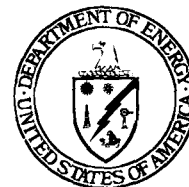


# Congressional Budget Request

Energy Supply Research and Development  
Nuclear Waste Fund  
Isotope Production and Distribution Fund  
Basic Research User Facilities

Volume 2

FY 1989



U.S. Department of Energy

Assistant Secretary,  
Management and Administration  
Office of the Controller  
Washington, D.C. 20585

February 1988

DEPARTMENT OF ENERGY  
FISCAL YEAR 1989 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
NUCLEAR WASTE FUND  
ISOTOPE PRODUCTION AND DISTRIBUTION FUND  
BASIC RESEARCH USER FACILITIES

VOLUME 2

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DEPARTMENT OF ENERGY  
 FISCAL YEAR 1989 CONGRESSIONAL BUDGET REQUEST  
 SUMMARY OF ESTIMATES BY APPROPRIATIONS  
 BUDGET AUTHORITY IN THOUSANDS OF DOLLARS

	FY 1987 ACTUAL	FY 1988 ESTIMATE	FY 1989 REQUEST
	-----	-----	-----
APPROPRIATIONS BEFORE THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEES:			
ENERGY SUPPLY RESEARCH AND DEVELOPMENT..	\$1,258,137	\$1,860,087	\$1,969,760
URANIUM ENRICHMENT.....	1,209,494	950,000	1,184,000
GENERAL SCIENCE AND RESEARCH.....	326,596	355,108	364,986
ISOTOPE PRODUCTION AND DISTRIBUTION FUND	509	89	16,243
BASIC RESEARCH USER FACILITIES.....	473,206	574,945	972,613
ATOMIC ENERGY DEENSE ACTIVITIES.....	7,481,852	7,749,364	8,100,000
DEPARTMENTAL ADMINISTRATION.....	226,874	164,243	177,814
ALASKA POWER ADMINISTRATION.....	2,881	3,026	3,159
BONNEVILLE POWER ADMINISTRATION.....	432,259	165,000	136,000
SOUTHEASTERN POWER ADMINISTRATION.....	19,647	27,400	36,267
SOUTHEASTERN - CONTINUING FUND.....	3,772	---	---
SOUTHWESTERN POWER ADMINISTRATION.....	25,337	16,648	15,389
WESTERN AREA POWER ADMINISTRATION.....	238,008	249,515	298,413
WESTERN AREA POWER EMERGENCY FUND.....	225	24	---
FEDERAL ENERGY REGULATORY COMMISSION....	99,079	100,000	106,760
NUCLEAR WASTE FUND.....	499,000	360,000	448,832
GEOHERMAL RESOURCES DEVELOPMENT FUND....	72	72	75
	-----	-----	-----
SUBTOTAL, APPROPRIATIONS BEFORE THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEES.....	12,296,948	12,575,521	13,830,311

DEPARTMENT OF ENERGY  
 FISCAL YEAR 1989 CONGRESSIONAL BUDGET REQUEST  
 SUMMARY OF ESTIMATES BY APPROPRIATIONS  
 BUDGET AUTHORITY IN THOUSANDS OF DOLLARS

	FY 1987 ACTUAL -----	FY 1988 ESTIMATE -----	FY 1989 REQUEST -----
APPROPRIATIONS BEFORE THE INTERIOR AND RELATED AGENCIES SUBCOMMITTEES:			
ALTERNATIVE FUELS PRODUCTION.....	437	---	---
CLEAN COAL TECHNOLOGY.....	---	50,000	525,000
FOSSIL ENERGY RESEARCH AND DEVELOPMENT..	293,171	326,975	166,992
NAVAL PETROLEUM AND OIL SHALE RESERVES..	122,177	159,663	185,071
ENERGY CONSERVATION.....	232,362	309,517	89,359
ENERGY REGULATION.....	23,400	21,565	20,772
EMERGENCY PREPAREDNESS.....	6,044	6,172	6,154
STRATEGIC PETROLEUM RESERVE.....	147,433	164,162	173,421
STRATEGIC PETROLEUM ACCOUNT.....	---	438,744	1,017,907
ENERGY INFORMATION ACTIVITIES.....	60,301	61,398	62,856
	-----	-----	-----
SUBTOTAL, INTERIOR AND RELATED AGENCIES SUBCOMMITTEES.....	885,325	1,538,196	2,247,532
SUBTOTAL, ENERGY AND WATER DEVELOPMENT SUBCOMMITTEES.....	12,296,948	12,575,521	13,830,311
	-----	-----	-----
SUBTOTAL, DEPARTMENT OF ENERGY.....	13,182,273	14,113,717	16,077,843
PERMANENT - INDEFINITE APPROPRIATIONS:			
PAYMENTS TO STATES.....	912	1,839	1,909
	-----	-----	-----
TOTAL, DEPARTMENT OF ENERGY.....	\$13,183,185	\$14,115,556	\$16,079,752
	=====	=====	=====

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL STAFFING REQUEST  
 TOTAL WORK FORCE

	FY1987 FTE USAGE	FY1988 -FY87	FY1988 CONGR REQ	FY1989 -FY88	FY1989 CONGR REQ
ENERGY & WATER SUBCOMMITTEE					
HEADQUARTERS	4,697	264	4,961	73	5,034
FIELD	9,356	58	9,414	-75	9,339
SUBCOMMITTEE TOTAL	14,053	322	14,375	-2	14,373
INTERIOR SUBCOMMITTEE					
HEADQUARTERS	1,181	66	1,247	-111	1,136
FIELD	882	25	907	-140	767
SUBCOMMITTEE TOTAL	2,063	91	2,154	-251	1,903
GRAND TOTAL	16,116	413	16,529	-253	16,276
ADJUSTMENT		-263	-263	-209	-472
ADJUSTED TOTAL	16,116	150	16,266	-462	15,804

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL STAFFING REQUEST  
 TOTAL WORK FORCE

	FY1987 FTE USAGE	FY1988 -FY87	FY1988 CONGR REQ	FY1989 -FY88	FY1989 CONGR REQ
10:ENERGY SUPPLY RESEARCH AND DEV	922	14	936	10	946
HEADQUARTERS	644	7	651	10	661
FIELD	278	7	285	0	285
15:URANIUM ENRICHMENT	59	8	67	0	67
HEADQUARTERS	48	8	56	0	56
FIELD	11	0	11	0	11
20:GENERAL SCIENCE AND RESEARCH	42	-3	39	7	46
HEADQUARTERS	42	-3	39	7	46
25:ATOMIC ENERGY DEFENSE ACTIVITI	2,782	88	2,870	40	2,910
HEADQUARTERS	492	62	554	21	575
FIELD	2,290	26	2,316	19	2,335
30:DEPARTMENTAL ADMINISTRATION	3,333	133	3,466	6	3,472
HEADQUARTERS	1,756	79	1,835	6	1,841
FIELD	1,577	54	1,631	0	1,631
34:ALASKA POWER ADMINISTRATION	36	-1	35	0	35
FIELD	36	-1	35	0	35
36:BONNEVILLE POWER ADMIN	3,398	-18	3,380	-50	3,330
FIELD	3,398	-18	3,380	-50	3,330
38:SOUTHEASTERN POWER ADMIN	38	2	40	0	40
FIELD	38	2	40	0	40
42:SOUTHWESTERN POWER ADMIN	192	-6	186	0	186
FIELD	192	-6	186	0	186
46:WAPA - POWER MARKETING	1,160	-21	1,139	0	1,139
FIELD	1,160	-21	1,139	0	1,139
50:WAPA - COLORADO RIVER BASIN	219	21	240	0	240
FIELD	219	21	240	0	240
52:FEDERAL ENERGY REGULATORY COMM	1,562	97	1,659	0	1,659
HEADQUARTERS	1,562	97	1,659	0	1,659
54:NUCLEAR WASTE FUND	307	8	315	-15	300
HEADQUARTERS	152	14	166	29	195
FIELD	155	-6	149	-44	105
56:GEOTHERMAL RESOURCES DEV FUND	1	0	1	0	1
HEADQUARTERS	1	0	1	0	1
63:CLEAN COAL TECHNOLOGY	0	45	45	13	58
HEADQUARTERS	0	21	21	5	26
FIELD	0	24	24	8	32
65:FOSSIL ENERGY RESEARCH AND DEV	709	-6	703	-133	570
HEADQUARTERS	141	-3	138	-10	128
FIELD	568	-3	565	-123	442
70:NAVAL PETROL & OIL SHALE RES	89	6	95	0	95
HEADQUARTERS	17	5	22	0	22
FIELD	72	1	73	0	73
75:ENERGY CONSERVATION	320	32	352	-109	243
HEADQUARTERS	197	30	227	-84	143
FIELD	123	2	125	-25	100
80:EMERGENCY PREPAREDNESS	64	7	71	0	71
HEADQUARTERS	64	7	71	0	71
81:ECONOMIC REGULATION	288	-13	275	-22	253
HEADQUARTERS	288	-13	275	-22	253
85:STRATEGIC PETROLEUM RESERVE	147	0	147	0	147
HEADQUARTERS	28	-1	27	0	27
FIELD	119	1	120	0	120
90:ENERGY INFORMATION ACTIVITIES	446	20	466	0	466
HEADQUARTERS	446	20	466	0	466
94:ADVANCES FOR CO-OP WORK	2	0	2	0	2
FIELD	2	0	2	0	2
 GRAND TOTAL	 16,116	 413	 16,529	 -253	 16,276
ADJUSTMENT		-263	-263	-209	-472
ADJUSTED TOTAL	16,116	150	16,266	-462	15,804

DEPARTMENT OF ENERGY  
FY 1989 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 extraordinary 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 to (1) maintain operations of the laboratories in a safe, cost effective, and productive manner, and (2) reduce the backlog of facilities 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 subprogram originated in FY 1985 to address non-defense environmental deficiencies at ORNL.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 OFFICE OF ENERGY RESEARCH  
 (dollars in thousands)

LEAD TABLE

Multiprogram Energy Laboratories - Facilities Support

Activity	FY 1987	FY 1988	FY 1989 Base	FY 1989 Request	Program Change Request vs Base	
					Dollar	Percent
General Purpose Facilities						
Construction.....	\$31,440	\$28,500	\$28,500	\$41,400	\$+12,900	+ 45%
Environmental Compliance-ORNL						
Operating.....	14,255	12,900	12,900	8,770	\$- 4,130	- 32%
Capital Equipment.....	1,000	400	400	305	- 95	- 24%
Construction.....	10,000	11,800	11,800	15,400	+ 3,600	+ 31%
Subtotal.....	25,255	25,100	25,100	24,475	- 625	- 2%
Total.....	\$56,695	\$53,600	\$53,600	\$65,875	\$+12,275	+ 23%
Operating.....	(\$14,255)	(\$12,900)	(\$12,900)	(\$8,770)	- 4,130	- 32%
Capital Equipment.....	(1,000)	(400)	(400)	(305)	- 95	- 24%
Construction.....	(41,440)	(40,300)	(40,300)	(56,800)	+16,500	+ 41%

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



DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

SUMMARY OF CHANGES

Multiprogram Energy Laboratories – Facilities Support

FY 1988 Appropriation.....	\$ 53,600
- New construction starts at various locations for the General Purpose Facilities subprogram.....	+ 11,571
- Continue and/or complete ongoing projects.....	- 4,558
- Reduce Environmental Compliance operating expenses; DOE Defense Programs responsibilities increase.....	- 4,130
- Reduce capital equipment; provide for general plant projects for ORNL Environmental Compliance subprogram.....	+ 2,405
- Continue project 88-R-830 for liquid low level waste collection and transfer system upgrade.....	+ 6,987
FY 1989 Congressional Budget Request.....	<u>\$ 65,875</u>

DEPARTMENT OF ENERGY  
FY 1989 CONGRESSIONAL BUDGET REQUEST

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 skilled investigators, 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 facilities 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 1987 -----	FY 1988 -----	FY 1989 -----	% Change -----
General Purpose Facilities...	\$ 31.440	\$ 28,500	\$ 41,400	+ 45%

II. B. Major Laboratory and Facility Funding

Argonne National Laboratory....	\$ 8,393	\$ 9,275	\$ 11,884	+ 28%
Brookhaven National Laboratory.	7,380	1,663	8,334	+400%
Hanford Engineering Development Laboratory*.....	892	575	375	- 35%
Idaho National Engineering Lab*.	1,807	470	490	+ 4%
Lawrence Berkeley Laboratory....	1,215	6,190	9,893	+ 60%
Lawrence Livermore Nat. Lab*....	3,600	150	312	+108%
Oak Ridge National Laboratory..	6,053	9,237	7,384	- 20%
Pacific Northwest Laboratory...	2,100	940	2,728	+190%
	-----	-----	-----	-----
Total.....	\$ 31,440	\$ 28,500	\$ 41,400	+ 45%

III. Activity Descriptions

Program Activity	FY 1987	FY 1988	FY 1989
-----	-----	-----	-----
GENERAL PURPOSE FACILITIES			
Construction	Continue nine ongoing projects for \$23,671, and eight new starts for \$7,769 (three building utilities rehabilitation and five general utilities projects).	Continues fifteen previously started projects consistent with planned schedules (\$22,730). Allows for nine 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)	Will provide for continuation of 19 ongoing projects (\$29,829) consistent with planned schedules and initiation of 14 new projects including 2 environmental related projects, 1 road safety project, 2 fire protection projects, 3 utility projects and 6 building rehabilitation/upgrade/replacement projects. (\$11,571) This level would address high priority operational requirements and would start reducing the large backlog of building deficiencies. (\$41,400)
-----	-----	-----	-----
Total General Purpose Facilities	\$31,440	\$28,500	\$41,400

\* 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.

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 bring all operational systems up to current and expected environmental standards and will perform 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 million 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 1989 budget will provide funds to continue two high priority construction projects related to the liquid waste systems at ORNL. These are the Non-Radiological Process Waste Treatment System (86-R-801, TEC \$18,000,000) and the Low-Level Waste Collection and Transfer System Upgrade (88-R-830, TEC \$35,000,000).

This budget will also provide for characterization and assessment and remedial investigations and feasibility studies (RIFS) of previously contaminated areas that are the result of Energy Research program activities. The total estimated cost of such remedial actions will not be available until the RIFS are completed. The remedial investigations and feasibility studies portion of the operating budget has decreased because the bulk of the remaining actions are the responsibility of the DOE Defense Programs. This program will also continue development of improved environmental monitoring systems (including groundwater systems).

