BNL's environment (i.e., relocation of utilities, repair of building after installation).

11. Method of Performance

Design, engineering, major procurement, construction, inspection and project administration will be accomplished by the operating contractor (BNL) either in-house or by contracting with local 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.

Department of Energy
 FY 1990 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: Hazardous waste handling facility
Lawrence Berkeley Laboratory (LBL)
Berkeley, California | 2. Project No.: 88-R-812 |
| 3. Date A-E work initiated: 2nd Qtr. FY 1988 | 5. Previous cost estimate: None
Date: |
| 3a. Date physical construction starts: 4th Qtr. FY 1989 | 6. Current cost estimate: \$ 4,650
Less amount for PE&D: 0
Net cost estimate: \$ 4,650
Date: December 1988 |
| 4. Date construction ends: 1st 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	\$ 4,650	\$ 500	\$ 500	\$ 62
	1989	0	2,800	2,800	1,610
	1990	0	1,350	1,350	2,065
	1991	0	0	0	913

8. Brief Physical Description of Project

This project will provide a remote site for a badly needed hazardous waste handling facility including a specialized 12,300 gross square feet building and adjacent yard area.

The project will be located in upper Strawberry Canyon, north of the Buildings 74-83 Biosciences Complex. Construction will include an access road, site utilities, grading and paving of two yard areas, and a 12,300 GSF building for hazardous waste handling and storage. Yard lighting, fencing, storm drainage, and sanitary sewers will also be provided. To avoid costly imported fill, the project will utilize two on-site borrow areas. These areas will be graded and sealed to control erosion, and will serve as remote vehicle storage areas.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Hazardous waste handling facility
Lawrence Berkeley Laboratory (LBL)
Berkeley, California

2. Project No.: 88-R-812

8. Brief Physical Description of Project (continued)

The hazardous waste handling facility is sited in general conformance with the 1984 LBL Site Development Plan approved by the Department of Energy in FY 1984.

The new Government-owned facilities described herein will be located on leased land owned by the Regents of the University of California.

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

Many factors necessitate the relocation of the LBL hazardous waste handling facility. The existing facility was constructed as a temporary handling area with the expectation that a permanent facility would be constructed at a later date, in accordance with the LBL site plan. Currently, the facility handles diverse hazardous wastes including radioactive transuranic elements, toxic liquid chemicals such as PCB's, toxic gases such as phosphine and arsene, and flammable solvents. Handling and detoxifying these wastes always poses the potential for releases from accidental causes such as traffic accidents, fire, incomplete reactions or explosions.

In its current location, the facility is in close (350-500 feet) proximity to large laboratory (250 personnel) and non-laboratory (400 personnel) populations. Thus, relocating the handling facility to the proposed site would reduce potential exposure to personnel in the event of a release.

Additionally, the interim facility is located in a region that has been prone to landslides in the past. A recent Environmental Protection Agency (EPA) review identified the flammable materials storage area as requiring improvement. The facility relocation would alleviate the need for improvement.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Hazardous waste handling facility Lawrence Berkeley Laboratory (LBL) Berkeley, California	2. Project No.: 88-R-812
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10. Details of Cost Estimate *

	<u>Item Costs</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ about 17% of construction, Item b.....		\$ 565
b. Construction costs.....		3,310
(1) Improvements to land.....	\$1,415	
(2) Building: 12,300 Sq. ft. @ \$113/sq. ft.	1,390	
(3) Site utilities.....	505	
Mechanical.....	\$ 180	
Electrical.....	325	
Subtotal.....		3,875
c. Contingency @ 20% of above costs.....		775
Total estimated cost.....		\$4,650

* Conceptual design is complete.

11. Method of Performance

Engineering, design and inspection 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. Minor construction work may be done using LBL forces. At the time of scoping construction and procurement, specific parts of the project will be set aside for Small Business Administration (SBA) 8A subcontracts. Candidate items are landscaping, hydroseeding, furnishings, and specialty items.

Department of Energy
FY 1990 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: December 1988 |
| 4. Date construction ends: 4th Qtr. FY 1991 | |

<u>7. 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	1,150
	1990	0	3,000	3,000	2,990
	1991	0	560	560	873

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 2. Project No.: 88-R-807
Argonne National Laboratory (ANL)
Argonne, Illinois

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

II. 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 1990 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: 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 | 5. Previous cost estimate: None
Date: |
| 3a. Date physical construction starts: 4th Qtr. FY 1988 | 6. Current cost estimate: \$10,325
Less amount for PE&D: 0
Net cost estimate: \$10,325
Date: December 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	\$10,325	\$ 850	\$ 850	\$ 59
	1989	0	3,003	3,003	3,284
	1990	0	4,837	4,837	3,038
	1991	0	1,635	1,635	3,944

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.