II. A. Summary Table

Program Activity	FY 1987	FY 1988	FY 1989	% Change
-----	-----	-----	-----	-----
Operating				
Upgrade Operational Systems...	\$ 6,055	\$ 4,600	\$ 4,470	- 3%
Remedial Action.....	8,200	8,300	4,300	- 48%
	-----	-----	-----	-----
Total Operating.....	14,255	12,900	8,770	- 32%
Capital Equipment.....	1,000	400	305	- 24%
Construction.....	10,000	11,800	15,400	+ 31%
	-----	-----	-----	-----
Total Environmental				
Compliance-ORNL.....	\$ 25,255	\$ 25,100	\$ 24,475	- 2%

II. B. Major Laboratory and Facility Funding

Oak Ridge National Laboratory..	25,255	25,100	24,475	- 2%
	-----	-----	-----	-----
Total.....	\$ 25,255	\$ 25,100	\$ 24,475	- 2%

III. Activity Descriptions

Program Activity	FY 1987	FY 1988	FY 1989
-----			
OPERATING			
Upgrade Operational Systems	Perform studies to assess condition of operating systems and plan for needed upgrades. (\$6,055)	Perform studies to assess condition of operating systems and plan for needed upgrades. (\$4,600)	Perform studies to assess condition of operating systems and to develop plan for needed procedural and physical upgrades. (\$4,470)
-----			
Remedial Actions	Continue remedial investigations and feasibility studies on previously contaminated sites, and continue development of a groundwater monitoring system. (\$8,200)	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. (\$4,300)
-----			
Subtotal, Operating Expenses	\$14,255	\$12,900	\$ 8,770
-----			
CAPITAL EQUIPMENT	Provides equipment needed to support clean-up studies and activities. (\$1,000)	Provides equipment needed to support clean-up studies and activities. (\$400)	Provides equipment needed to support cleanup studies and activities. (\$305)
-----			

Program Activity	FY 1987	FY 1988	FY 1989
CONSTRUCTION	Continue the Non-Radiological Process Waste Treatment Facilities Project (86-R-801). (\$7,000)	Continue the Non-Radiological Process Waste Treatment Facilities Project (86-R-801). (\$7,000)	Continue 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)
	General Plant Projects (87-R-770) undertaken to correct current deficiencies in operating systems. (\$3,000)	No activity.	GPP undertaken to correct current deficiencies in operating systems. (\$2,500)
Subtotal Environmental Compliance (ORNL) Construction	\$10,000	\$11,800	\$15,400
Total Environmental Compliance	\$25,255	\$25,100	\$24,475
Total Multiprogram Energy Laboratories - Facilities Support	\$56,695	\$53,600	\$65,875

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY SUMMARY

CONSTRUCTION PROJECTS

Multiprogram Energy Laboratories - Facilities Support

IV. A. Construction Project Summary

<u>Project No.</u>	<u>Project Title</u>	<u>Total Prior Year Obligations</u>	<u>FY 1988 Request</u>	<u>FY 1989 Request</u>	<u>Remaining Balance</u>	<u>TEC</u>
Multiprogram Energy Laboratories - General Purpose Facilities (MEL-GPF)						
89-R-113	Environmental Upgrades (BNL)	\$ 0	\$ 0	\$ 1,500	\$ 8,100	\$ 9,600
89-R-112	Replace PCB Transformers (ANL)	0	0	1,000	1,380	2,380
89-R-111	Building Utilities (PNL)	0	0	668	2,332	3,000
89-R-110	Electrical Systems Upgrade (ORNL)	0	0	854	1,346	2,200
89-R-109	Measurements and Controls Support Facility (ORNL)	0	0	1,100	3,100	4,200
89-R-108	Road Safety Improvements (ORNL)	0	0	2,520	0	2,520
89-R-107	Original Labsite Substation (LBL)	0	0	250	2,550	2,800
89-R-106	Instrumentation Support Laboratory Rehabilitation (LBL)	0	0	200	1,700	1,900
89-R-105	Building Addition (BNL)	0	0	1,625	0	1,625

<u>Project No.</u>	<u>Project Title</u>	<u>Total Prior Year Obligations</u>	<u>FY 1988 Request</u>	<u>FY 1989 Request</u>	<u>Remaining Balance</u>	<u>TEC</u>
89-R-104	Central Shops Alteration and Addition (BNL)	0	0	300	1,300	1,600
89-R-103	Boiler Replacement (BNL)	0	0	409	2,941	3,350
89-R-102	Fire Protection Improvements Phase III (BNL)	0	0	645	2,355	3,000
89-R-101	Rehabilitation of Domestic and Firewater, Pumping and Storage Systems (ANL)	0	0	150	1,440	1,590
89-R-100	Transportation Facility Replacement (ANL)	0	0	350	3,540	3,890
88-R-817	Upgrade Fire Protection (ORNL)	0	770	980	0	1,750
88-R-814	Sanitary Sewage Treatment Facility (PNL)	0	940	2,060	0	3,000
88-R-812	Hazardous Waste Handling Facility (LBL)	0	500	3,950	200	4,650
88-R-809	Plant Modifications to Comply with EPA Requirement (ANL)	0	820	1,000	0	1,820
88-R-807	Electrical System Rehabilitation Phase I (ANL)	0	350	2,150	2,560	5,060
88-R-806	Environmental Health and Safety Project (LBL)	0	850	3,448	6,027	10,325
88-R-805	Environmental Improvements (BNL)	0	565	1,946	1,489	4,000
88-R-804	Building Piping Systems Upgrade (ORNL)	0	520	1,330	0	1,850
88-R-802	Multiprogram Laboratory Building Rehabilitation (BNL)	0	455	1,445	0	1,900
87-R-759	Upgrade Steam Distribution System (ORNL)	1,328	5,472	0	0	6,800
87-R-758	Rehabilitate Mechanical Utilities (LBL)	915	3,000	1,585	0	5,500
87-R-757	Electric System Rehabilitation (LBL)	300	1,840	460	0	2,600



<u>Project No.</u>	<u>Project Title</u>	<u>Total Prior Year Obligations</u>	<u>FY 1988 Request</u>	<u>FY 1989 Request</u>	<u>Remaining Balance</u>	<u>TEC</u>
87-R-756	Water Line Replacement (ANL)	566	1,500	3,134	0	5,200
87-R-755	Mechanical Systems Rehabilitation (ANL)	600	2,100	500	0	3,200
87-R-753	Rehabilitate Laboratory Space (ANL)	1,235	3,600	3,600	3,600	12,035
87-R-752	Piping System Restoration (ORNL)	725	2,475	600	0	3,800
86-R-726	Fire Protection Improvements Phase II (BNL)	2,161	375	464	0	3,000
85-R-709	Central Chilled Water Plant (ANL)	4,562	638	0	0	5,200
85-R-707	Hanford Site Fire Alarm System Upgrade (RL)*	3,900	575	375	0	4,850
85-R-706	Medical Facilities (LLNL)*	6,838	150	312	0	7,300
85-R-702	Replace Laboratory Roofs (ANL)	8,683	267	0	0	8,950
85-R-701	Central Chilled Water Facility (BNL)	14,732	268	0	0	15,000
84-ER-103	Road Repairs (INEL, LBL, RL, ANL)*	<u>16,345</u>	<u>470</u>	<u>490</u>	<u>446</u>	<u>17,751</u>
Subtotal, General Purpose Facilities		62,890	28,500	41,400	46,406	XXX
<u>Environmental Compliance (ORNL)</u>						
89-R-770	General Plant Projects (ORNL)	0	0	2,500	0	2,500
88-R-830	Liquid Low-Level Collection and Transfer System Upgrade (ORNL)	0	4,800	11,787	18,413	35,000

\* 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.

<u>Project No.</u>	<u>Project Title</u>	<u>Total</u>			<u>Remaining</u>	<u>TEC</u>
		<u>Prior Year</u>	<u>FY 1988</u>	<u>FY 1989</u>		
		<u>Obligations</u>	<u>Request</u>	<u>Request</u>	<u>Balance</u>	
86-R-801	Non-Radiological Process Waste Treatment Project (ORNL)	<u>9,887</u>	<u>7,000</u>	<u>1,113</u>	<u>0</u>	<u>18,000</u>
	Subtotal, Environmental Compliance	<u>9,887</u>	<u>11,800</u>	<u>15,400</u>	<u>18,413</u>	<u>XXX</u>
	Total, MEL-FS	<u>\$ 72,777</u>	<u>\$ 40,300</u>	<u>\$ 56,800</u>	<u>\$ 64,819</u>	<u>XXX</u>

DEPARTMENT OF ENERGY  
 FY 1989 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
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2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1989	\$1,500	\$1,500	\$1,000
1990	\$6,800	\$6,800	\$6,000
1991	\$1,300	\$1,300	\$2,000
1992	\$0	\$0	\$600

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) \$1,500,000 is requested for FY 1989 funding. During FY 1989 detailed design (by a negotiated Architect/Engineering contractor) will be completed, along with quality assurance and safety management analyses.

DEPARTMENT OF ENERGY  
 FY 1989 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) \$1,000,000 is requested for FY 1989 funding. The Architect/Engineering contract will be negotiated and detailed design will be completed. Construction will start late in FY 1989.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

- |  |  |
|--|--|
| 1. Project title and location: 89-R-111 Building utilities,<br>Phase I, Pacific Northwest<br>Laboratory (PNL),<br>Richland, Washington | Project TEC: \$ 3,000<br>Start Date: FY 1989<br>Completion Date: FY 1991 |
|--|--|

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1989	\$668	\$668	\$668
1990	\$2,332	\$2,332	\$2,332

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) \$668,000 is requested for FY 1989 funding. The Architect/Engineering contract will be negotiated and detailed design will be completed.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 89-R-110 Electrical systems upgrade, Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee
- Project TEC: \$ 2,200  
 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	\$854	\$854	\$200
1990	\$1,346	\$1,346	\$1,100
1991	\$0	\$0	\$900

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 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.
- (c) \$854,000 is requested for FY 1989 funding. The Architect/Engineering contract will be negotiated and detailed design will be completed. Construction will start late in FY 1989.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 89-R-109 Measurements and controls support facility, Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee
- Project TEC: \$ 4,200  
 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	\$1,100	\$1,100	\$965
1990	\$3,100	\$3,100	\$1,400
1991	\$0	\$0	\$1,835

3. Narrative:

- (a) This project will construct a two-story building providing approximately 20,000 sq. ft. as a replacement for a 1943 deteriorated wooden structure on the same site.
- (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 1989 funding. The Architect/Engineering contract will be negotiated and detailed design will be completed. Construction will start in late FY 1989.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 89-R-108 Road 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	\$2,520	\$2,520	\$400
1990	\$0	\$0	\$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) Full project funding of \$2,520,000 is requested in FY 1989 to cover detail design and to obligate construction activity.



DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 89-R-107 Original labsite substation, Lawrence Berkeley Laboratory (LBL), Berkeley, California
- Project TEC: \$ 2,800  
 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	\$250	\$250	\$150
1990	\$2,550	\$2,550	\$780
1991	\$0	\$0	\$1,870

3. Narrative:

- (a) This project is the second of several elements to improve the reliability of the electrical distribution system of the entire laboratory. It will install a new substation and provide for new distribution circuits to laboratory facilities.
- (b) Current and future programmatic activities require reliable and economic power. The existing electrical distribution system is 40 years old. Deterioration of distribution cables and switching equipment has resulted in power outages and interruption of programmatic activities.
- (c) \$250,000 is requested for FY 1989 funding. During FY 1989 an architect/engineering contractor will be selected and begin detailed design work.

DEPARTMENT OF ENERGY  
FY 1989 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
(dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 89-R-106 Instrumentation support  
laboratory rehabilitation,  
Lawrence Berkeley  
Laboratory (LBL), Berkeley,  
California
- Project TEC: \$ 1,900  
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	\$200	\$200	\$110
1990	\$1,700	\$1,700	\$990
1991	\$0	\$0	\$800

3. Narrative:

- (a) This project will rehabilitate 4,700 sq. ft. of office and laboratory space on the third floor of Building 70A, a multiprogram laboratory, to provide improved and upgraded cleanroom facilities.
- (b) This project will rehabilitate the essential core facilities that provide instrumentation support to all R&D programs at LBL. The obsolescence of existing instrumentation support facilities severely limits adequate and timely support to R&D activities.
- (c) \$200,000 is requested for FY 1989 funding. During FY 1989 detailed design (by a negotiated Architect/Engineering contractor) will be completed.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 89-R-105 Building addition, Project TEC: \$ 1,625  
 Brookhaven National Start Date: FY 1989  
 Laboratory (BNL), Completion Date: FY 1990  
 Upton, New York

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1989	\$1,625	\$1,625	\$800
1990	\$0	\$0	\$825

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 1989 to cover detailed design and to contract for construction.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 89-R-104 Central shops alteration and addition, Brookhaven National Laboratory (BNL), Upton, New York
- Project TEC: \$ 1,600  
 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	\$300	\$300	\$300
1990	\$1,300	\$1,300	\$1,300

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) \$300,000 is requested for FY 1989 funding. During FY 1989 detailed design (by a negotiated Architect/Engineering contractor) will be completed.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 89-R-103 Boiler replacement,  
 Brookhaven National  
 Laboratory (BNL), Upton,  
 New York
- Project TEC: \$ 3,350  
 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	\$409	\$409	\$200
	1990	\$2,941	\$2,941	\$600
	1991	\$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) \$409,000 is requested for FY 1989 funding. During FY 1989 detailed design (by a negotiated Architect/Engineering contractor) will be completed.

DEPARTMENT OF ENERGY  
 FY 1989 OCONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - 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) \$645,000 is requested for FY 1989 funding. The Architect/Engineering contract will be negotiated and detailed design will be completed. Construction will start in late FY 1989.

DEPARTMENT OF ENERGY  
 FY 1989 OCONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 89-R-101 Rehabilitation of domestic and firewater, pumping and storage system, Argonne National Laboratory (ANL) Argonne, Illinois
- Project TEC: \$ 1,590  
 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	\$150	\$150	\$150
1990	\$1,440	\$1,440	\$1,440

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 1989 funding. During FY 1989 detailed design (by a negotiated Architect/Engineering contractor) will be completed.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 89-R-100 Transportation facility replacement, Argonne National Laboratory (ANL), Argonne, Illinois
- Project TEC: \$ 3,890  
 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	\$350	\$350	\$150
1990	\$1,270	\$1,270	\$1,470
1991	\$2,270	\$2,270	\$2,270

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 1989 funding. During FY 1989 detailed design (by a negotiated Architect/Engineering contractor) will be completed.



DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

- |   |  |
|---|--|
| 1. Project title and location: 88-R-817 Upgrade Fire Protection<br>Oak Ridge National Laboratory (ORNL)<br>Oak Ridge, Tennessee | Project TEC: \$ 1,750<br>Start Date: FY 1988<br>Completion Date: FY 1990 |
|---|--|

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 770	\$ 770	\$ 280
1989	980	980	855
1990	0	0	615

3. Narrative:

- (a) This project will provide new or updated fire protection systems throughout the Y-12 Plant site. The work will include the installation of sprinkler systems, early warning devices, and improved systems to facilitate efficient firefighting efforts in the ORNL research facilities at Y-12.
- (b) The purpose of this project is to correct deficiencies that have been identified by the operating contractor fire protection audits and DOE audits. Correction of these deficiencies will help bring the ORNL Facilities at Y-12 into compliance with DOE Order 5480.1.
- (c) \$980,000 is requested for FY 1989 funding. Construction will begin this year.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 88-R-814 Sanitary Sewage Treatment Facility	Project TEC: \$ 3,000
Pacific Northwest Laboratory	Start Date: FY 1988
Richland, Washington	Completion Date: FY 1990

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 940	\$ 940	\$ 420
1989	2,060	2,060	1,800
1990	0	0	780

3. Narrative:

- (a) This project will provide a new sanitary sewage treatment facility (300,000 gallons/day capacity). Construction will include a 700 sq. ft. building, ponds, diversion systems and 3300 ft. of water line.
- (b) The existing sanitary sewage system is in marginal compliance with the State of Washington regulations and will not be in compliance with the state of Washington proposed guidelines. Sanitary sewage is presently processed through septic tanks, which are overloaded.
- (c) \$2,060,000 is requested for FY 1989 funding. Construction will start late in FY 1988, and will continue in FY 1989.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 88-R-812 Hazardous Waste Handling Facility	Project TEC: \$ 4,650
Lawrence Berkeley Laboratory (LBL)	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	\$ 500	\$ 500	\$ 350
1989	3,950	3,950	1,610
1990	200	200	2,065
1991	0	0	625

3. Narrative:

- (a) This project will provide a remote site for hazardous waste (i.e. radioactive transuranic elements, toxic liquid chemicals and toxic gases) handling. Construction will include a 12,300 gross sq. ft. building and an adjacent handling area.
- (b) 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 its current location, the facility is in close proximity to large laboratory and off-site personnel as well as main traffic routes. Relocating the facility to a remote site would minimize health and safety effects from a potential release.
- (c) \$3,950,000 is requested for FY 1989 funding. Construction will begin this year.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIOANL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 88-R-809 Plant Modifications to Comply with EPA Requirements      Project TEC: \$ 1,820  
 Argonne National Laboratory (ANL)      Start Date: FY 1988  
 Argonne, Illinois      Completion Date: FY 1990

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 820	\$ 820	\$ 600
1989	1,000	1,000	880
1990	0	0	340

3. Narrative:

- (a) This project is in two parts: (1) a new treatment facility will collect and neutralize coal pile run-off before discharging to a local creek and (2) rerouting rainwater runoff to the existing lime sludge pond to prevent reflooding of the pond and subsequent effluent discharge.
- (b) Currently coal pile run-off entering local creeks exceeds Environmental Protection Agency (EPA) effluent limitations for sulfuric acid and other metals. Continuous effluent discharges from the sludge pond (lime) are polluting neighboring creeks; this situation has been cited by EPA and the Illinois Environmental Protection Agency (IEPA). This project is needed to comply with regulatory requirements.
- (c) \$1,000,000 is requested for FY 1989 funding. Construction will be ongoing in FY 1989.

DEPARTMENT OF ENERGY  
FY 1989 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
(dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

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

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 350	\$ 350	\$ 350
1989	2,150	2,150	1,650
1990	2,000	2,000	2,490
1991	560	560	560

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) \$2,150,000 is requested for FY 1989 funding. The funding will be used for procurement of a contract consultant to complete design and engineering work. Procurement of equipment requiring long-lead time (i.e. 12 months or more) will be initiated.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

**IV. B. Plant Funded Construction Project**

1. Project title and location: 88-R-806 Environmental Health & Safety Project  
 Lawrence Berkeley Laboratory  
 Berkeley, California

Project TEC: \$10,325  
 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	\$ 850	\$ 850	\$ 550
1989	3,448	3,448	3,284
1990	3,250	3,250	3,038
1991	2,777	2,777	3,453

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) \$3,448,000 is requested for FY 1989 funding. Construction will begin this year.

DEPARTMENT OF ENERGY  
FY 1989 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
(dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

- |   |  |
|---|--|
| 1. Project title and location: 88-R-805 Environmental Improvements<br>Brookhaven National Laboratory (BNL)<br>Upton, New York | Project TEC: \$ 4,000<br>Start Date: FY 1988<br>Completion Date: FY 1991 |
|---|--|

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 565	\$ 565	\$ 560
1989	1,946	1,946	1,800
1990	1,489	1,489	1,000
1991	0	0	640

3. Narrative:

- (a) Twelve buildings will be connected to the central sanitary sewage system. Construction will include new piping and lift stations. Four buildings will have asbestos insulation removed from duct, piping and equipment and then disposed in a safe and environmentally approved manner. All exposed areas will be re-insulated.
- (b) This project is needed to comply with existing and expected Environmental Protection Agency, Occupational, Safety and Health Act and State Agency regulations and requirements.
- (c) \$1,946,000 is requested for FY 1989 funding. Construction will begin this year.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

- |                                |  |              |                          |
|--------------------------------|--|--------------|--------------------------|
| 1. Project title and location: | 88-R-804 Building Piping Systems Upgrade | Project TEC: | \$ 1,850                 |
|                                | Oak Ridge National Laboratory            |              | Start Date: FY 1988      |
|                                | Oak Ridge, Tennessee                     |              | Completion Date: FY 1990 |

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 520	\$ 520	\$ 265
1989	1,330	1,330	1,170
1990	0	0	415

3. Narrative:

- (a) This project upgrades or replaces piping and major system components of several critical piping systems including, steam supply, condensate return, process and potable water, cooling tower water, demineralized water, instrument air and natural gas. Existing cooling towers will also be replaced.
- (b) Most of the existing piping systems were constructed during World War II, with no systematic upgrading since. The existing systems have become inefficient, unreliable and in some cases only partially operable. Pipe ruptures have become more frequent, interrupting operations and causing delays.
- (c) \$1,330,000 is requested for FY 1989 funding. Construction will be ongoing in FY 1989.



DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 88-R-802 Multiprogram Laboratory Building Rehabilitation      Project TEC: \$ 1,900  
 Brookhaven National Laboratory (BNL)      Start Date: FY 1988  
 Upton, New York      Completion Date: FY 1989

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 455	\$ 455	\$ 455
1989	1,445	1,445	1,445

3. Narrative:

- (a) This project will rehabilitate portions of a late 1940's vintage multiprogram laboratory building. The roof will be replaced with a state-of-the-art insulation-roof membrane system. Offices will be rehabilitated to include suspended acoustic ceilings, lighting, floor finishes and environmental systems. Window units will be replaced with energy efficient ones that use double paned glass. Four bathrooms will be rehabilitated to conform to current standards. Two major greenhouses, attached to the building, will be reglazed.
- (b) The current building flat roof floods and then leaks during rains and snows. The building is uninsulated. The existing offices and bathrooms are substandard. The existing condition of the greenhouse glazing is unsatisfactory for adequate research due to air and water leakage.
- (c) \$1,445,000 is requested for FY 1989 funding. Construction will be completed in FY 1989.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 87-R-758 Rehabilitate Mechanical Utilities      Project TEC: \$ 5,500  
 Lawrence Berkeley Laboratory (LBL)      Start Date: FY 1987  
 Berkeley, California      Completion Date: FY 1990

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1987	\$ 915	\$ 915	\$ 83
1988	3,000	3,000	1,100
1989	1,585	1,585	2,580
1990	0	0	1,737

3. Narrative:

- (a) This project will upgrade the most deficient sections of key mechanical utilities including domestic water mains, central compressed air plant, natural gas mains and cooling towers.
- (b) The portions of the utility systems that will be replaced are approximately 40 years old. Maintenance costs have become excessive and service interruptions frequent. Most systems do not meet applicable codes and standards.
- (c) \$1,585,000 is requested for FY 1989 funding. Construction will be ongoing in FY 1989.

DEPARTMENT OF ENERGY  
FY 1989 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
(dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 87-R-757 Electrical System Rehabilitation  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California
- Project TEC: \$ 2,600  
Start Date: FY 1987  
Completion Date: FY 1989

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1987	\$ 300	\$ 300	\$ 3
1988	1,840	1,840	1,780
1989	460	460	817

3. Narrative:

- (a) This project will rehabilitate the 12kV main substation of LBL's power distribution system. Rehabilitation will include replacing six existing air circuit breakers, adding incoming line breakers, replacing one existing tie switch, adding feeder breakers and installing a data acquisition system for monitoring energy usage.
- (b) The existing 12kV main substation does not meet current National Electrical Code safety requirements. This project will correct the existing deficiencies.
- (c) \$460,000 is requested for FY 1989 funding. Construction and inspection will be completed in FY 1989.

DEPARTMENT OF ENERGY  
FY 1989 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
(dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 87-R-756 Water Line Replacement  
Argonne National Laboratory (ANL)  
Argonne, Illinois

Project TEC: \$ 5,200  
Start Date: FY 1987  
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	1,500	1,500	1,400
1989	3,134	3,134	2,000
1990	0	0	1,662

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 corrosions 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) \$3,134,000 is requested for FY 1989 funding. Construction will be ongoing in FY 1989.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 87-R-755 Mechanical System Rehabilitation  
 Argonne National Laboratory (ANL)  
 Argonne, Illinois
- Project TEC: \$ 3,200  
 Start Date: FY 1987  
 Completion Date: FY 1989

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1987	\$ 600	\$ 600	\$ 99
1988	2,100	2,100	1,590
1989	500	500	1,511

3. Narrative:

- (a) This project will restore worn parts of the central heating, ventilation and air conditioning systems in three large office and laboratory buildings. Restored parts will include chilled water coils, preheat coils, filters and packaged air handling units.
- (b) The existing units are 25 to 35 years old and have reached the end of their expected life. The systems are no longer reliable and maintenance has become costly and time consuming.
- (c) \$500,000 is requested for FY 1989 funding. Construction will be completed in FY 1989.

DEPARTMENT OF ENERGY  
FY 1989 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
(dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

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

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1987	\$ 1,235	\$ 1,235	\$ 521
1988	3,600	3,600	2,000
1989	3,600	3,600	4,100
1990	3,600	3,600	3,065
1991	0	0	2,349

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) \$3,600,000 is requested for FY 1989 funding. Construction will be ongoing.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 87-R-752 Piping System Restoration	Project TEC: \$ 3,800
Oak Ridge National Laboratory (ORNL)	Start Date: FY 1987
Oak Ridge, Tennessee	Completion Date: FY 1989

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1987	\$ 725	\$ 725	\$ 295
1988	2,475	2,475	1,855
1989	600	600	1,650

3. Narrative:

- (a) This project will replace, refurbish or upgrade utility piping distribution systems serving ORNL buildings in the Y-12 Plant, including steam cooling tower water, demineralized water and instrument air.
- (b) The purpose of this project is to restore critical utilities supporting the ORNL facilities located at the Y-12 Plant to an appropriate level of reliability and capacity.
- (c) \$600,000 is requested for FY 1989 funding. Construction will be completed in FY 1989.

DEPARTMENT OF ENERGY  
FY 1989 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
(dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 86-R-726 Fire Protection Improvements (Phase II) Project TEC: \$ 3,000  
Brookhaven National Laboratory (BNL) Start Date: FY 1986  
Upton, New York Completion Date: FY 1989

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1986	\$ 481	\$ 481	\$ 127
1987	1,680	1,680	486
1988	375	375	1,119
1989	464	464	1,268

3. Narrative:

- (a) This project provides for the design, fabrication and installation of fire improvements including automatic sprinklers, transferring the existing fire alarm panels to a multiplexed central alarm station and installing localized fire extinguishing systems.
- (b) The purpose of this project is to reduce the risk of loss due to fire at BNL. The project will bring BNL into compliance with DOE requirements.
- (c) \$464,000 is requested for FY 1989 funding. Construction will be completed in FY 1989.



DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 85-R-707 Hanford Site Fire Alarm System Upgrade  
 Richland, Washington
- Project TEC: \$ 4,850  
 Start Date: FY 1985  
 Completion Date: FY 1989

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 1,300	\$ 1,300	\$ 91
1986	1,708	1,708	707
1987	892	892	2,504
1988	575	575	687
1989	375	375	861

3. Narrative:

- (a) This project will provide an upgraded fire alarm system for the Hanford site. The project will replace all existing master alarm boxes and street boxes with radio boxes, replace alarm receiving equipment, replace/upgrade existing auxiliary fire protection system, and provide a computer aided dispatch system.
- (b) The purpose of this project is to update the existing fire alarm system with a more reliable and efficient system. The existing system is 30 to 40 years old. Due to deterioration the system is malfunctioning (false and nuisance alarms).
- (c) \$375,000 is requested for FY 1989 funding. Construction and inspection will be completed during FY 1989.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

IV. B. Plant Funded Construction Project

- |  |                          |
|--|--------------------------|
| 1. Project title and location: 85-R-706 Medical Facility | Project TEC: \$ 7,300    |
| Lawrence Livermore National Laboratory (LLNL)            | Start Date: FY 1985      |
| Livermore, California                                    | Completion Date: FY 1989 |

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 500	\$ 500	\$ 196
1986	2,694	2,694	338
1987	3,644	3,644	2,374
1988	150	150	1,662
1989	312	312	630
1990	0	0	2,100

3. Narrative:

- (a) This project will provide a 25,600 gross square foot building for a new and expanded facility for health services and will house all of the 32 medical staff and support personnel. The new facility will have special facilities for isolation and treatment of casualties from accidents involving hazardous materials.
- (b) The current health facility is housed in a 40 year old building (originally a World War II barracks) that is inadequate for housing medical staff and equipment necessary to serve a laboratory staff of 7600 employees. The existing facility does not meet code standards nor is it generally capable of handling a large variety of emergency situations.
- (c) \$312,000 is requested for FY 1989 funding. Project construction will be ongoing during the year, and completed in FY 1990.

DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIOANL BUDGET REQUEST  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - 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	3,122	3,960
1988	470	470	705
1989	490	490	941
1990	446	446	311

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) \$490,000 is requested for FY 1989 funding. Construction will be ongoing.

DEPARTMENT OF ENERGY  
 FY 1989 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: 89-R-770 General plant projects, Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee

Project TEC: \$ 2,500  
 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	\$2,500	\$2,500	\$625
1990	\$0	\$0	\$1,875

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 1989 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	\$ 2,400
1989	11,787	11,787	8,100
1990	10,500	10,500	17,600
1991	7,913	7,913	6,900

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) \$11,787,000 is requested for FY 1989 funding. This will be the second year of funding. The Architect/Engineering contract negotiation will be complete. Procurement and construction will be underway.

DEPARTMENT OF ENERGY  
FY 1989 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY RESEARCH AND DEVELOPMENT  
(dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
Environmental Compliance

IV. 8. Plant Funded Construction Project

1. Project title and location: 86-R-801 Non-Radiological Process Waste Treatment  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee

Project TEC: \$18,000  
Start Date: FY 1986  
Completion Date: FY 1990

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1986	\$ 2,887	\$ 2,887	\$ 1,552
1987	7,000	7,000	2,767
1988	7,000	7,000	7,148
1989	1,113	1,113	4,300
1990	0	0	2,233

3. Narrative:

- (a) This project will bring the existing non-radiological process waste system into compliance with environmental regulations. It includes tonage to replace surface impoundments, pumps and piping to transfer wastewater and, improved processes for removing wastes from process waste water streams and for handling resultant solid wastes. In some instances, process wastes will be treated where they are generated rather than piping them to a central location.
- (b) This project is needed to resolve the major Clean Water Act concerns at ORNL with respect to the discharge of non-radiological process wastewater and to eliminate the discharge of hazardous wastewater into surface impoundments by November 8, 1988, in compliance with provisions of the Reauthorized Resource Conservation and Recovery Act (RCRA).
- (c) \$1,113,000, is requested for FY 1989 funding. This is the last year of this project funding. Construction will be completed in FY 1990.

# Congressional Budget Request

Non-Defense Activities  
Construction Project Data Sheets

**FY 1989**



**U.S. Department of Energy**


Assistant Secretary,  
Management and Administration  
Office of the Controller  
Washington, D.C. 20585

February 1988



DEPARTMENT OF ENERGY  
FISCAL YEAR 1989 CONGRESSIONAL BUDGET REQUEST  
CONSTRUCTION PROJECT DATA SHEETS  
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BASIC RESEARCH USER FACILITIES  
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NON-DEFENSE CONSTRUCTION PROJECT DATA SHEETS

ENERGY SUPPLY RESEARCH AND DEVELOPMENT

DEPARTMENT OF ENERGY  
FISCAL YEAR 1989 CONGRESSIONAL BUDGET REQUEST  
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DEPARTMENT OF ENERGY  
 1989 CONGRESSIONAL BUDGET REQUEST  
 CONSTRUCTION PROJECT DATA SHEETS  
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 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<br>Brookhaven National Laboratory (BNL)<br>Upton, New York | 2. Project No. 89-R-113   |
| 3. Date A-E initiated: 2nd Qtr. FY 1989   | 5. Previous cost estimate: None<br>Date: None   |
| 3a. Date physical construction starts: 1st Qtr. FY 1990   | 6. Current cost estimate: \$ 9,600<br>Less amount for PE&D: 0<br>Net cost estimate: \$ 9,600<br>Date: December 1987 |
| 4. Date construction ends: 3rd 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	6,800	6,800	6,000
	1991	0	1,300	1,300	2,000
	1992	0	0	0	600

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

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- |   |                         |
|---|-------------------------|
| 1. Title and location of project: Environmental upgrades<br>Brookhaven National Laboratory (BNL)<br>Upton, New York | 2. Project No. 89-R-113 |
|---|-------------------------|
- 

### 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

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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 its 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

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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	
c. Contingency on the above costs @ approximately 15%.....		<u>1,248</u>
Total.....		\$ 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.

CONSTRUCTION PROJECT DATA SHEETS

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

	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>Total</u>
a. Total Project Funding (actual year \$)					
1. Total construction costs.....	\$ 1,000	\$ 6,000	\$ 2,000	\$ 600	\$ 9,600
2. Other Project Funding.....	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Project Funding.....	\$ 1,000	\$ 6,000	\$ 2,000	\$ 600	\$ 9,600
b. Other Related Funding Requirements - None					

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

- a. Total Project Funding - explained in Items 8, 9, and 10.
- b. Other Related Funding Requirements - None

Although some continuing costs, most notably those of environmental monitoring, would appear to be related to this project they have not been specifically identified here in that such activities are an integral part of Brookhaven National Laboratory's programs in this area and, as such, will be performed independent of the existence of this project.



DEPARTMENT OF ENERGY  
1989 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<br>Argonne National Laboratory (ANL)<br>Argonne, Illinois | 2. Project No.: 89-R-112  |
| 3. Date A-E work initiated: 1st Qtr. FY 1989<br><br>3a. Date physical construction starts: 3rd Qtr. FY 1989                 | 5. Previous cost estimate: None<br>Date:  |
| 4. Date construction ends: 4th Qtr. FY 1990   | 6. Current cost estimate: \$ 2,380<br>Less amount for PE&D:        0<br>Net cost estimate:            \$ 2,380<br>Date: December 1987 |

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

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1. Title and location of project: Replace PCB Filled Transformers Argonne National Laboratory (ANL) Argonne, Illinois	2. Project No.: 89-R-112
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### 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

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

2. Project No.: 89-R-112

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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 \*

	<u>Total Cost</u>
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  
1989 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,  
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 1990

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 1987

<u>7. Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1989	\$ 3,000	\$ 668	\$ 668	\$ 668
	1990	0	2,332	2,332	2,332

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

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

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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 ft<sup>2</sup> 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

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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 ft<sup>2</sup> 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<sup>a/</sup></u>
a. Engineering, design, and inspection at approximately 21% <sup>b/</sup> 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 <sup>c/</sup>		<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>

<sup>a/</sup> Based on completed conceptual design.

<sup>b/</sup> The high, relative percentage of engineering is for renovation work being done in nine separate buildings.

<sup>c/</sup> 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

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1. Title and location of project: Building Utilities, Phase I  
Pacific Northwest Laboratory (PNL)  
Richland, Washington
2. Project No.: 89-R-111
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11. 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.

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

Not required, project less than \$5 million.

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

Not required, project less than \$5 million.

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

- |  |   |
|--|---|
| 1. Title and location of project: Electrical systems upgrade<br>Oak Ridge National Laboratory (ORNL)<br>Oak Ridge, Tennessee | 2. Project No. 89-R-110   |
| 3. Date A-E initiated: 1st Quarter FY 1989   | 5. Previous cost estimate: None<br>Date: none   |
| 3a. Date physical construction starts: 4th Quarter FY 1989   | 6. Current cost estimate: \$2,200<br>Less amount for PE&D:        0<br>Net cost estimate:            \$2,200<br>Date: December 1987 |
| 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	\$ 2,200	\$ 854	\$ 854	\$ 200
	1990	0	1,346	1,346	1,100
	1991	0	0	0	900

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

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

2. Project No. 89-R-110

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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

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

2. Project No. 89-R-110

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10. Details of Cost Estimates\*

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at approximately 14% of construction costs, item b.....		\$ 235
b. Construction costs (outside utilities).....		<u>1,713</u>
Subtotal.....		1,948
c. Contingency @ 13% of above costs.....		<u>252</u>
Total.....		\$ 2,200

\*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.