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

Hillside 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
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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.....		8,604
e. Contingency at about 20% (of which \$780 is for building construction).....		1,721
Total estimated cost.....		\$10,325

* 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 1990 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: Environmental improvements
Brookhaven National Laboratory (BNL)
Upton, New York | 2. Project No.: 88-R-805 |
| 3. Date A-E work initiated: 2nd Qtr. FY 1988 | 5. Previous cost estimate: None
Date: none |
| 3a. Date physical construction starts: 4th Qtr. FY 1988 | 6. Current cost estimate: \$ 4,000
Less amount for PE&D: 0
Net cost estimate: \$ 4,000
Date: December 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	\$4,000	\$ 565	\$ 565	\$ 10
	1989	0	1,946	1,946	1,800
	1990	0	1,489	1,489	1,000
	1991	0	0	0	1,190

8. Brief Physical Description of Project

Four (4) buildings will have asbestos insulation removed from duct, piping, and equipment. These buildings are Biology (463), Hot Laboratory (801), Magnetic Fusion (820A), and Beam Components Building (914). This project supports the present Laboratory program to upgrade and correct potential environmental problems. Twelve buildings presently served by cesspools will be connected to the central sanitary sewage system. These buildings are Telephone Equipment Building (449), Mechanical/Electrical Maintenance Shop (452), Water Treatment Plant (624), Cryogenic Test Facility (904), Assembly Building (905), Works Buildings (919A & 919B), Receiving/Warehouse (926), Assembly/Storage (935), On Line Data Facility (940) and Production Holding Facility (945) with adjacent trailer (122).

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Environmental improvements Brookhaven National Laboratory (BNL) Upton, New York	2. Project No.: 88-R-805
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9. Purpose, Justification of Need for, and Scope of Project

Asbestos removal is the only certain way to ensure that BNL's facilities meet Occupational Safety and Health Act (OSHA) and Environmental Protection Agency (EPA) requirements, to provide a safe working environment, and to avoid possible future liability considerations. The Laboratory is situated over Long Island's sole source ground water aquifer. To continue the use of cesspools as a means of waste disposal, which includes both sewage and laboratory wastes from these buildings, is not prudent and is highly questionable in light of the latest EPA Drinking Water Act. Under present regulations, continuous sampling, monitoring, and analyses are required with permits and associated fees anticipated in the near future. There also exists the future possibility of forced shutdowns of these facilities by the State of New York's Department of Environmental Conservation (DEC).

The four buildings presently containing asbestos insulation will have this insulation removed and disposed of in a safe and environmentally approved area in accordance with local and federal codes. Piping, ductwork, and vessels will be re-insulated to meet the latest DOE requirements for energy conservation.

The 12 buildings presently served by cesspools will be connected to the central sanitary sewage system. New lift stations will be required in most cases to transport the sewage to the nearest sanitary manhole. The abandoned cesspools will be evacuated, if necessary, and filled in with sand in accordance with local and federal codes.

10. Details of Cost Estimate*

	<u>Item Cost</u>	<u>Total Cost</u>
a. Architect-Engineer, design and inspection at approximately 12% of construction costs, item b.		\$ 388
b. Construction costs.....		3,231
(1) Cesspool abandonment and connection to sanitary system.....	\$ 409	
(2) Asbestos removal and re-insulation of equipment.....	2,822	
Subtotal.....		3,619
c. Contingency on the above costs @ approximately 11%.....		381
Total estimated cost.....		\$4,000

*The estimates are based on a completed conceptual design report.

CONSTRUCTION PROJECT DATA SHEETS

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

2. Project No.: 88-R-805

11. Method of Performance

Design, engineering, major procurement, construction, inspection and program administration will be accomplished by the operating contractor (BNL) either in-house or 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.