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.

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

1. Title and location of project: Measurements and controls support facility 2. Project No. 89-R-109  
 Oak Ridge National Laboratory (ORNL)  
 Oak Ridge, Tennessee

3. Date A-E initiated: 1st Quarter FY 1989 5. Previous cost estimate: None  
 Date: none  
 3a. Date physical construction starts: 1st Quarter FY 1990 6. Current cost estimate: \$4,200  
 Less amount for PE&D: 0  
 4. Date construction end: 3rd Quarter FY 1991 Net cost estimate: \$4,200  
 Date: December 1987

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1989	\$ 4,200	\$ 1,100	\$ 1,100	\$ 965
	1990	0	3,100	3,100	1,400
	1991	0	0	0	1,835

8. Brief Physical Description of Project

The proposed project will construct a two-story building providing approximately 20,000 sq. ft. as a replacement for 1943 deteriorated wooden structure on the same site. It will contain offices, testing areas for instrumentation and automation systems, process instrument shops, industrial hygiene support laboratories, and service areas for utilities, power and other building operations support systems.

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

## CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Measurements and controls support facility Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee	2. Project No. 89-R-109
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### 8. Brief Physical Description of Project (continued)

Laboratory rooms will be provided for industrial hygiene associated activities. 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 environmental control systems and raised floors appropriate to the requirements of the equipment.

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

Overhead cable trays will be provided for communications and instrumentation cabling between the test areas and offices. Broadband communications capability will be provided throughout the building and a public address (PA) system and telephone system will be installed. Signal cable conduits will be provided from the proposed building to three adjacent buildings.

Site improvements include the demolition and disposal of the existing wooden building, 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 initiation of demolition and disposal of the building occupying the Measurements and Controls Support Facility (MCSF) site.

### 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 in the Oak Ridge National Laboratory (ORNL) complex. The wooden building to be replaced by the Measurements and Controls Support Facility (MCSF) is contaminated from its former use as a laboratory and is grossly inadequate for current and projected needs. Because of its wartime construction (1943), it requires excessive maintenance.

## CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Measurements and controls support facility      2. Project No. 89-R-109  
Oak Ridge National Laboratory (ORNL)  
Oak Ridge, Tennessee

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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 the inadequate, deteriorated, contaminated building cannot be cost-effectively accomplished.
- b. Major losses in productivity due to the currently inadequate housing and space for the proposed MCSF occupants represents a penalty to the ORNL operating costs.
- c. The most cost-effective location for adequate long-term housing for Instruments and Controls, Industrial Hygiene, and Environmental and Occupational Safety is the site occupied by the deteriorated wooden building.

The MCSF will house personnel from Instruments and Controls, Industrial Hygiene, and Environmental and Occupational Safety. The support function responsibilities for all of these organizations are interrelated through a mutual need for a central location. The proposed MCSF will provide adequate space to accommodate the support personnel now located in the existing building and in other ORNL locations. The proposed location of the MCSF provides for timely, efficient, and interactive response from the support organizations.

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. 89-R-109  
Oak Ridge National Laboratory (ORNL)  
Oak Ridge, Tennessee
- 

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

Alternate 2: Rehabilitate the existing building to provide adequate long-term space and facilities. This alternative was assessed, and a rehabilitation cost of approximately \$4,000,000 was indicated to provide only 60% of the space which would be available in the MCSF, leaving a required space deficit.

Alternate 3: 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 4: 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.

Estimated Incremental Operating Costs for MCSF:

The estimated incremental operating cost for the MCSF, derived from a comparison of costs for the existing deteriorated building with costs for buildings similar in construction to the MCSF, indicates an annual saving of approximately \$50,000 for utilities and maintenance.



CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Measurements and controls support facility      2. Project No. 89-R-109  
 Oak Ridge National Laboratory (ORNL)  
 Oak Ridge, Tennessee

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.....		\$ 470
b. Construction costs (outside utilities).....		2,640
(1) Improvements to land.....	\$ 20	
(2) Building costs, approx. 20,000 sq. ft. @ approx. \$105/sf..	2,100	
(3) Outside utilities.....	240	
(4) Special facilities.....	280	
c. Removal cost less salvage:		
(1) Demolition of existing building, acceptable disposal of scrap and spoils, and site restoration.....		490
Subtotal.....		<u>3,600</u>
d. Contingency @ 17% of above costs.....		600
Total.....		<u>\$ 4,200</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 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.

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.

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

- |  |   |
|--|---|
| 1. Title and location of project: Road safety improvements<br>Oak Ridge National Laboratory (ORNL)<br>Oak Ridge, Tennessee | 2. Project No. 89-R-108   |
| 3. Date A-E initiated: 1st Quarter FY 1989   | 5. Previous cost estimate: None<br>Date: none   |
| 3a. Date physical construction starts: 4th Quarter FY 1989   | 6. Current cost estimate: \$2,520<br>Less amount for PE&D:        0<br>Net cost estimate:            \$2,520<br>Date: December 1987 |
| 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	\$ 2,520	\$ 2,520	\$ 400
	1990	0	0	0	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

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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

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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.

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.

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 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- |   |   |
|---|---|
| 1. Title and location of project: Original Labsite Substation<br>Lawrence Berkeley Laboratory (LBL)<br>Berkeley, California | 2. Project No.: 89-R-107  |
| 3. Date A-E work initiated: 3rd Qtr. FY 1989<br><br>3a. Date physical construction starts: 4th Qtr. FY 1990                 | 5. Previous cost estimate: None<br>Date:  |
| 4. Date construction ends: 4th Qtr. FY 1991   | 6. Current cost estimate: \$ 2,800<br>Less amount for PE&D: 0<br>Net cost estimate: \$ 2,800<br>Date: December 1987 |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1989	\$ 2,800	\$ 250	\$ 250	\$ 150
	1990	0	2,550	2,550	780
	1991	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.: 89-R-107

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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.: 89-R-107
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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.....		\$ 309
b. Construction.....		2,081
(1) Improvements to land.....	\$ 48	
(2) Utilities.....	1,010	
(3) Special facilities.....	1,023	
Subtotal.....		2,390
e. Contingency @ approx. 17%.....		410
Total estimated cost.....		\$2,800

\* Construction costs have been escalated at 1986 - 1.1%; 1987 - 2.5%; for 1988 - 4.0% for 1989 - 4.8%; for 1990 - 5.3%, for 1991 - 5.6%, compounded to midpoint of construction, October 1990, for a total of 20.5%. 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.

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.

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 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- |   |   |
|---|---|
| 1. Title and location of project: Instrumentation Support Laboratory<br>Rehabilitation - Building 70A<br>Lawrence Berkeley Laboratory (LBL)<br>Berkeley, California | 2. Project No.: 89-R-106  |
| 3. Date A-E work initiated: 2nd Qtr. FY 1989<br><br>3a. Date physical construction starts: 3rd Qtr. FY 1990<br><br>4. Date construction ends: 3rd Qtr. FY 1991      | 5. Previous cost estimate: None<br>Date:<br><br>6. Current cost estimate: \$ 1,900<br>Less amount for PE&D:       0<br>Net cost estimate:       \$ 1,900<br>Date: December 1987 |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1989	\$ 1,900	\$ 200	\$ 200	\$ 110
	1990	0	1,700	1,700	990
	1991	0	0	0	800

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.: 89-R-106

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.....		\$ 240
b. Construction.....		1,265
(1) Improvements to land.....	\$ 0	
(2) Buildings.....	1,085	
(3) Special facilities.....	180	
(4) Utilities.....	0	
c. Standard equipment.....		10
d. Demolition and removals.....		50
Subtotal.....		<u>1,565</u>
e. Contingency @ approx. 21%.....		335
Total estimated cost.....		<u>\$1,900</u>

\* Construction costs have been escalated at 1986 - 1.1%; 1987 - 2.5%; for 1988 - 4.0% for 1989 - 4.8%; for 1990 - 5.3%, compounded to midpoint of construction, October 1990, for a total of 18.5%. Conceptual design is complete.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Instrumentation Support Laboratory Rehabilitation - Building 70A Lawrence Berkeley Laboratory (LBL) Berkeley, California	2. Project No.: 89-R-106
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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.

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.

DEPARTMENT OF ENERGY  
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 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- |  |   |
|--|---|
| 1. Title and location of project: Building addition<br>Brookhaven National Laboratory (BNL)<br>Upton, New York | 2. Project No. 89-R-105   |
| 3. Date A-E initiated: 1st Quarter FY 1989   | 5. Previous cost estimate: None<br>Date: none   |
| 3a. Date physical construction starts: 3rd Quarter FY 1989   | 6. Current cost estimate: \$1,625<br>Less amount for PE&D: <u>0</u><br>Net cost estimate: <u>\$1,625</u><br>Date: December 1987 |
| 4. Date construction end: 4th Quarter FY 1990  |   |

<u>7. Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1989	\$ 1,625	\$ 1,625	\$ 1,625	\$ 800
	1990	0	0	0	825

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

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1. Title and location of project: Building addition Brookhaven National Laboratory (BNL) Upton, New York	2. Project No. 89-R-105
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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

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

2. Project No. 89-R-105

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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

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1. Title and location of project: Building addition Brookhaven National Laboratory (BNL) Upton, New York	2. Project No. 89-R-105
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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. 89-R-105

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.....		\$ 151
b. Construction costs.....		1,264
(1) Improvements to land.....	\$ 10	
(2) New space construction (office, training, lab and equipment space) (12,500 s.f. @ \$99.50).....	1,244	
(3) Utilities including electrical power, water, steam and sanitary sewers.....	10	

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Building addition Brookhaven National Laboratory (BNL) Upton, New York	2. Project No. 89-R-105
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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)...		35
Subtotal.....		\$ 1,450
d. Contingency @ approximately 12% of above costs.....		175
Total.....		\$ 1,625

\*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.

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.



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 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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

2. Project No. 89-R-104

3. Date A-E initiated: 1st Quarter FY 1989

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

4. Date construction end: 3rd Quarter FY 1990

5. Previous cost estimate: None  
 Date: none

6. Current cost estimate: \$1,600  
 Less amount for PE&D: 0  
 Net cost estimate: \$1,600  
 Date: December 1987

<u>7. Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1989	\$ 1,600	\$ 300	\$ 300	\$ 300
	1990	0	1,300	1,300	1,300

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. 89-R-104

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. 89-R-104

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

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

2. Project No. 89-R-104

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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. 89-R-104

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.

$$\$334.975 \times 1/15 = \$385.221 \text{ in FY 1988 dollars}$$

$$\text{Payback on investment} = \frac{1,600,000}{385,221} = 4.15 \text{ years}$$

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.....		\$ 130
b. Construction costs.....		1,324
(1) Improvements to land.....	\$ 44	
(2) New addition (11,400 sq. ft. @ \$84.21).....	960	
(3) Demolition.....	10	
(4) Special equipment, 2 cranes (1 @ 10T, 1 @ 20T).....	310	
Subtotal.....		<u>1,454</u>
c. Contingency @ approximately 10% of above costs.....		146
Total.....		<u>\$ 1,600</u>

\*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%,

CONSTRUCTION PROJECT DATA SHEETS

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

2. Project No. 89-R-104

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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.

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.

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

- |   |   |
|---|---|
| 1. Title and location of project: Boiler replacement<br>Brookhaven National Laboratory (BNL)<br>Upton, New York | 2. Project No. 89-R-103   |
| 3. Date A-E initiated: 2nd Quarter FY 1989  | 5. Previous cost estimate: None<br>Date: none   |
| 3a. Date physical construction starts: 2nd Quarter FY 1990  | 6. Current cost estimate: \$3,350<br>Less amount for PE&D:     0<br>Net cost estimate:     \$3,350<br>Date: December 1987 |
| 4. Date construction end: 2nd 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	\$ 3,350	\$ 409	\$ 409	\$ 200
	1990	0	2,941	2,941	600
	1991	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

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

2. Project No. 89-R-103

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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

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

2. Project No. 89-R-103

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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.....		\$ 358
b. Installation costs.....		2,555
Boiler.....	\$1,920	
Boiler accessories.....	60	
Boiler plant modifications.....	140	
Mechanical work.....	338	
Electrical work.....	97	
Subtotal.....		<u>2,913</u>
c. Contingency @ 15% of above costs.....		<u>437</u>
Total.....		\$ 3,350

\*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.

CONSTRUCTION PROJECT DATA SHEET

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

2. Project No. 89-R-103

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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.

DEPARTMENT OF ENERGY  
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CONSTRUCTION PROJECT DATA SHEETS  
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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)<br>Brookhaven National Laboratory (BNL)<br>Upton, New York | 2. Project No. 89-R-102   |
| 3. Date A-E initiated: 2nd Quarter FY 1989  | 5. Previous cost estimate: None<br>Date: none   |
| 3a. Date physical construction starts: 1st Quarter FY 1990  | 6. Current cost estimate: \$3,000<br>Less amount for PE&D: 0<br>Net cost estimate: \$3,000<br>Date: December 1987 |
| 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
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8. Brief Physical Description of Project (continued)

Extent of

<u>Building No.</u>	<u>Title</u>	<u>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	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

8. Brief Physical Description of Project (continued)

Extent of

<u>Building No.</u>	<u>Title</u>	<u>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)      2. Project No. 89-R-102  
 Brookhaven National Laboratory (BNL)  
 Upton, New York

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)<br>Brookhaven National Laboratory (BNL)<br>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.

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.

DEPARTMENT OF ENERGY  
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MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- |   |  |
|---|--|
| 1. Title and location of project: Rehabilitation of Domestic & Firewater,<br>Pumping & Storage System<br>Argonne National Laboratory (ANL)<br>Argonne, Illinois | 2. Project No.: 89-R-101   |
| 3. Date A-E work initiated: 1st Qtr. FY 1989<br><br>3a. Date physical construction starts: 4th Qtr. FY 1989<br><br>4. Date construction ends: 4th Qtr. FY 1990  | 5. Previous cost estimate: None<br>Date:   |
|   | 6. Current cost estimate: \$ 1,590<br>Less amount for PE&D: <u>0</u><br>Net cost estimate: \$ 1,590<br>Date: December 1987 |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1989	\$ 1,590	\$ 150	\$ 150	\$ 150
	1990	0	1,440	1,440	1,440

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

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

2. Project No.: 89-R-101

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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

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

2. Project No.: 89-R-101

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<u>10. Details of Cost Estimate *</u>	<u>Total Cost</u>
a. Engineering, design and inspection 12% of b .....	\$ 142
b. Construction.....	1,182
Subtotal.....	1,324
c. Contingency @ 20% of above costs.....	266
Total estimated project cost.....	<u>\$1,590</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.

DEPARTMENT OF ENERGY  
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 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- |   |  |
|---|--|
| 1. Title and location of project: Transportation Facility Replacement<br>Argonne National Laboratory (ANL)<br>Argonne, Illinois | 2. Project No.: 89-R-100   |
| 3. Date A-E work initiated: 1st Qtr. FY 1989<br><br>3a. Date physical construction starts: 3rd Qtr. FY 1989                     | 5. Previous cost estimate: None<br>Date:   |
| 4. Date construction ends: 1st Qtr. FY 1991   | 6. Current cost estimate: \$ 3,890<br>Less amount for PE&D: <u>0</u><br>Net cost estimate: \$ 3,890<br>Date: December 1987 |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1989	\$ 3,890	\$ 350	\$ 350	\$ 150
	1990	0	1,270	1,270	1,470
	1991	0	2,270	2,270	2,270

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

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1. Title and location of project: Transportation Facility Replacement  
Argonne National Laboratory (ANL)  
Argonne, Illinois
2. Project No.: 89-R-100
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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

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

2. Project No.: 89-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

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

2. Project No.: 89-R-100

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

The Energy Costs 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

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

2. Project No.: 89-R-100

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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

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

2. Project No.: 89-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.....		\$ 363
b. Construction.....		3,022
(1) Site Work.....	\$ 547	
(2) Building (30,000 sq. ft. at approx. \$70/sq. ft.).....	2,104	
(3) Utilities.....	371	
		<hr/>
Subtotal.....		3,385
c. Contingency @ 15% of above costs.....		505
Total estimated project cost.....		<hr/> \$3,890

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



CONSTRUCTION PROJECT DATA SHEETS

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- |   |                          |
|---|--------------------------|
| 1. Title and location of project: Transportation Facility Replacement<br>Argonne National Laboratory (ANL)<br>Argonne, Illinois | 2. Project No.: 89-R-100 |
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11. Method of Performance

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

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.