Department of Energy
 FY 1990 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: Water line replacement Argonne National Laboratory (ANL) Argonne, Illinois	2. Project No.: 87-R-756
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: \$ 5,200 Less amount for PE&D: 0 Net cost estimate: \$ 5,200 Date: December 1988
4. Date construction ends: 4th Qtr. FY 1990	

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1987	\$ 5,200	\$ 566	\$ 566	\$ 138
	1988	0	1,537 ^{a/}	1,537 ^{a/}	674
	1989	0	2,560	2,560	2,000
	1990	0	537	537	2,388

8. Brief Physical Description of Project

This project will rehabilitate all of the deteriorated water lines which serve permanent buildings and areas at Argonne National Laboratory (ANL). Approximately 18 miles of cast iron water line in the size range of 2 inches to 18 inches will be replaced. The new water lines will consist of polyvinyl chloride (PVC) and reinforced concrete pipe (RCP) approved for potable water distribution and cast iron valves and fittings with cathodic protection.

^{a/}\$37,000 reprogrammed from prior year closed out projects.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Water line replacement
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 87-R-756

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

This project is proposed because the water lines at ANL will become unreliable for fire protection use and Laboratory operations by 1990. Replacement of the water line will restore the reliability necessary for fire safety and efficient Laboratory operations.

Due to soil-side corrosion and graphitization of the cast iron pipe (determined by metallographic analysis), the water lines have reached the end of their useful life in most sections. The water lines will experience pipe breaks at an increasing rate as they age and are subjected to changes in stress caused by temperature changes or nearby excavation. The high frequency of pipe breaks will result in water supply outages to major buildings for two reasons: 1) increased number of simultaneous pipe breaks so that buildings with water supply from two directions in the grid will have both supplies cut off; 2) the cast iron pipe has become so weak that it cannot be repaired with a sleeve and replacement of an entire section typically requires one week.

The history of pipe breaks of the potable water system at ANL was analyzed by a corrosion consultant, C. P. Dillion and Associates, in 1979. The frequency of pipe breaks follow a semilogarithmic curve typical of corrosion and aging in cast iron pipe. Over 100 pipe breaks per year are projected to occur in 1986 and beyond. Projections to 1983 have proven accurate. By 1990 the fire distribution system will not supply water reliably for fire protection use.

The Laboratory has three water distribution systems: a) domestic/fire (14.8 miles), b) laboratory (3.3 miles), c) canal (5.5 miles). The majority of the domestic/fire and laboratory water lines were installed in 1950; the canal water lines were installed in 1963. Since the laboratory and canal water lines run parallel to the fire/domestic lines in most areas, replacing all three lines simultaneously is economical. Although the canal lines are only 20 years old, they have become heavily scaled and no longer deliver the rated volume of water. During the summer, several buildings are not supplied with sufficient cooling water requiring supplemental feed from the domestic/fire system. In 1980, acid cleaning of the canal lines was investigated by a commercial firm; acid cleaning on a test sample failed to remove the scale safely. Replacement of the canal lines will return the canal system to its rated capacity. Since 1983, the canal water treatment has been modified so that in the future treatment water will no longer scale the lines.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Water line replacement
 Argonne National Laboratory (ANL)
 Argonne, Illinois

2. Project No.: 87-R-756

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

Scope of Project: This project will replace 11.1 miles of domestic/fire, 2.9 miles of laboratory and 4.4 miles of canal water lines. The remaining portions of the existing water lines either serve buildings planned for demolition or will have been rehabilitated with funding currently in the Fire Safety Improvements Line Item.

Alternatives to cast iron pipe were investigated. PVC pipe was chosen for its low cost and high corrosion resistance. The new PVC pipe will withstand the corrosiveness of the soil. Cast iron valves and fittings will be provided with sacrificial anodes for cathodic protection. This project will reduce the frequency of water line breaks due to the deteriorated cast iron pipe. The beneficial results are: a) reliability of fire protection water for property and life safety and b) reliability of laboratory and canal water distribution for Laboratory programs.

10. Details of Cost Estimate*:

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design, and inspection at 13% of construction costs, item b.....		\$ 530
b. Construction costs.....		4,180
(1) Site work.....	0	
(2) Buildings.....	0	
(3) Utilities.....	\$ 4,180	
Subtotal.....		\$ 4,710
c. Contingency at 10% above costs.....		490
Total estimated costs.....		\$ 5,200

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

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Water line replacement
Argonne National Laboratory (ANL)
Argonne, Illinois

2. Project No.: 87-R-756

11. Method of Performance

Engineering and design will be accomplished by an architect engineer under Laboratory supervision. Construction inspection will be accomplished by Laboratory personnel. Construction will be accomplished via lump-sum, competitively bid construction contract.

Department of Energy
 FY 1990 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 <u>\$12,035</u> Date: December 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/}	1,354
	1989	0	2,800	2,800	4,100
	1990	0	2,611	2,611	4,100
	1991	0	1,500	1,500	1,960

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

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

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.....	<u>\$ 12,035</u>

*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 1990 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: Road repair, various locations (ANL, INEL, LBL, RL) | 2. Project Number: 84-ER-103 |
| 3. Date A-E Work Initiated: 2nd Qtr. FY 1984 | 5. Previous Cost Estimate: \$16,000
Date: August 1982 |
| 3a. Date physical construction starts: 4th Qtr. FY 1984 | 6. Current Cost Estimate: \$17,751
Less amount of PE&D: <u>0</u>
Net Cost Estimate: <u>\$17,751</u>
Date: December 1988 |
| 4. Date Construction Ends: 4th Qtr. FY 1990 | |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1984	\$19,500 ^{a/}	\$6,500	\$6,500	\$ 737
	1985	0	3,750	3,746	7,098
	1986	0	2,973	2,977	3,999
	1987	0	3,122 ^{b/}	3,122 ^{b/}	3,960
	1988	0	517 ^{c/}	517 ^{c/}	831
	1989	0	490	490	812
	1990	0	399	399	314

8. Brief Physical Description of Project

This project is for the restoration, widening, and improvement of roads at various sites to improve traffic safety and bring these roads into conformance with current standards and practices in highway construction. Brief descriptions of each component, by site, follows:

^{a/} \$3,500,000 reprogrammed from 82-E-306 in FY 1984.

^{b/} \$1,315,000 reprogrammed from prior year closed out projects also at Idaho.

^{c/} \$46,000 reprogrammed from prior year closed out projects.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Road repair, various locations (ANL, INEL, LBL, RL) 2. Project Number: 84-ER-103

8. Brief Physical Description of Project (continued)

- a. Traffic Safety Improvements, Route 4, Richland, Washington - Approximately thirteen miles of Route 4, the arterial road servicing the Hanford area, will be improved to be more consistent with Washington State highway design guidelines. Each lane will be widened approximately 2 feet to provided standard 12-foot lanes. Shoulder surfaces will be treated and widened to provide the standard design width. Acceleration, deceleraton, and holding lanes will be provided where required.

Safety hazards such as poles, fire hydrants, and telephone cable boxes will be removed or relocated as required. Appropriate traffic control devices, lane markers, guard rails, roadway signs, pavement markings, and crash protection will be provided as necessary. Connecting service and frontage roads will be upgraded concurrently. The road shall be resurfaced with an asphalt overlay to eliminate the cracked and uneven places and to match and blend with the additions proposed by this project. The intended useful life of this project is 25 years.

- b. INEL Road Refurbishment, Idaho National Engineering Laboratory (INEL), Idaho - This project provides for restoring approximately 37 miles of INEL primary and secondary roads to a safe and reliable condition. The project design will provide an engineered road cross section meeting traffic density and load requirements. Since this is not a total reconstruction project, the repair methods will vary from applying an asphaltic leveling course on the existing surface to demolishing and reconstructing the total road cross section. The work method selected will depend on conditions along the route of each section to be restored. The completed roads will have painted traffic striping, proper crown, adequate surface thickness, engineered base-course, compacted subgrade and side drainage.
- c. Roadwork Project - Safety Program, Lawrence Berkeley Laboratory (LBL), Berkeley, California - This project provides for increasing the radius of curves at various intersections and widening of the main access road to the Laboratory. Vertical and horizontal curves will be removed and roads realigned to conform to the Department of Transportation Highway Design Standard. Included will be separation of pedestrian and vehicular traffic in some areas of the complex.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Road repair, various locations (ANL, INEL, LBL, RL) 2. Project Number: 84-ER-103

8. Brief Physical Description of Project (continued)

- d. Repair, Existing Roads, Argonne National Laboratory (ANL), Argonne, Illinois - This project will reconstruct approximately 10 miles of roadway serving the ANL-East Laboratory site. Included in this reconstruction effort are the main entrance routes to the site and those roads serving the principal permanent buildings and facilities. Roads serving the buildings that are to be deactivated will not be reconstructed.