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 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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|--|--|
| 1. Title and location of project: Multiprogram laboratory building rehabilitation<br>Brookhaven National Laboratory (BNL)<br>Upton, N.Y. | 2. Project No.: 88-R-802   |
| 3. Date A-E work initiated: 1st Qtr. FY 1988<br><br>3a. Date physical construction starts: 2nd Qtr. FY 1988                              | 5. Previous cost estimate: None<br>Date:   |
| 4. Date construction ends: 3rd Qtr. FY 1989  | 6. Current cost estimate: \$ 1,900<br>Less amount for PE&D: <u>0</u><br>Net cost estimate: \$ 1,900<br>Date: December 1987 |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1988	\$ 1,900	\$ 455	\$ 455	\$ 455
	1989	0	1,445	1,445	1,445

8. Brief Physical Description of Project

The project will include modifications to and rehabilitation of some of the oldest portions of the Laboratory's Biology building. The present building complex was constructed in three phases. Phase I was a World War II masonry Army Post Exchange (PX) building built in 1945 and converted for laboratory use in 1949; Phase II was a new masonry addition similar to Phase I and was constructed in 1952; and Phase III, the "new" wing, was constructed in 1961. The project includes the complete removal and replacement of the roofing system and insulation over Phases I and II. Included will be the complete rehabilitation of both 1949 vintage greenhouses, the upgrading of bathrooms and 21 offices. All of these portions are, at best substandard.

## CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Multiprogram laboratory building rehabilitation Brookhaven National Laboratory (BNL) Upton, N.Y.	2. Project No.: 88-R-802
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### 8. Brief Physical Description of Project (continued)

The roof replacement will be extremely difficult due to the myriad of mechanical equipment and support structures, the multitude of roof penetrations, and the extent of decayed and saturated insulation. The conceptual design process has examined all possible solutions, including the construction of a superimposed penthouse. It is presently expected that a state-of-the-art insulation-roof membrane system will be installed which will require minimum interruptions to operations due to temporary relocations of equipment.

Four bathrooms will be gutted and rehabilitated. New ceramic tile finishes and plumbing fixtures will be installed in conformance to current standards. Twenty-one substandard offices will be rehabilitated to include suspended acoustic ceilings, lighting, floor finishes and environmental systems. Sash also will be replaced with non-ferrous type energy efficient insulated glass.

The two major existing greenhouses will be detoxified, and reglazed. Their structural components, vents, mechanisms, and other defective parts will all be repaired or replaced. Finally, both greenhouses will be painted.

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

For the past 25 years, the Laboratory has allocated General Plant Projects funding and operating funds to upgrade, maintain and convert many of the 58 laboratories in the two older portions of the Biology complex. A total of \$2,000,000 has been allocated in capital improvements in the past 8 years and over \$185,000 in operating funds have been spent for major maintenance upgrades for the entire building. Two trailers were acquired to supplement office space short falls and other stop-gap measures were taken to augment space needs. These include conversion of offices and/or cold boxes to laboratories or vice-versa as needed. Minimum funds have been available to rehabilitate other areas since programmatic facilities and mechanical systems must be maintained at a reasonable and safe level of operating efficiency.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Multiprogram laboratory building rehabilitation  
Brookhaven National Laboratory (BNL)  
Upton, N.Y.

2. Project No.: 88-R-802

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

Roof flooding is commonplace, the freeze-thaw process in winter is the worst cause of leaks, and the lack of drains at low points all cause inconvenience and damage to the spaces and equipment below. Twenty-one undersized, overcrowded and generally miserable offices in the original PX building will be rehabilitated as best as possible to provide the scientific staff with a much improved and attractive place to work even though the spaces will continue to be substantially undersized.

Although seemingly costly, these effects will be cost effective not only by saving the previous capital investments but by creating an environment that will be more attractive when recruiting and retaining first class investigators to do research on important DOE missions.

<u>10. Details of Cost Estimate *</u>	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection 15% of b .....		\$ 206
b. Construction.....		1,375
(1) Roofing and steel.....	\$ 605	
(2) Interior modifications.....	310	
(3) Greenhouses rehabilitation.....	460	
Subtotal.....		<u>1,581</u>
c. Contingency @ 20% of above costs.....		319
Total estimated cost.....		<u>\$1,900</u>

\* The estimate is based on conceptual design which is 100% complete.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Multiprogram laboratory building rehabilitation  
Brookhaven National Laboratory (BNL)  
Upton, N.Y.

2. Project No.: 88-R-802

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11. Method of Performance

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

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 (Tabular dollars in thousands. Narrative material in whole dollars.)

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|--|--|
| 1. Title and location of project: Building piping systems upgrade,<br>at Y-12<br>Oak Ridge National Laboratory (ORNL)<br>Oak Ridge, Tennessee                  | 2. Project No.: 88-R-804   |
| 3. Date A-E work initiated: 1st Qtr. FY 1988<br><br>3a. Date physical construction starts: 4th Qtr. FY 1989<br><br>4. Date construction ends: 2nd Qtr. FY 1990 | 5. Previous cost estimate: None<br>Date: none<br><br>6. Current cost estimate: \$ 1,850<br>Less amount for PE&D:        0<br>Net cost estimate:            \$ 1,850<br>Date: December 1987 |

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1988	\$1,850	\$ 520	\$ 520	\$ 265
	1989	0	1,330	1,330	1,170
	1990	0	0	0	415

8. Brief Physical Description of Project

This project is designed to upgrade or replace the most critical portions of the inadequate building piping systems serving Oak Ridge National Laboratory (ORNL) research facilities located in the Y-12 Plant. Those portions of the building piping systems not covered by this project will be addressed by specific building upgrade or replacement projects planned for later years.

## CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Building piping systems upgrade, at Y-12 Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee	2. Project No.: 88-R-804
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### 8. Brief Physical Description of Project (continued)

This project restores outdated and unreliable building utility distribution piping systems and deteriorated cooling towers. Existing cooling towers will be replaced with new towers of equivalent capacity. The piping systems that are no longer reasonably repairable and require replacement, include steam supply and condensate return, process and potable water, cooling tower water, demineralized water, instrument air, natural gas, and other similar systems. In addition, the work will include the systematic replacement and/or refurbishment of major system components such as pumps, traps, reducing stations, drainage systems, cooling towers, and main distribution headers (both inside and outside of buildings).

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

Four major ORNL activities (biological research, engineering technology research, fusion energy research and stable isotope production), with an annual operating budget in excess of \$75 million (FY 1985) are housed in ten large buildings and numerous ancillary ones at the Y-12 plant. The replacement value of these buildings (1.4 million sq. ft.) and the equipment they house is over \$500 million. These structures were constructed during World War II to house electromagnetical and chemical uranium enrichment processes. Since the war these buildings have been modified to accommodate the ORNL activities. These modifications utilized the existing building piping systems and provided little or no systematic upgrading over the years. Age, the compromises of war-time construction, and continued heavy use have rendered a number of critical piping systems seriously deficient. This project will address those areas with the highest probability and greatest impact of failure.

The systems being upgraded to meet ongoing requirements are basic to any research facility and would be required by any occupant. These include the steam and condensate system used for building heating, the potable water system used for domestic purposes, the process water system used for equipment cooling and other research purposes, the building and research functions. During their forty years of use these critical systems have become inefficient, unreliable, and in some cases only partially operable. Pipes rupture due to corrosion, valves have become inoperable due to deteriorated gates and plugs, and scaling (mineral build-up on pipe interiors) has reduced flow by 50 to 90 percent.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Building piping systems upgrade, at Y-12 Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee	2. Project No.: 88-R-804
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9. Purpose, Justification of Need for, and Scope of Project (continued)

As these piping systems continue to age and deteriorate, a marked increase in the frequency and severity of failure is expected. Many of the past and current failures have resulted in disruptions to normal activities measured in hours up to several days. The repair of these failures has exposed normally concealed portions of the system which show clear and convincing evidence of future more significant failures. These failures would be measured in days, weeks, or perhaps months. Such disruptions would have major adverse consequences resulting in major loss of personnel time (higher program cost), inability to meet program milestones, and in certain instances the loss of irreplaceable experimental data. The detailed cost impacts of these disruptions on laboratory activities is impossible to project since they depend on when, where, how often and for how long the disruption occurs. However, it can be said that minor disruptions involving few people would cost in the thousands to tens-of-thousands-of-dollars range, while major disruptions involving many people or loss of research could easily reach a cost of millions-of-dollars.

To avoid these significant and unacceptable consequences the system deficiencies have been critically evaluated to assess 1) the probability of an avoidable failure occurring and 2) the significance of its impact on the activities housed within the structure. In addition, ongoing costs and operational needs were considered. While the overall list of system deficiencies is very large and will ultimately require attention, only that portion which stood out as the urgent and compelling is included in this project.

<u>10. Details of Cost Estimate*</u>	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design, and inspection at approximately 19% of construction costs, item b. ....		\$ 250
b. Construction costs.....		1,340
(1) Building modifications.....	\$ 650	
(2) Outside Utilities.....	250	
(3) Other Structures.....	440	
Subtotal.....		1,590



CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Building piping systems upgrade, at Y-12 Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee	2. Project No.: 88-R-804
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10. Detail of Cost Estimate\* (continued)

c. Contingency at approximately 16% of above costs.....	260
Total project cost.....	\$1,850

\*The above estimates are based on a conceptual design report completed in February 1986 at a cost of \$30,000.

11. Method of Performance

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 awarded on the basis of competitive bids.

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

Not required because the total estimated cost is less than \$5,000,000.

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

Not required because the total estimated cost is less than \$5,000,000.

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 (Tabular dollars in thousands. Narrative material in whole dollars.)

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|---|--|
| 1. Title and location of project: Environmental improvements<br>Brookhaven National Laboratory (BNL)<br>Upton, New York | 2. Project No.: 88-R-805   |
| 3. Date A-E work initiated: 2nd Qtr. FY 1988  | 5. Previous cost estimate: None<br>Date: none  |
| 3a. Date physical construction starts: 4th Qtr. FY 1988   | 6. Current cost estimate: \$ 4,000<br>Less amount for PE&D: <u>0</u><br>Net cost estimate: \$ 4,000<br>Date: December 1987 |
| 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	\$ 560
	1989	0	1,946	1,946	1,800
	1990	0	1,489	1,489	1,000
	1991	0	0	0	640

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

CONSTRUCTION PROJECT DATA SHEETS

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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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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.

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

Not applicable.

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

Not applicable.

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 (Tabular dollars in thousands. Narrative material in whole dollars.)

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|---|---|
| 1. Title and location of project: Environmental health & safety project<br>Lawrence Berkeley Laboratory (LBL)<br>Berkeley, California | 2. Project No.: 88-R-806  |
| 3. Date A-E work initiated: 2nd Qtr. FY 1988  | 5. Previous cost estimate: None<br>Date:  |
| 3a. Date physical construction starts: 4th Qtr. FY 1988   | 6. Current cost estimate: \$10,325<br>Less amount for PE&D: 0<br>Net cost estimate: \$10,325<br>Date: December 1987 |
| 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	\$ 550
	1989	0	3,448	3,448	3,284
	1990	0	3,250	3,250	3,038
	1991	0	2,777	2,777	3,453

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

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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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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

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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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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

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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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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

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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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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

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

\* Conceptual design is complete.

11. Method of Performance

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

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

	<u>Prior Yrs.</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991</u>	<u>Total</u>
a. Total project costs						
1. Total facility costs						
(a) Construction line item..	\$ 0	\$ 550	\$ 3,284	\$ 3,038	\$ 3,453	\$10,325
Total direct costs.....	\$ 0	\$ 550	\$ 3,284	\$ 3,038	\$ 3,453	\$10,325
b. Total related funding requirements (estimated)						
1. Facility operating costs.....			\$ 15			
2. Programmatic operating expenses (Programs already exist that will be using these facilities. No increase in program costs will be incurred.).....				0		
Total related annual costs.....			\$ 15			

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

Programs already exist that will be using these facilities.

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 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- 
1. Title and location of project: Electrical system rehabilitation, phase I      2. Project No.: 88-R-807  
 Argonne National Laboratory (ANL)  
 Argonne, Illinois
- 
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 1987
4. Date construction ends: 4th Qtr. FY 1991

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<u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1988	\$5,060	\$ 350	\$ 350	\$ 350
	1989	0	2,150	2,150	1,650
	1990	0	2,000	2,000	2,490
	1991	0	560	560	570

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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

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

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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

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

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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

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

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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\*

	<u>Item Cost</u>
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.....	<u>\$5,060</u>

\*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  
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2. Project No.: 88-R-807

11. Method of Performance (continued)

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

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

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

	<u>Prior</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991</u>	<u>Total</u>
	<u>Years</u>					
a. Total project funding						
1. Total facility costs						
(a) Construction line item.....	\$ 0	\$ 350	\$1,650	\$2,490	\$ 570	\$5,060
(b) PE&D.....	0	0	0	0	0	0
(c) Expense funded equipment.....	0	0	0	0	0	0
(d) Inventories.....	0	0	0	0	0	0
Total facility costs.....	<u>\$ 0</u>	<u>\$ 350</u>	<u>\$1,650</u>	<u>\$2,490</u>	<u>\$ 570</u>	<u>\$5,060</u>
2. Other project funding						
(a) R&D necessary to complete construction.....	0	0	0	0	0	0
(b) Other project related costs.....	24	0	0	0	0	24
Total other project funding.....	<u>24</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>24</u>
Total project costs (Items 1 & 2)..	<u>\$ 24</u>	<u>\$ 350</u>	<u>\$1,650</u>	<u>\$2,490</u>	<u>570</u>	<u>\$5,084</u>
b. Other related funding requirements (estimated life of project: 30 years).....					\$ 0	
1. Facility operating costs.....					0	
2. Activity operating expenses directly related to the facility.....					0	



CONSTRUCTION PROJECT DATA SHEETS

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

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12. Funding Schedule of Project Funding and Other Related Funding Requirements (continued)

3. Capital equipment not related to construction but related to the programmatic effort in the facility.....	0	
4. GPP or other construction related to programmatic effort in the facility.....	0	
5. Other costs.....	0	
Total other related annual funding requirements.....	\$ 0	

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

a. Total project funding

1. Total facility costs

- (a) Construction line item - No narrative required
- (b) PE&D - None
- (c) Expense funded equipment - None
- (d) Inventories - None

2. Other project funding

- (a) No R&D effort is required
- (b) \$24,000 for a conceptual design

b. Other related funding requirements

The revised electrical distribution system will have a useful lifetime upwards of 30 years.

- 1. Facility operating costs - Implementation of this project will replace existing physical components in the electrical distribution system with new state-of-the-art equipment. This will result in a reduction of maintenance and operating costs while restoring an acceptable level of operational efficiency and reliability to the system, thus the system's operating cost is reported as zero.
- 2. Activity operating expenses directly related to the facility - Although this project will restore and replace general purpose facilities employed to supply electrical power to a wide variety of activities, there is no activity operating expense directly related to, or required for support of this project, thus the activity operating expense is reported as zero.
- 3. Capital equipment not related to construction but related to the activity effort in the facility - None
- 4. GPP or other construction related to activity effort - None
- 5. Other costs - None

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1. Title and location of project: Plant Modifications to Comply with EPA Requirements 2. Project No.: 88-R-809  
 Argonne National Laboratory (ANL)  
 Argonne, Illinois

3. Date A-E work initiated: 1st Qtr. FY 1988 5. Previous cost estimate: None  
 Date: N/A  
 3a. Date physical construction starts: 4th Qtr. FY 1988  
 6. Current cost estimate: \$ 1,820  
 Less amount for PE&D: 0  
 Net cost estimate: \$ 1,820  
 Date: December 1987  
 4. Date construction ends: 2nd Qtr. FY 1990

7. Financial Schedule:	Fiscal Year	Authorization	Appropriations	Obligations	Costs
	1988	\$ 1,820	\$ 820	\$ 820	\$ 600
	1989	0	1,000	1,000	880
	1990	0	0	0	340

8. Brief Physical Description of Project

This project will collect and neutralize coal pile run-off (rainwater) at a new treatment facility before discharging it to Sawmill Creek. An earthen dirt berm with an impervious clay liner installed near the coal pile will provide positive containment and collection of the run-off in an equalization pond. It will then be clarified and neutralized with caustic before being discharged into Sawmill Creek. The coal particles will be thickened and dewatered prior to ultimate disposal.

## CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Plant Modifications to Comply with EPA Requirements 2. Project No.: 88-R-809  
Argonne National Laboratory (ANL)  
Argonne, Illinois

8. Brief Physical Description of Project (continued)

Untreated boiler cooling and demineralizer rinse waters originating at the site will be diverted from storm water drainage systems feeding Sawmill Creek into the laboratory sewer system. Boiler bottom blowdown from Building 108 will be diverted from a retention pond that flows to Sawmill Creek into the new coal pile runoff treatment plant. Pressure filter blowdown from the domestic water treatment plant, sludge blowdown from the canal water treatment plant, and untreated cooling tower blowdown will be diverted from storm water drainage systems feeding Sawmill Creek into the sanitary sewer system.

Partial excavation, dewatering, disposal of water treatment plant solids from the existing lime sludge pond, and other associated work will be performed. The lime sludge will be utilized as a soil sweetener on farmland.

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

Coal, the principal fuel at the Boiler House, is stored outdoors in a large pile. Precipitation that falls on the coal pile reacts with the sulfur in the coal to form sulfuric acid and dissolves iron and other metals to a level exceeding EPA effluent limitations for discharge into Sawmill Creek and the Des Plaines River. At present, this run-off is collected and directed into a sludge pond on the site, which overflows into Sawmill Creek during times of heavy rain. Implementation will assure compliance with EPA regulations for direct discharge of the treated coal pile run-off into the creek.

Effluent discharge samples from the various National Pollution Discharge Elimination System (NPDES) permit locations have been in violation of EPA permit limits. In order to comply with the permit criteria it is necessary to divert these contaminated flow streams from the domestic water and canal water treatment plants and various building cooling towers to the sanitary sewer system. Collection of the boiler cooling and demineralizer blowdowns from Building 108 would permit treatment of the constituents in violation of standards. These wastes will be ultimately conveyed to the central waste water treatment plant located at facility 570 for treatment prior to discharge into Sawmill Creek.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Plant Modifications to Comply with EPA Requirements 2. Project No.: 88-R-809  
Argonne National Laboratory (ANL)  
Argonne, Illinois

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

The existing water treatment plant uses lime addition to "soften" the relatively hardwater caused by the ions of calcium and magnesium present in the water supply. These ions are precipitated as lime sludges in the water softening process. The lime sludges are conveyed to a sludge pond for disposal. An ion exchange water treatment system is currently under construction and will eliminate further generation of lime sludges and need for use of the pond.

Continuous effluent discharges from the sludge pond are polluting neighboring Sawmill Creek (used for swimming and fishing). These violations have been cited by the Illinois Environmental Protection Agency (IEPA) and are a health safety and public relations problem for ANL and the Department of Energy (DOE).

Underlying the sludge pond is a 100 ft. thick deposit of glacial till on top of the Niagaran Shallow Dolomite Bedrock Aquifer. This is widely used as a source of groundwater by ANL and adjacent municipalities. The existing pond is a blight on the landscape, killing vegetation and continuing to expand the adjacent area into a barren swamp.

Partial cleaning out the accumulated lime sludges in the sludge pond and some other associated work will mitigate further EPA permit violations of adjacent waters and will also slow down the rate of decay of the surrounding vegetation.

10. Details of Cost Estimate \*

	<u>Total Cost</u>
a. Engineering, design and inspection @ approximately 15% of construction, Item b.....	\$ 198
b. Construction costs.....	1,326
c. Contingency @ approximately 19% of above costs.....	296
Total estimated cost.....	<u>\$1,820</u>

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

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Plant Modifications to Comply with EPA Requirements 2. Project No.: 88-R-809  
Argonne National Laboratory (ANL)  
Argonne, Illinois

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11. Method of Performance

Engineering, design and inspection will be performed by Laboratory engineering personnel, aided by outside Architect/Engineering (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 Applicable.

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

Not Applicable.

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- |   |  |
|---|--|
| 1. Title and location of project: Hazardous waste handling facility<br>Lawrence Berkeley Laboratory (LBL)<br>Berkeley, California | 2. Project No.: 88-R-812   |
| 3. Date A-E work initiated: 2nd Qtr. FY 1988<br><br>3a. Date physical construction starts: 4th Qtr. FY 1989                       | 5. Previous cost estimate: None<br>Date:   |
| 4. Date construction ends: 1st Qtr. FY 1991   | 6. Current cost estimate: \$ 4,650<br>Less amount for PE&D: <u>0</u><br>Net cost estimate: \$ 4,650<br>Date: December 1987 |

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	\$ 350
	1989	0	3,950	3,950	1,610
	1990	0	200	200	2,065
	1991	0	0	0	625

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

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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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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.

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.



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MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- |  |   |
|--|---|
| 1. Title and location of project: Sanitary sewage treatment facility<br>Pacific Northwest Laboratory (PNL)<br>Richland, Washington | 2. Project No.: 88-R-814  |
| 3. Date A-E work initiated: 2nd Qtr. FY 1988   | 5. Previous cost estimate: None<br>Date: none \$  |
| 3a. Date physical construction starts: 3rd Qtr. FY 1989  | 6. Current cost estimate: \$ 3,000<br>Less amount for PE&D:        0<br>Net cost estimate:            \$ 3,000<br>Date: December 1987 |
| 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>
	1988	\$ 3,000	\$ 940	\$ 940	\$ 420
	1989	0	2,060	2,060	1,800
	1990	0	0	0	780

8. Brief Physical Description of Project

This project will provide a new sanitary sewage treatment facility of about 300,000 gallons/day capacity to replace the existing undersized and inadequate septic tank system. A pre-engineered metal building about 24 feet x 28 feet, utilities and a road will be provided for the sewage treatment facility operations and maintenance. Process water in laboratory buildings now going to the sanitary sewer will be properly routed to the process sewer to minimize loads on the sewage treatment facility.

Improvements to land includes clearing and grading about four acres of unoccupied land north of the 300 Area for the new sanitary storage treatment facility, a fence around the plant and a road to the plant.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Sanitary sewage treatment facility Pacific Northwest Laboratory (PNL) Richland, Washington	2. Project No.: 88-R-814
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8. Brief Physical Description of Project (continued)

Buildings include a pre-engineered building of about 700 square feet with operating, laboratory and maintenance space.

Utilities in the project include the elements making up the sewage treatment plant, such as ponds, diversion systems and other secondary treatment systems; installation of about 3300 feet of water line, electrical supply and telephone line to the sewage treatment plant.

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

The existing 300 Area sanitary sewage system is in marginal compliance with the state of Washington regulations and may not be in compliance with new proposed guidelines. Environmental data collected to assess the impact of the existing 300 Area sanitary sewage system on the underlying ground water and the adjacent stretch of the Columbia River revealed low fecal coliform bacteria levels upstream, adjacent to and downstream of the sewage leaching trenches. The data indicates fecal coliform concentrations below the State of Washington criteria for Class A water, provided that direct domestic usage of the ground water is restricted accordingly. While the presence of fecal coliform in the ground water is marginally acceptable at this time because well water is not used for human consumption, it could prove to be unacceptable in the near future with expected stricter interpretation of Washington State laws. The State's program goal is to maintain the highest possible standards to ensure the purity of all waters in the state. It also requires the use of all known available and reasonable methods to prevent and control the discharge of wastes into state waters. The existing septic tank installation was designed for approximately 95,000 gallons/day and it is overloaded in regard to sewage treatment by the 250,000-400,000 gallons/day (winter and summer, respectively) entering the system. The Washington State Health Department has indicated that construction of any additional septic tanks to increase the capacity would not be approved as the use of septic tanks is not an acceptable means of sewage treatment for the present use. About 140,000 gallons/day of summertime cooling water for air conditioning units will be rerouted to other sewer systems to minimize the design capacity of the new sewage treatment plant. The new sewage treatment plant will be designed for about 300,000 gallon/day, which will allow for a 20% growth.

It is estimated that the gross annual added cost for operating the new sewage plant is \$40,000 per year, which consists of \$30,000 for operations and maintenance and \$10,000 for utility costs.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Sanitary sewage treatment facility Pacific Northwest Laboratory (PNL) Richland, Washington	2. Project No.: 88-R-814
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10. Details of Cost Estimate

	<u>Item Costs</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ about 14% of construction, Item b.		\$ 300
b. Construction costs.....		2,200
(1) Improvements to land .....	\$ 450	
(2) Buildings - 501,700 sq. ft @ \$100/sq ft.....	70	
(3) Other structures .....	0	
(4) Special facilities .....	0	
(5) Utilities .....	1,680	
Subtotal.....		2,500
c. Contingency @ about 20% of above costs.....		500
Total estimated cost.....		\$ 3,000

11. Method of Performance

Definitive design and construction engineering/inspection will be performed by an offsite architect-engineer (A-E) under a negotiated contract. Construction of the sanitary sewage facility will be performed by fixed price contractors awarded on the basis of competitive bids. Project management will be by the operating contractor.

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.

DEPARTMENT OF ENERGY  
1989 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: Upgrade fire protection facilities at Y-12<br>Oak Ridge National Laboratory (ORNL)<br>Oak Ridge, Tennessee | 2. Project No.: 88-R-817  |
| 3. Date A-E work initiated: 1st Qtr. FY 1988<br>3a. Date physical construction starts: 4th Qtr. FY 1988                                      | 5. Previous cost estimate: None<br>Date: none   |
| 4. Date construction ends: 4th Qtr. FY 1990  | 6. Current cost estimate: \$ 1,750<br>Less amount for PE&D:       0<br>Net cost estimate:       \$ 1,750<br>Date: December 1987 |

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1988	\$1,750	\$ 770	\$ 770	\$ 280
	1989	0	980	980	855
	1990	0	0	0	615

8. Brief Physical Description of Project

Upgrade fire protection facilities at Y-12 is the ORNL segment of a program to provide new or updated fire protection systems throughout the Y-12 Plant site. This project, along with a related similar project submitted by Y-12, will correct deficiencies that have been identified in fire protection audits of the Y-12 Plant conducted by DOE, the Operating Contractor (OC) Fire Protection Engineering Staff, and an independent contractor.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Upgrade fire protection facilities at Y-12 Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee
2. Project No.: 88-R-817
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8. Brief Physical Description of Project (continued)

The work will include the installation of sprinkler systems, early warning devices, and improved systems to facilitate efficient firefighting efforts in the ORNL Research Facilities housed within buildings at the Y-12 Plant. The work will be performed in buildings housing the Biology, Operations, Engineering Technology, and Fusion Energy Divisions of ORNL. Wet or dry sprinkler systems, or Halon systems, will be provided for office areas, storage areas, and laboratories in certain buildings as required. Early warning systems such as heat and/or smoke detection devices and temperature or pressure alarms will be provided for certain areas. Centralized master box and by-pass switch locations, as well as improved firewater distribution systems and fire dampers, will be provided to improve the efficiency of firefighting efforts in certain buildings. Improved facilities for the safe handling of flammable/hazardous materials, including one new flammable liquid storage building, will be provided in certain areas.

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

The purpose of this project is to correct deficiencies that have been identified by the OC Fire Protection Audits and DOE Audits conducted by an independent contractor. Correction of these deficiencies will help bring the ORNL Facilities at Y-12 into compliance with DOE Order 5480.1, Chapter 7, "Fire Protection." This, in turn, will aid ORNL in maintaining the "improved risk" concept of fire protection which includes life, safety, and property conservation.

As a result of these fire protection deficiencies, research programs such as Impurities Study Experiment, Thermal Hydraulic Out of Reactor Safety, Elmo Bumpy Torus, Core Flow Test Loop, Isotope Enrichment Production, and Prestressed Concrete Reactor Vessel are subject to incurring financial and operational losses in the event of a fire. Several office areas, laboratories, and workshops in the Engineering Technology, Fusion Energy, Operations, and Biology Divisions must have sprinkler protection installed to minimize potential personal injury and property loss in the event of a fire. Low firewater pressure on the upper floors of the Biology Facility reduces firefighting effectiveness in this building which houses many of the Biology Division's animal research facilities.



DEPARTMENT OF ENERGY  
 FY 1989 CONGRESSIONAL BUDGET REQUEST  
 CONSTRUCTION PROJECT DATA SHEETS  
 Energy Supply Research and Development  
 Multiprogram Energy Laboratories--Facilities Support  
 Multiprogram Energy Laboratories - General Purpose Facilities

(Tabular dollars in thousands. Narrative material in whole dollars.)

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|---|--|
| 1. Title and location of project: Piping system restoration<br>Oak Ridge National Laboratory,<br>Oak Ridge, Tennessee | 2. Project No.: 87-R-752                                 |
| 3. Date A-E work initiated: 1st Qtr. FY 1987  | 5. Previous cost estimate: None<br>Date: None            |
| 3a. Date physical construction starts: 1st Qtr. FY 1988   | 6. Current cost estimate: \$3,800<br>Date: December 1987 |
| 4. Date construction ends: 2nd Qtr. FY 1989   |  |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1987	\$ 3,800	\$ 725	\$ 725	\$ 295
	1988	0	2,475	2,475	1,855
	1989	0	600	600	1,650

8. Brief Physical Description of Project

This project contains three parts:

- o The replacement, refurbishment, or upgrading of unreliable or overloaded utility piping distribution systems currently serving Oak Ridge National Laboratory (ORNL) facilities located in the Y-12 Plant. The outdated piping distribution systems included in the project are no longer efficiently repaired. They include steam, cooling-tower water, and demineralized water. In addition to pipe replacement, valves, filters, pumps, and motors will also be replaced.
- o The addition of a demineralizer and feed water charcoal filter to the central demineralized water system in order to provide a continuous supply of demineralized water adequate to meet ORNL at Y-12 requirements.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Piping system restoration  
Oak Ridge National Laboratory,  
Oak Ridge, Tennessee

2. Project No.: 87-R-752

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8. Brief Physical Description of Project (continued)

- o The installation of a new air compressor and dryer with a capacity of 3,000 cubic feet per minute (cfm) in the central instrument air system to provide air to critical operations. This unit is needed to meet existing requirements of ORNL at Y-12.

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

The purpose of this project is to restore two critical utilities supporting ORNL at Y-12 to an appropriate level of reliability and capacity, thus minimizing the adverse consequences of potential system failures or curtailments on research activities.

ORNL at Y-12 facilities are supplied utility services from central systems operated by the Y-12 Utilities Department. These systems consist of many pieces of equipment and distribution networks that predate ORNL's presence in Y-12. As such, the systems were installed and maintained primarily in support of weapon component production. ORNL facilities have been provided these utility services because the ORNL divisions occupy buildings that formerly housed weapons-related activities. Relatively few ORNL capital or programmatic funds have been spent to expand or renovate the distribution networks, to enlarge system capacity, or to replace worn or obsolete equipment.

Since 1980, the Y-12 Plant has been systematically replacing several worn or unreliable pieces of equipment, including compressors that supply the central systems. However, this replacement has occurred almost exclusively in the portion of Y-12 dedicated to weapons components production. Old compressors in the ORNL portion of the plant are not currently scheduled for replacement.

Two systems of specific interest, instrument air and demineralized water, are structured so that the two areas which they serve can be separated. In emergency situations, demineralized water can be totally shut off to ORNL facilities, and the instrument air distribution network valves so ORNL facilities will be solely dependent on an inadequate, 30-year-old compressor.



CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Piping system restoration  
Oak Ridge National Laboratory,  
Oak Ridge, Tennessee

2. Project No.: 87-R-752

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

The demineralized water system currently is being upgraded by the Y-12 Plant to a 200-gallon-per-minute (gpm) production rate. However, backup capacity during demineralizer regeneration is only 100 gpm. The 200 gpm will supply both Y-12 and ORNL facility requirements, but 100 gpm will not. During regeneration of the primary demineralizer, it is to be expected that demineralized water to ORNL facilities will, on occasions, be curtailed. Depending on the type of feed water used (condensate, softened water, or process water), regeneration can occur as often as once a day using process water or once every 4 to 6 days using softened water. The Biology, Fusion Energy, and Engineering Technology divisions, and the Isotope Enrichment Group of the Operations Division use demineralized water in various experimental and operational activities. A prolonged shutdown of demineralized water would have a significant negative impact on all four divisions.

The proposed demineralizer (100-gpm capacity) will be installed in the central demineralized water plant to ensure a continuous 200-gpm production rate. It is vital to ORNL research objectives that the proposed demineralizer and filter be installed to ensure a reliable supply of demineralized water.

The instrument air compressors being replaced by Y-12 are in the production portion of the plant. The new units are sized only to meet production requirements and do not include capacity for ORNL facilities. Despite this replacement program, the newly defined instrument air requirements and the continued existence of several old and unreliable compressors makes doubtful a secure supply of instrument air unless ORNL invests in the system capacity.

The reciprocating compressor to be replaced has a nominal 1,500 cfm capacity. As is typical of a reciprocating-type compressor of its age, this compressor needs an extensive annual overhaul to prolong its life. Immediately after the overhaul, the compressor produces 1,500 cfm; but in a period of about 2 months, this capacity deteriorates to approximately 1,000 cfm.

1. Title and location of project: Piping system restoration  
Oak Ridge National Laboratory,  
Oak Ridge, Tennessee

2. Project No.: 87-R-752

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

ORNL facilities require approximately 3,000 cfm, and the new compressor is sized to meet this requirements. Only by investing in a new compressor of this size can ORNL ensure a reliable and adequate supply of instrument air. The integration of this instrument air into research and production activities by using in pneumatic control systems, equipment operation, cooling, test and inspection, and various support activities makes the installation of this new compressor vital to the accomplishment of ORNL objectives.

Based on engineering assessments, the continued operation of laboratory facilities is vulnerable to other unreliable utility piping distribution systems that have not been systematically upgraded since their installation in the 1940's. Though recognized as an urgent need, the work has not been possible, except on a piecemeal basis, under prevailing budget limitations. Renovations and upgrading of the utility piping distribution systems will enhance the inherent capability of these facilities over the long term. Systems that can be categorized as unreliable include the tower-water distribution and recirculating-demineralized water distribution systems serving the Isotope Separations building. These systems date back to the mid-1940's. Since that time, upgrading has occurred through routine or emergency maintenance. Valve gates have rusted and no longer seal. Filters have deteriorated such that internal element supports are not functional.