Work to be performed includes:

- a. Repair of base course failures
- b. Resurfacing with 2-1/2 inch bituminous concrete topping
- c. Rework and repair of road shoulders
- d. Raising existing manholes to match new road alterations
- e. Restriping of traffic lanes and crosswalks
- f. Replacement of deteriorated culvert pipes

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

- a. Traffic Safety Improvements, Route 4, Richland, Washington - Route 4 is the arterial servicing the Hanford Site. This roadway was built in 1943 prior to formalization of national policies on highway design. Lack of conformance to current highway design guidelines has created serious traffic hazards on the Hanford Site. In addition, Route 4 has deteriorated over the years. The road surface is cracked and uneven, lanes are narrow, and in most places the shoulders are soft, narrow and rutted. The existing lanes are only 10 feet wide, 2 feet narrower than required by current standards. The 10-foot lanes allow very little maneuvering room, and create heavy traffic loads along the road edge. This stress causes pavement edge break-up and hence further reduction of lane width, and deep ruts in the shoulders. These factors have caused increased maintenance and safety problems. This project proposes to improve that portion of Route 4 from the 1100 Area to the Wye Barricade, a distance of approximately 13 miles. This area carries the greatest amount of traffic and has the highest accident rate.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Road repair, various locations (ANL, INEL, LBL, RL) 2. Project Number: 84-ER-103

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

b. INEL Road Refurbishment, Idaho National Engineering Laboratory (INEL), Idaho - The roads proposed for reconstruction are the sole access to active INEL Facility areas. They have been maintained in continuous use since their original construction during the 1950's and 1960's. Maintenance efforts since that time have included patching, seal coating and surface overlays. Deterioration in the base course and subgrade has progressed to the point that these efforts provide only short term improvement. In addition, pavement edge-breakage has narrowed the road in some sections to less than the minimum required for safe two-lane operation. The current situation has resulted from combinations of the following circumstances:

- o Existing roads that were not designed for current traffic density and loads which have led to continuing surface and subsurface breakdown.
 - o Extreme winter cold temperatures ranging to -40°F causing surface course brittleness and shrinkage leading to extensive cracking, subsequent moisture penetration and subsurface failure.
 - o High summer temperatures ranging to 100°F causing road weakness in areas of minimum road stability. This results in ruts, depressions and washboards on the road surface.
 - o Moisture entry through surface cracks and unpaved shoulders. This causes reduced subsurface support strength and surface breaking.
 - o Frost heave caused by soil capillarity and poor drainage during winter weather. This results in both surface breakup and subsurface failure.
- c. Road Project - Safety Program, Lawrence Berkeley (LBL), Berkeley, California - The existing radius of the curves of the main access road to the laboratory are such that semi-trailers are found to go over the road center line. In some areas of the laboratory pedestrians and vehicles must use the same roadway.

Improvement of the laboratory vehicular and pedestrian systems is required to bring the old substandard roads and sidewalks in the hilly LBL terrain up to acceptable code and safety standards by improving alignment sight distances, removing horizontal and vertical curves, increasing the radius of curves and widening the access road to the site.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Road repair, various locations (ANL, INEL, LBL, RL) 2. Project Number: 84-ER-103

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

This project will be constructed at the Lawrence Berkeley Laboratory which is non-Government owned property.

- d. Repair Existing Roads, Phase I, Argonne National Laboratory (ANL), Argonne, Illinois - The site roads are deteriorating at a faster rate than they can be economically repaired. This deterioration reflects the age of the roads, approximately 30 years, and the severity of the climate at the ANL-East site. Failing road edges, the result of base course failures and late winter thaws, cannot be corrected by patching methods. The use of operating funds in an attempt to maintain the roadways in serviceable condition has resulted in unsatisfactory road conditions at best, and a heavy drain on the Laboratory's resources.

A full reconstruction program for those sections of the roadway network which are in worst condition will be provided by this project.

10. Details of Cost Estimate*

	Richland	INEL	LBL	ANL	Total
a. Engineering and design and inspection.....	\$ 900	\$ 535	\$ 165	\$ 200	\$ 1,800
b. Construction costs.....	5,051	6,110	1,045	1,600	13,806
Subtotal.....	5,951	6,645	1,210	1,800	15,606
c. Contingency.....	800	955	190	200	2,145
Total estimated cost.....	\$ 6,751	\$ 7,600	\$1,400	\$2,000	\$17,751

*Conceptual Design Reports completed.

11. Method of Performance

- a. RL Subproject - Design and inspection will be accomplished by a negotiated architect-engineering contract or the on-site architect-engineer firm. The major portion of the construction will be accomplished under fixed-price contracts awarded on the basis of competitive bids. Relocation of any power or utility poles will be accomplished through negotiations with the appropriate utility.