A major steam-control station providing process and heating steam to the Fusion Energy Administration and Laboratory facility does not provide adequate control and experiences frequent outages requiring much maintenance. Recirculating-demineralized water pumps serving the Fusion Energy and Engineering Technology building are about 30 years old and require expensive, time-consuming repairs because replacement parts are no longer available and must be shop fabricated.

The utility systems serving ORNL at Y-12 cannot be considered as separate systems from the Y-12 utility system. The systems were installed in the 1940's as continuous systems designed to serve the site as a whole. In the portion of Y-12 not occupied by ORNL, the system's condition reached the critical point in FY 1979, and refurbishment was approved starting in FY 1980. The same risks apply to these ORNL facilities within Y-12, which were constructed during the same time period.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Piping system restoration  
Oak Ridge National Laboratory,  
Oak Ridge, Tennessee

2. Project No.: 87-R-752

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

Considering the importance of the research programs and the magnitude of the total investment, it is important that the reliability of piped utility services for these facilities be restored to original status and, in many cases, modified to accommodate current levels of use.

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.....		\$ 401
b. Construction costs.....		2,756
(1) 4000 building modifications.....	\$ 684	
(2) Special facilities.....	2,072	
Subtotal.....		<u>3,157</u>
c. Contingency at approximately 20% of above costs.....		643
Total estimated costs.....		<u>\$ 3,800</u>

11. Method of Performance

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 awarded on the basis of competitive bids.

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\*The above estimate is based on a completed conceptual design.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Piping system restoration  
Oak Ridge National Laboratory,  
Oak Ridge, Tennessee

2. Project No.: 87-R-752

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

Not required; total estimated cost is less than \$5,000,000.

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

Not required.

DEPARTMENT OF ENERGY  
 1989 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<br>Argonne National Laboratory (ANL)<br>Argonne, Illinois | 2. Project No.: 87-R-753  |
| 3. Date A-E work initiated: 1st Qtr. FY 1987  | 5. Previous cost estimate: None<br>Date: None   |
| 3a. Date physical construction starts: 1st Qtr. FY 1988   | 6. Current cost estimate: \$ 12,035<br>Less amount for PE&D: 0<br>Net cost estimate: \$ 12,035<br>Date: December 1987 |
| 4. Date construction ends: 3rd Qtr. FY 1991   |   |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1987	\$ 12,035	\$ 1,235	\$ 1,235	\$ 521
	1988	0	3,600	3,600	2,000
	1989	0	3,600	3,600	4,100
	1990	0	3,600	3,600	3,065
	1991	0	0	0	2,349

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.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Rehabilitate laboratory space  
Argonne National Laboratory (ANL)  
Argonne, Illinois

2. Project No.: 87-R-753

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8. Brief Physical Description of Project (continued)

The workscope will encompass essentially all aspects of building construction, except structure and roofing<sup>1</sup>, 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, piping<sup>2</sup>); 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.

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<sup>1</sup> Included under on-going Project No. 85-R-702 "Replace Laboratory Roofs".

<sup>2</sup> 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\*:

Total Cost

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.

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

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

	<u>Prior Years</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991</u>	<u>Total</u>
a. Total project costs							
1. Total facility costs							
(a) Construction line item.....	\$ 0	\$ 521	\$ 2,000	\$ 4,100	\$ 3,065	\$ 2,349	\$12,035
(b) PE&D.....	0	0	0	0	0	0	0
(c) Expense funded equipment.....	0	0	0	0	0	0	0
(d) Inventories.....	0	0	0	0	0	0	0
Total direct costs.....	\$ 0	\$ 521	\$ 2,000	\$ 4,100	\$ 3,065	\$ 2,349	\$12,035
2. Other project costs							
(a) R&D necessary to complete construction.....	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
(b) Other project related costs.....	51	0	0	0	0	0	51
Total other project costs.....	\$ 51	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 51
Total project costs..... (Item 1 and 2)	\$ 51	\$ 521	\$ 2,000	\$ 4,100	\$ 3,065	\$ 2,349	\$12,086
b. Other related annual costs (estimated life of project: 20 years)							
1. Facility operating costs .....							\$ 0
2. Activity operating expenses directly related to the facility .....							0
3. Capital equipment not related to construction but related to the programmatic effort in the facility .....							0
4. GPP or other construction related to programmatic effort in the facility.....							0
5. Other costs .....							0
Total related annual costs.....							0



CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Rehabilitate laboratory space  
Argonne National Laboratory (ANL)  
Argonne, Illinois

2. Project No.: 87-R-753

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

a. Total project funding

1. Total facility

(a) Construction line item - No narrative required

(b) PE&D - None

(c) Expense funded equipment - None

(d) Inventories - None

2. Other project funding

(a) No R&D effort is required

(b) \$51,000 spent for conceptual design

b. Other related funding requirements

1. Facility operating costs - Rehabilitation of this facility will increase energy efficiency and greatly lower operating costs, thus the facility operating cost is given as zero.

2. Activity operating expenses directly related to the facility - There is no activity operating expense directly related to, or required for support of this project, thus the activity operating expense is given as zero.

3. There is no capital equipment related to the activity effort, not related to construction.

4. GPP or other construction related to activity effort - None

5. Other costs - None

DEPARTMENT OF ENERGY  
 1989 CONGRESSIONAL BUDGET REQUEST  
 CONSTRUCTION PROJECT DATA SHEETS  
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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|---|---|
| 1. Title and location of project: Mechanical systems rehabilitation<br>Argonne National Laboratory (ANL)<br>Argonne, Illinois | 2. Project No.: 87-R-755  |
| 3. Date A-E work initiated: 1st Qtr. FY 1987  | 5. Previous cost estimate: None<br>Date: None   |
| 3a. Date physical construction starts: 4th Qtr. FY 1987   | 6. Current cost estimate: \$ 3,200<br>Less amount for PE&D:           0<br>Net cost estimate:           \$ 3,200<br>Date: December 1987 |
| 4. Date construction ends: 1st Qtr. FY 1989   |   |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1987	\$ 3,200	\$ 600	\$ 600	\$ 99
	1988	0	2,100	2,100	1,590
	1989	0	500	500	1,511

8. Brief Physical Description of Project

This project will restore worn parts of the central heating ventilation and air conditioning (HVAC) systems in three large office and laboratory buildings, Building 203, Building 205, and Building 212. Forty-three large field fabricated walk-in type air handling units require extensive rebuilding. These units range in size from 8,000 to 30,000 cfm (each roughly 25 to 75 tons of refrigeration capacity). Each provides ventilation air and climate control to a large bank of experimental laboratories and their adjacent offices. Required work is as follows:

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Mechanical systems rehabilitation  
Argonne National Laboratory (ANL)  
Argonne, Illinois

2. Project No.: 87-R-755

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8. Brief Physical Description of Project (continued)

Chilled Water Coils: The air handling units selected for overhaul are those with steel coil frames rusted through. The frames no longer support the coils, nor do they prevent untreated air from bypassing the coils. Replacement entails providing adjacent coil blank-off panels, new local piping, and vapor-proof exterior insulation over the new parts.

Preheat Coils: This project will replace all preheat coils in the selected air-handling units with glycol-filled coils. The existing steam coils require replacing because of corroded frames. The poor performance of the aged steam coils and the resulting downstream damage to the systems makes renovation with new technology urgent. Replacement must include new coil supports, steam-to-glycol heat exchangers at selected locations, appropriate changes in the control hardware, new local piping and associated pipe insulation.

Filters: Replacement of selected filter banks within the air handling units is included in the project scope. Those selected for replacement are located downstream of the coils they are intended to protect. Their location and rusted condition have made them maintenance liabilities, and their low-tech filtering efficiency is no longer adequate for the scientific programs which rely on them. Replacement must include current-technology automatic 85% efficiency filters, appropriate sheet metal modifications to accommodate the change, some modifications of electrical conduit and wiring, and associated monitoring instruments.

Sheet Metal: Sheet metal parts downstream of the cooling coils will be replaced. They are corroded from moisture carry-over. Coil drain pans, metal floors and the lower parts of the housings require repair or replacement to maintain airtightness. Upstream portions of the housings are generally in good condition and represent a considerable asset compared with the cost of all-new air handling assemblies.

Controls: Existing 3-way chilled water control valves are worn obsolete types. They will be replaced with energy-efficient 2-way valves. Associated control components of obsolete manufacture and poor parts availability have been marked for replacement.

Painting: All exposed new work will be painted.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Mechanical systems rehabilitation  
Argonne National Laboratory (ANL)  
Argonne, Illinois

2. Project No.: 87-R-755

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8. Brief Physical Description of Project (continued)

Packaged Units: In addition, six packaged air conditioning units deemed to be rusted beyond reasonable repair will be replaced in total. Eight other salvageable packaged units will be equipped with glycol preheat coils and rusted filter sections will be replaced.

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

The three buildings in question are large permanent brick laboratory-office buildings, each housing from 200 to 340 people and serving important scientific research programs such as the tandem-linac, battery development, laser projects, basic energy sciences and nuclear energy studies. The mechanical components providing the essential ambiance control for the scientists are from 25 to over 30 years old and have served their normal useful lives (20 to 25 years is average, according to DOE Life Cycle Costing guidelines). Cooling, humidity control, and clean air delivery are no longer reliable. Large scale unprecedented low chilled water flows in these buildings have been traced to unreliable preheat performance, in turn causing downstream coil freezing, frequent system drainage, extraordinary pipe corrosion, and widespread clogging of small water passages. Correction is urgent.

The air systems included in this project comprise approximately one-half of the total units for the three buildings. Units that can be temporarily restored by strategic coil replacement and those units showing little deterioration have not been included in this list and will be assigned for future attention when required.

The extent of so much simultaneous use and aging carries the scope of renewal beyond available operating funds; capital funding is required. Because of the close inter-relation of components it is more cost effective to completely rebuild each central unit instead of replacing parts piecemeal. The one obvious alternative of abandoning these failing systems amounts to an unreasonable condemnation of large investments in otherwise very high quality permanent research facilities. A second alternative of buying all new air handling facilities is undesirable from a research-interruption viewpoint and is considered unnecessarily expensive. The third known alternative, of piecemeal parts replacement is the one now in use. Proper use of operating funds under acceptable accounting procedures limits both the character and the extent of permissible renovation. The result of this alternative is marginal reliability and poor return for effort and expense.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Mechanical systems rehabilitation  
Argonne National Laboratory (ANL)  
Argonne, Illinois

2. Project No.: 87-R-755

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

Thoughtful preplanning of rebuilding offers opportunities to use current technology to improve reliability (glycol preheat) and save energy (2-way control valves and improved control cycles). Overall, the project will release operating people from intensive breakdown maintenance and allow a return to more reasonable maintenance planning for the units involved.

10. Details of Cost Estimate\*:

Total Cost

a. Engineering, design, and inspection at 15% of construction costs, item b.....	\$ 353
b. Construction costs.....	2,373
c. Demolition and removal and debris.....	59
Subtotal.....	<u>\$ 2,785</u>
d. Contingency at 15% of above costs.....	415
Total estimated costs.....	<u>\$ 3,200</u>

11. Method of Performance

Design and inspection will be performed by ANL personnel assisted by outside engineering services. Construction and procurement will be accomplished by fixed-price contracts awarded on the basis of competitive bidding.

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

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

Not required, TEC is less than \$5,000,000.

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

Not required.

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

1. Title and location of project: 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 1987
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	1,500	1,500	1,400
	1989	0	3,134	3,134	2,000
	1990	0	0	0	1,662

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.

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

2. Project No.: 87-R-756

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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\*:

Item Cost      Total Cost

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.

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

	<u>Prior Years</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>Total</u>
a. Total project cost						
1. Total costs						
(a) Construction line item.....	\$ 0	\$ 138	\$ 1,400	\$ 2,000	\$ 1,662	\$ 5,200
(b) PE&D.....	0	0	0	0	0	0
(c) Expense funded equipment.....	0	0	0	0	0	0
(d) Inventories.....	0	0	0	0	0	0
Total direct costs.....	<u>\$ 0</u>	<u>\$ 138</u>	<u>\$ 1,400</u>	<u>\$ 2,000</u>	<u>\$ 1,662</u>	<u>\$ 5,200</u>
2. Other project costs						
(a) R&D necessary to complete construction.....	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
(b) Other project related costs.....	8	0	0	0	0	8
Total other project costs.....	<u>\$ 8</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 8</u>
Total project costs (Item 1 and 2)...	<u>\$ 8</u>	<u>\$ 138</u>	<u>\$ 1,400</u>	<u>\$ 2,000</u>	<u>\$ 1,662</u>	<u>\$ 5,208</u>
b. Other related funding requirements						
1. Facility operating costs.....						0
2. Activity operating expenses directly related to the facility.....						0
3. Capital equipment not related to construction but related to the programmatic effort in the facility.....						0
4. GPP or other construction related to programmatic effort in the facility.....						0
5. Other costs.....						0
Total related annual costs.....						<u>0</u>

CONSTRUCTION PROJECT DATA SHEETS

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

2. Project No.: 87-R-756

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

- a. Total project funding
  - 1. Total facility costs
    - (a) Construction line item - No narrative required
    - (b) PE&D - None
    - (c) Expense funded equipment - None
    - (d) Inventories - None
  - 2. Other project funding
    - (a) No R & D effort is required
    - (b) \$8,000 for conceptual design

b. Total related funding requirements

The water lines will have a useful lifetime longer than 30 years.

- 1. Facility operating costs - Implementation of this project will replace existing water lines. This will result in a reduction of maintenance to repair pipe breaks, and restore an acceptable level of operational efficiency to existing facilities. Thus the facility operating cost is reported as zero.
- 2. Programmatic operating expenses directly related to the facility - Although this project will restore and replace general purpose facilities employed to perform a wide variety of activities, there is no activity operating expense directly related to, or required for support of this project, thus the activity operating expense is reported as zero.
- 3. Capital equipment not related to construction but related to the activity effort in the facility - None
- 4. GPP or other construction related to activity effort - None
- 5. Other costs - None

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 MULTIPROGRAM ENERGY LABORATORIES--FACILITIES SUPPORT  
 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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|--|--|
| 1. Title and location of project: Electrical system rehabilitation<br>Lawrence Berkeley Laboratory<br>Berkeley, California | 2. Project No.: 87-R-757   |
| 3. Date A-E work initiated: 2nd Qtr. FY 1987   | 5. Previous cost estimate: None<br>Date: None  |
| 3a. Date physical construction starts: 3rd Qtr. FY 1988  | 6. Current cost estimate: \$ 2,600<br>Less amount for PE&D:        0<br>Net cost estimate:         \$ 2,600<br>Date: December 1987 |
| 4. Date construction ends: 4th Qtr. FY 1989  |  |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1987	\$ 2,600	\$ 300	\$ 300	\$ 3
	1988	0	1,840	1,840	1,780
	1989	0	460	460	817

8. Brief Physical Description of Project

This project is the first of several elements to improve the reliability of the electrical distribution system for the entire Laboratory.

This project will rehabilitate the 12kV main substation of Lawrence Berkeley Laboratory's (LBL) power distribution system. LBL's main substation is located on the upper hill area and distributes 28 Megawatts peak power to area substations through a 12.46 kV primary distribution system. The main substation is served by Pacific Gas and Electric (PG&E) through two 115kV/12.46kV transformers with 20 MVA and 30 MVA capacity. The main substation switchgear is arranged in split bus configuration, each bus connecting directly to PG&E switches. Each bus consists of three feeder breakers. A metal enclosed tie switch provides for connection of the two bus systems. The rehabilitation of the main substation will include the replacement of the existing substandard circuit breakers and addition of incoming, tie and feeder circuit breakers. The project provides also for addition of an air switch assembly consisting of feeder and tie switches. The project will utilize the existing substation site with the following structural modifications:

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Electrical system rehabilitation  
Lawrence Berkeley Laboratory  
Berkeley, California

2. Project No.: 87-R-757

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8. Brief Physical Description of Project (continued)

- o Increase of substation floor space by 600 square feet.
- o Extension of existing underground cable vault by 11 feet.
- o Construction of retaining walls, up-ramp and stairs for elevated floor section.

The following major items comprise the scope of this project:

1. Replace six existing air circuit breakers with power vacuum circuit breakers.
2. Add three incoming line breakers to the 12kV buses.
3. Replace one existing tie switch between Bus 1 and 2 with a full capacity circuit breaker.
4. Add four feeder breakers to Bus 1 and 3 feeder breakers to Bus 2.
5. Add air switch assembly consisting of 6 feeders and one tie load interrupter switch.
6. Install data acquisition system and communications unit for remote control indication and metering.
7. Perform a power system study determining short circuit levels and protective device coordination.