CONSTRUCTION PROJECT DATA SHEETS

I. Title and Location of Project: Road repair, various locations (ANL, INEL, LBL, RL) 2. Project Number: 84-ER-103

II. Method of Performance (continued)

- b. INEL Subproject - Overall responsibilities for design and construction will be assigned to the INEL prime contractors administered by DOE-ID. The INEL contractor will provide technical direction of the design effort. Construction will be accomplished by fixed price subcontracts awarded on the basis of competitive bidding.
- c. LBL Subproject - Design and inspection will be performed under a negotiated architect-engineer contract. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontract awarded on the basis of competitive bidding.
- d. ANL Subproject - Engineering, design and inspection will be performed by Laboratory engineering personnel. Construction will be accomplished by fixed-price contract awarded on the basis of competitive bidding.

Department of Energy
FY 1990 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS
Energy Supply Research and Development - Plant and Capital Equipment
Multiprogram Energy Laboratories - Facilities Support
Multiprogram Energy Laboratories - Environmental Compliance
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: General plant projects Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee	2. Project No.: 90-R-770
3. Date A-E work initiated: 1st Qtr. FY 1990	5. Previous cost estimate: None Date:
3a. Date physical construction starts: 2nd Qtr. FY 1990	6. Current cost estimate: \$ 1,000 Less amount for PE&D: 0 Net cost estimate: \$ 1,000 Date: December 1988
4. Date construction ends: 4th Qtr. FY 1991	

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Obligations</u>	<u>Costs</u>			
			<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>After FY 1990</u>
	1989	\$ 2,500	\$ 0	\$ 625	\$ 1,000	\$ 875
	1990	\$ 1,000	\$ 0	\$ 0	\$ 250	\$ 750

8. Brief Physical Description of Project

These projects provide for the many miscallenuous alterations, additions, modification, replacements, and non-major new construction items required to reduce or eliminate environmentally harmful discharges from ORNL. Examples of anticipated projects are as follows:

- o Gas Cylinder Disposal Facility
 The proposed facility would capture and rebottle gases from leaking cylinders, allowing the disposal of the defective clyinders.
- o Upgrade Building For Mixed Waste

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: General plant projects
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee

2. Project No.: 90-R-770

8. Brief Physical Description of Project (continued)

Building modifications would be made to allow for storage of mixed wastes and contaminated lead awaiting decontamination for reuse.

o Upgrade Fans 7911 Stack

Upgrade of these systems will provide the margin of safety required to assure continued containment and contamination control.

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

o Gas Cylinder Disposal Facility

Currently, there is no facility on the Oak Ridge Reservation for the treatment and disposal of leaking gas cylinders. Leaking cylinders which cannot meet DOE standards for off-site shipment are allowed to bleed to the atmosphere, in violation of air emission standards.

o Upgrade Building For Mixed Wastes

Under the provisions of RCRA, proper storage is needed for mixed waste with surface dose levels greater than 10mr/hr and contaminated lead awaiting decontamination for reuse. These categories of waste do not currently have adequate facilities.

o Upgrade Fans 7911 Stack

Cell ventilation and hot off gas fans at the 7911 stack have been in operation for over 20 years. They serve the High Flux Isotope Reactor, the Transuranium Processing Plant and the Thorium Uranium Recycle Facility. Upgrade of these systems will provide the margin of safety required to assure continued containment and contamination control.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: General plant projects
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee

2. Project No.: 90-R-770

10. Details of Cost Estimate

The estimated costs are preliminary and in general indicate the magnitude of each program. These costs included engineering, design, construction, and inspection.

11. Method of Performance

Design will be on the basis of negotiated architect-engineer contracts. To the extent feasible, construction and procurement will be accomplished by firm fixed-price contracts and subcontracts awarded on the basis of competitive bidding.

Department of Energy
FY 1990 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS
Energy Supply Research and Development - Plant and Capital Equipment
Multiprogram Energy Laboratories - Facilities Support
Multiprogram Energy Laboratories - Environmental Compliance
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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|--|---|
| 1. Title and location of project: Liquid low-level waste collection and transfer systems upgrade
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee | 2. Project No.: 88-R-830 |
| 3. Date A-E work initiated: 1st Qtr. FY 1988

3a. Date physical construction starts: 2nd Qtr. FY 1989

4. Date Construction ends: 4th Qtr. FY 1991 | 5. Previous cost estimate: \$35,000
Date: February 1987

6. Current cost estimate: \$35,000
Less amount for PE&D: 0
Net cost Estimate: \$35,000
Date: December 1988 |

7. <u>Financial Schedule:</u>	<u>Fiscal year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1988	\$35,000	\$ 4,800	\$ 4,800	\$ 572
	1989	0	11,787	11,787	8,100
	1990	0	10,500	10,500	17,600
	1991	0	7,913	7,913	8,728

8. Brief Physical Description of Project

The proposed project will upgrade a portion of the existing Bethel Valley liquid low-level waste (LLW) collection and transfer (CAT) system at Oak Ridge National Laboratory (ORNL) with the best available technology for satisfying regulatory requirements. The LLW-CAT system is an extensive underground piping system which transfers low-level radioactive liquid waste from the waste generating and processing facilities to an evaporator facility for volume reduction. The proposed project includes approximately one mile of 2-inch and 3-inch doubly contained stainless steel pipeline with approximately five stainless steel tanks of nominal 1000-gal capacity located in underground stainless-steel-lined concrete vaults. The pipelines are equipped with an active leak detection system which utilizes pressurized nitrogen and are cathodically protected against

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project:	Liquid low-level waste collection and transfer systems upgrade Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee	2. Project No.:	88-R-830
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8. Brief Physical Description of Project (continued)

corrosion. The tanks have provisions for flow control, pH monitoring, and temperature monitoring and will be equipped with an automatic caustic addition system for pH neutralization. Local monitoring and control stations will be provided and integrated with the existing Waste Operations Control Center (WOCC) to provide monitoring and control of overall CAT system operation.

The project will also provide a new central facility for receiving and discharging to the pipeline system liquid low-level radioactive waste that is transported by truck in tanks and small bottles. The facility will be a single-story building (approximately 4,000 square feet) of standard construction located near the evaporator facility. The facility will have provisions for discharging the tank trucks within contained and ventilated rooms and glove boxes for discharging the small bottles of LLW. Facility features will include diked floors, suitable piping and tankage, glove boxes, and appropriate ventilation and handling equipment to assure operator safety and environmental compliance. New trucks, of a standard chassis designed to meet American Society of Mechanical Engineers (ASME) standards and Department of Transportation (DOT) requirements, will be provided to transport waste. This will provide backup service to maintain the operation of critical facilities during system outages and will provide bottle transportation capability for facilities where the low volume of waste generated does not warrant the cost of pipeline or tank truck service.

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

The purpose of this project is to upgrade a significant portion of ORNL's LLW-CAT system in a cost effective manner which will protect personnel and public safety and health and the environment and meet all applicable regulations as it supports the laboratory's research mission. Since its beginning in the early 1940s, a primary mission of the ORNL has been the support of the Department of Energy's (DOE) programs involving radioactive materials. This effort is expected to continue and grow during the next 50 years and beyond. The LLW system and its CAT component are essential to that effort and, if not kept in operation, will significantly affect ORNL's capabilities for successfully fulfilling that mission.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Liquid low-level waste collection and transfer systems upgrade
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee

2. Project No.: 88-R-830

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

Currently, the majority of the existing system is constructed of 40-year-old technology which is rapidly deteriorating. More than 30 contaminated leak sites have been documented against the existing system, most of those occurring in the last 10-15 years of operation. The most notable incident occurred January 23, 1985, with a release of SR-90 into the Sewage Treatment Plant. Several days later, the concentration of SR-90 at White Oak Dam increased by a factor of 3, exceeding the DOE average monthly limit. After an intensive two-month effort to locate the source of contamination, a broken LLW pipeline was discovered at the Manipulator Repair Facility with a 7-foot-deep hole directly underneath the breakpoint. This type of accident is typical of those expected to occur at an increasing rate as the system gets older and deterioration continues. Hence, this project is urgently needed to stop the recurring leaks of low-level waste with their potential for adverse safety, health, and environmental impact.

During the 1970s and 1980s, the number of regulations and the depth of requirements have increased dramatically in the areas of radioactive and hazardous waste management. During the last two years, actions by both DOE and the EPA have caused an immediate need to fix problems associated with the LLW system and its CAT component.

In April 1985, DOE issued Order 5480.14 requiring that its operating contractors implement the DOE comprehensive environmental response, compensation, and liability act (CERCLA) program. This DOE order requires: 1) the identification and quantification of the presence of hazardous substances that may cause an unacceptable risk to health, safety, and environment, 2) the establishment and implementation of a plan for eliminating sources of contamination and completing the remedial actions necessary for cleanup, and 3) verifying that the actions taken have been successful. The proposed project is a necessary part of the elimination of sources of contamination.

In July 1985, EPA issued its proposed standards for hazardous waste storage and treatment tank systems. These are RCRA regulations that fall under 40 CFR parts 260-266 and 270. For existing tank systems, either full secondary containment or a groundwater monitoring system is required, with leak testing every six months. For new tank systems, full secondary containment with an integral leak detection system and cathodic protection is required. The existing CAT system will not comply to these regulations when they are promulgated.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Liquid low-level waste collection and transfer systems upgrade Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee	2. Project No.: 88-R-830
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9. Purpose, Justification of Need for, and Scope of Project (continued)

In December 1977, the Clean Water Act (CWA) was issued by the federal government and in the same time frame the Water Quality Control Act was issued by the state of Tennessee. The acts complement each other and basically state that discharges of pollutants into public waters must be eliminated. Currently, under upset conditions discharges are frequently unacceptable compared to existing standards.

The RCRA Part application, recently submitted by ORNL for the low-level waste (LLW) system, identified the CAT component as a RCRA hazardous waste system. Therefore, the system is subject to the proposed hazardous waste storage and treatment tank systems requirements established by EPA. With its history of leak problems and overall general age and deteriorated condition, it certainly has been a generator of CERCLA waste and, until upgraded, will continue to be a source of additional contamination. Although not labeled as a CERCLA facility, it is definitely a major element of DOE's program for CERCLA compliance.

In summary, this project's purpose is to provide a cost effective LLW-CAT system upgrade which supports the laboratory's research mission, protects personnel and public safety and the environment and meets all regulatory requirements.

As presented above, these regulations include DOE Order 5480.14, 40 CFR parts 260-266 and 270, covering the Resource Conservation and Recovery Act (RCRA), and the Clean Water Acts. The regulating agencies are DOE, EPA, and the state of Tennessee. The regulations basically require ORNL to have an LLW-CAT system which has double containment, active leak detection, and corrosion protection on critical contact surfaces. The regulators are likely to require compliance within the next 2-5 years, or a strict compliance schedule which requires negotiation.

With this project as a DOE response to the system's deterioration the potential for negotiations of a compliance schedule that will avoid the shutdown of significant facilities seems reasonable. Without prompt funding of this project the shutdown of significant facilities is a very clear possibility in the next 2-4 years or sooner.

CONSTRUCTION PROJECT DATA SHEETS

<p>1. Title and location of project: Liquid low-level waste collection and transfer systems upgrade Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee</p>	<p>2. Project No.: 88-R-830</p>
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9. Purpose, Justification of Need for, and Scope of Project (continued)

If this project is not implemented, and the existing system is shut down, several critical facilities at ORNL will cease operation with severe consequences to DOE and others who depend on the flexible capabilities and unique products found at ORNL. For example, ORNL produces the nation's (and in some cases the world's) only supply of certain isotopes (e.g. ²⁵²Cf) which are used for a variety of military and health-care purposes.

ORNL also provides a lot of special work for others which involves unique equipment capabilities like hot cells that cannot be performed anywhere other than at ORNL. The majority of this unique capability, which involves radioactive work, will be lost if this project is not implemented and the LLW-CAT system is shut down.

The scope of the project was defined by the need to use the "best available technology" and provide service to only those critical facilities which offer significant benefits to ORNL and DOE. The chosen technology has been used at ORNL in the same application for almost 10 years with excellent results. Only those facilities that could justify a strong need for continued LLW-CAT pipeline service were included in the scope.

10. Details of Cost Estimate *

	<u>Item Costs</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ about 12% of construction, Item b.....		\$ 3,000
b. Construction costs.....		25,000
(1) Land improvements.....	\$ 36	
(2) New buildings.....	405	
(3) Special facilities.....	24,518	
(4) Outside utilities.....	41	
Subtotal.....		28,000
c. Contingency at approximately 25% of above costs.....		7,000
Total estimated cost.....		\$35,000

* These cost numbers are based on a Conceptual Design Report completed in February 1986 at a cost of \$600,000.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Liquid low-level waste collection and transfer systems upgrade
Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee

2. Project No.: 88-R-830

II. Method of Performance

Design and inspection will be performed under negotiated architect-engineer contract and by the operating contractor. Where the construction involves contact with radioactive contamination, a cost-plus-award-fee (CPAF) contractor qualified in such work will be utilized.