These new government-owned facilities or improvements will be located on leased land owned by the Regents of the University of California.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Electrical system rehabilitation  
Lawrence Berkeley Laboratory  
Berkeley, California

2. Project No.: 87-R-757

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

This project will correct existing deficiencies at the 12kV main substation, which feeds the area substations of the entire Laboratory. The project will upgrade the substation to current National Electrical Code (NEC) safety requirements and provide for improvement in reliability and maintainability. The project will permit LBL to take advantage of favorable electric rate schedules by providing access to reduced cost interruptible power or higher cost firm power to all Laboratory facilities. The project will fully provide for present and long range power distribution requirements at LBL's main substation.

The existing 12kV main substation does not meet the Laboratory's operating requirements for the following reasons:

1. The existing substation equipment is aged, substandard, and hazardous;
2. The existing bus configuration does not permit LBL to isolate utility incoming lines and bus sections without cooperation from the utility and prior operation of their switchgear.
3. The tie switch in the switchgear assembly is underrated and unsafe to operate without cooperation from the utility company and prior operation of their switches.
4. The existing switchgear has insufficient circuit breakers requiring doubling of outgoing feeders and direct connection of outgoing feeders to the main bus.
5. The minimum space requirements stipulated by the National Electric Code for safe operation and maintenance are not complied with.

The above deficiencies have resulted in the following operational difficulties:

- o Incoming line power failure on one supply line requires public utility switching prior to LBL's closing tie switch and restoring service. This results in extensive response time and long power outages.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Electrical system rehabilitation  
Lawrence Berkeley Laboratory  
Berkeley, California

2. Project No.: 87-R-757

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

- o Maintenance on switchgear is only performed when power outage occurs. The switchgear construction is such that safe maintenance can only be performed with line and load side de-energized. The line sides can only be de-energized by public utility switching, which occurs at infrequent intervals.
- o Utilization of cost economic power source is not always possible. The existing number of feeder breakers is insufficient to provide dual sources to all users for most economic power rate selection.
- o Decreased reliability in dual connected supply feeders due to circuit breaker tripping caused by failure in one feeder line and affecting service in the other line.

10. Details of Cost Estimate\*:

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design, and inspection at about 15% of construction costs, item b.....		\$ 280
b. Construction costs.....		1,850
(1) Improvements to land.....	\$ 130	
(2) Utilities.....	240	
(3) Special facilities engineered equipment.....	\$ 1,480	
Subtotal.....		<u>\$ 2,130</u>
c. Contingency at about 22% above costs.....		470
Total estimated costs.....		<u>\$ 2,600</u>

\*Based upon a completed conceptual design.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Electrical system rehabilitation  
Lawrence Berkeley Laboratory  
Berkeley, California

2. Project No.: 87-R-757

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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. At the time of scoping construction and procurement, specific parts of the project will be set aside for SBA 8A subcontracts. Candidate items are conduit placement, structural slab, cable splicing, fencing and landscaping.

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.

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 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- |   |  |
|---|--|
| 1. Title and location of project: Rehabilitate Mechanical Utilities<br>Lawrence Berkeley Laboratory (LBL)<br>Berkeley, California | 2. Project No.: 87-R-758   |
| 3. Date A-E work initiated: 2nd Qtr. FY 1987  | 5. Previous cost estimate: None<br>Date: None  |
| 3a. Date physical construction starts: 3rd Qtr. FY 1988   | 6. Current cost estimate: \$ 5,500<br>Less amount for PE&D: <u>0</u><br>Net cost estimate: \$ 5,500<br>Date: December 1987 |
| 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	\$ 5,500	\$ 915	\$ 915	\$ 83
	1988	0	3,000	3,000	1,100
	1989	0	1,585	1,585	2,580
	1990	0	0	0	1,737

8. Brief Physical Description of Project

The work proposed under this project is the upgrading and/or replacement of components of existing utility systems throughout the Lawrence Berkeley Laboratory site; this project will not completely rehabilitate the systems, but it will correct the more urgent and serious deficiencies.

Some examples of the mechanical utilities deficiencies to be addressed are:

1. The 4-inch domestic water main to Building 74 is badly damaged, and failure will jeopardize programs that utilize the animal colony. Piping cross connections have been made with the industrial water supply in violation of the Plumbing Code, and the 8-inch domestic water main from Shasta Reservoir is overstressed due to soil settlement - failure will greatly reduce flow to many Laboratory buildings.



CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Rehabilitate Mechanical Utilities  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2. Project No.: 87-R-758

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8. Brief Physical Description of Project (continued)

2. The cooling tower at Building 88 is overloaded on hot days, and requires increased cooling capacity.
3. The central compressed air plant is not sufficiently reliable, and interruptions affect various programs lab wide that rely upon the central air supply.
4. Natural gas mains have exceeded expected life and leaks would result in fire and loss of life, hazards and interruptions to programs.

Proposed facilities will be designed to the latest codes and will use the most suitable types of materials and equipment. The design will provide for more reliable service, safer and more efficient operation, better access and backup capacity for critical features such as fire protection. New work will avoid, wherever possible unstable areas on the site and will incorporate the best design and construction practices to mitigate unfavorable site conditions when these areas cannot be bypassed. Timely construction of the proposed work will prevent future breakdowns that could be hazardous, that could disrupt vital LBL functions, and that could result in costly repairs to the old systems.

The improvements described herein will be made to existing government-owned facilities located on leased land owned by the Regents of the University of California.

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

Lawrence Berkeley Laboratory (LBL) was established over 40 years ago.

Portions of the utilities have outlived their useful life, as evidenced by the repairs and piecemeal replacement that have been necessary to keep the systems in operation. Other portions of the systems, have become obsolete because of changing requirements. Still other sections of utilities have been constructed in areas of the site in which unstable or otherwise unfavorable soil conditions exist; the earlier systems constructed in these areas did not utilize materials and construction methods that are now available to offset the adverse natural

CONSTRUCTION PROJECT DATA SHEETS

- 
1. Title and location of project: Rehabilitate Mechanical Utilities  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California
2. Project No.: 87-R-758
- 

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

conditions. Furthermore, safety standards, quality of materials, and construction techniques have changed over the years so that some of the facilities constructed in the 1940s, the 1950s, and even the 1960s are now substandard. In short, the age, the changing requirements for services, natural site conditions, and higher standards for safety and construction all have contributed to the deficiencies in the existing utility systems.

The rehabilitation of LBL site mechanical utilities has been planned to be phased in two separate projects scheduled for funding in FY 1987, Phase I, and in FY 1990, Phase II. The plan for phasing results from the need to mitigate program disruptions through careful sequencing of construction, to enhance the cost effectiveness of the work by improving the flexibility for change in the first phase, and, finally, to prioritize LBL's funding in relation to other urgent needs.

<u>10. Details of Cost Estimate<sup>a/</sup>:</u>	<u>Total Cost</u>
a. Engineering, design, and inspection at about 15% of construction costs.....	\$ 600
b. Construction costs.....	3,900
Subtotal.....	\$ 4,500
c. Contingency at about 22% above costs.....	1,000
Total estimated costs.....	\$ 5,500

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<sup>a/</sup> Based on completed conceptual design.

11. Method of Performance

Engineering design will be performed under a negotiated architect engineer subcontract. Inspection, some engineering and some construction will be accomplished by LBL engineering staff. Construction and procurement will be accomplished by fixed price subcontracts awarded on the basis of competitive bids. At the time of scoping construction and procurement, specific parts of the project will be set aside for Small Business Administration 8A subcontracts. Candidate items are painting and labeling air and propane equipment and piping associated with upgrading the compressor plant and the propane plant.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Rehabilitate Mechanical Utilities  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2. Project No.: 87-R-758

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

	<u>Prior Years</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>Total</u>
a. Total project costs						
1. Total facility costs						
(a) Construction line item.....	\$ 0	\$ 83	\$ 1,100	\$ 2,580	\$ 1,737	\$ 5,500
(b) CP&D.....	0	0	0	0	0	0
(c) Expense funded equipment.....	0	0	0	0	0	0
(d) Inventories.....	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total direct costs.....	\$ 0	\$ 83	\$ 1,100	\$ 2,580	\$ 1,737	\$ 5,500
2. Other project costs						
(a) R&D necessary to complete construction.....	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
(b) Other project related costs..	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total other project costs....	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Total project costs (Items 1 & 2).....	<u>\$ 0</u>	<u>\$ 83</u>	<u>\$ 1,100</u>	<u>\$ 2,580</u>	<u>\$ 1,737</u>	<u>\$ 5,500</u>
b. Total related annual costs (50 years)						
1. Facility operating costs.....						\$ 0
2. Programmatic operating expenses directly related to the facility .....						0
3. Capital equipment not related to construction but related to the programmatic effort in the facility .....						0
4. GPP or other construction related to programmatic effort in the facility.....						0
5. Other costs.....						<u>\$ 0</u>
Total other related annual funding costs.....						<u>\$ 0</u>

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Rehabilitate Mechanical Utilities  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2. Project No.: 87-R-758

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

	<u>Prior Years</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>Total</u>
a. Total project costs						
1. Total facility costs						
(a) Construction line item.....	\$ 0	\$ 83	\$ 1,100	\$ 2,580	\$ 1,737	\$ 5,500
(b) CP&D.....	0	0	0	0	0	0
(c) Expense funded equipment.....	0	0	0	0	0	0
(d) Inventories.....	0	0	0	0	0	0
Total direct costs.....	\$ 0	\$ 83	\$ 1,100	\$ 2,580	\$ 1,737	\$ 5,500
2. Other project costs						
(a) R&D necessary to complete construction.....	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
(b) Other project related costs..	0	0	0	0	0	0
Total other project costs....	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Total project costs (Items 1 & 2).....	\$ 0	\$ 83	\$ 1,100	\$ 2,580	\$ 1,737	\$ 5,500
b. Total related annual costs (50 years)						
1. Facility operating costs.....						\$ 0
2. Programmatic operating expenses directly related to the facility .....						0
3. Capital equipment not related to construction but related to the programmatic effort in the facility .....						0
4. GPP or other construction related to programmatic effort in the facility.....						0
5. Other costs.....						\$ 0
Total other related annual funding costs.....						\$ 0

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Rehabilitate Mechanical Utilities  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2. Project No.: 87-R-758

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

a. Total project funding

1. Total facility costs

- (a) Construction line item - No narrative required
- (b) CP&D - No narrative required
- (c) Expense funded equipment - No narrative required
- (d) Inventories - No narrative required

b. Total related funding requirements (Facility Program use est. 50 years).

- 1. Facility operating costs - No narrative required
- 2. Programmatic operating expenses - No narrative required
- 3. Capital equipment no related to construction - No narrative required
- 4. GPP or other construction - No narrative required
- 5. Other costs - No narrative required

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 (Tabular dollars in thousands. Narrative material in whole dollars.)

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|--|--|
| 1. Title and location of project: Fire protection improvements (Phase II)<br>Brookhaven National Laboratory (BNL)<br>Upton, New York | 2. Project No.: 86-R-726   |
| 3. Date A-E work initiated: 2nd Qtr. FY 1986   | 5. Previous cost estimate: None<br>Date: None  |
| 3a. Date physical construction starts: 3rd Qtr. FY 1986  | 6. Current cost estimate: \$ 3,000<br>Less FY 1984 PE&D:            0<br>Net cost estimate:            \$ 3,000<br>Date: December 1987 |
| 4. Date construction ends: 4th Qtr. FY 1989  |  |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1986	\$ 3,000	\$ 481	\$ 481	\$ 127
	1987	0	1,680	1,680	486
	1988	0	375	375	1,119
	1989	0	464	464	1,268

8. Brief Physical Description of Project

This project provides for the design, fabrication and installation of various fire protection improvements affecting over 210,000 square feet of building space. The improvements consist of:

1. Providing automatic sprinkler protection in basement, laboratories and storage areas of facilities designated as high loss potential areas. Areas included are Building 510, 555, 815, 830, 901 and 928.

## CONSTRUCTION PROJECT DATA SHEETS

- 
1. Title and location of project: Fire protection improvements (Phase II)  
Brookhaven National Laboratory (BNL)  
Upton, New York
2. Project No.: 86-R-726
- 

8. Brief Physical Description of Project (continued)

2. Provide complete or partial automatic sprinkler protection (either new, or extension of existing systems) in buildings of combustible contents and/or construction which have a direct impact or exposure to DOE programs. These include Buildings 130, 179, 211, 355, 356, 480, 610 and 923.
3. Transferring the existing fire alarm panels from BNL's old telegraph system to BNL multiplexed central alarm station (completion of a multiplexed central alarm station is scheduled in FY 1985). This will eliminate basic operational deficiencies in the existing system and bring BNL into full compliance with general industrial standards and DOE guidelines.
4. Raising the level of fire protection at Building 30 (Brookhaven Center) and other miscellaneous buildings to improve the life safety aspects. These improvements include: modifications to exits to comply with the National Fire Protection Association (NFPA) 101 (the Life Safety Code), extending sprinkler protection into unprotected areas, installing fire extinguishing systems above localized areas of high hazards (i.e., grills, deep fat fryers).

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. Wetpipe system on 100 sq. ft. spacing will be used in heated areas. Dry pipe systems will be used for unheated or partially heated areas. Water supplies will be taken from the existing BNL site water distribution system.

Transferring the fire alarm system to BNL's new central station facility will include all the work necessary to comply with the National Fire Code's 72 Series and DOE Orders.

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. Only key facilities have been included. Key facilities are defined as:

- a. Buildings containing operations directly involved in DOE program activities; or

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Fire protection improvements (Phase II) Brookhaven National Laboratory (BNL) Upton, New York	2. Project No.: 86-R-726
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9. Purpose, Justification of Need for, and Scope of Project (continued)

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. Automatic sprinkler protection has been proposed over fire detection since the above factors were especially unfavorable (i.e., difficult fire department access, over one million dollars loss potential, potential fire spread is great, program impact is severe).

The Gamewell telegraph portions of the system are in excess of 25 years old. Maintenance is high, alarm information provided is limited, expansion is limited and costly. The telegraph system does not indicate when a field unit resets nor does it indicate when a local system is in trouble. Transferring the fire alarm from the Gamewell System to the new multiplexed system will satisfy DOE requirements and provide an easy expandable, economical alarm system.

10. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design, and inspection at approximately 12% of construction costs, item b.....		\$ 285
b. Construction costs.....		2,370
1. Sprinkler system installation into existing building (approximately 210,000 sq. ft. at \$360/head).....	\$ 1,125	
2. 13 new water mains with trenching control valves and wet taps (approximately 1,200 feet at \$90 per ft.).....	219	
3. Connect sprinkler alarms into existing fire alarm system (15 risers at \$8,400 each).....	126	
4. Transfer fire alarm to new site protective signaling system (150 buildings at \$6,000 each).....	900	
Subtotal.....		<u>2,655</u>
c. Contingency at approximately 13% of above costs (Items a & b).....		345
Total estimated cost.....		<u>\$ 3,000</u>



CONSTRUCTION PROJECT DATA SHEETS

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

2. Project No.: 86-R-726

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11. Method of Performance

Design and inspection will be performed under one or more negotiated architect-engineer contracts with firms 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.

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.

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 MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

- |  |   |
|--|---|
| 1. Title and location of project: Medical facility<br>Lawrence Livermore National Laboratory (LLNL)<br>Livermore, California | 2. Project No.: 85-R-706  |
| 3. Date A-E work initiated: 1st Qtr. FY 1985   | 5. Previous cost estimate: None<br>Date: none   |
| 3a. Date physical construction starts: 1st Qtr. FY 1986  | 6. Current cost estimate: \$ 7,300<br>Less amount for CP&D: 0<br>Net cost estimate: \$ 7,300<br>Date: December 1987 |
| 4. Date construction ends: 1st Qtr. FY 1989  |   |

7. Financial Schedule

<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 7,300	\$ 500	\$ 500	\$ 196
1986	0	2,694	2,694	338
1987	0	3,644 <sup>a/</sup>	3,644 <sup>a/</sup>	2,374
1988	0	150	150	1,662
1989	0	312	312	630
1990	0	0	0	2,100

8. Brief Physical Description of Project

This project will provide a 25,600 gross square foot building for a new and expanded facility for Health Services and will house all of the 32 medical staff and support personnel. The functions accommodated in this space will be a waiting area, receptionist, interview rooms, administrative offices, records area, health maintenance offices, physical examination rooms, observation room, emergency treatment (major and minor), diagnostic laboratories, specimen rooms, X-ray room, dark room/process lab, autoclave and clean hold area, ambulance entry, personnel decontamination facility, eye safety examination rooms, toilets, storage and equipment rooms.

<sup>a/</sup>\$44,000 reprogrammed from prior year closed out projects also at LLNL.

## CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Medical facility  
Lawrence Livermore National Laboratory (LLNL)  
Livermore, California

2. Project No.: 85-R-706

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8. Brief Physical Description of Project (continued)

The building will be designed to relate to the existing nearby major facilities and will be constructed of fire-resistive materials. Fire sprinkler system as well as other safety devices, will be installed. Normal medical laboratory building utilities, heating, ventilation, power, lighting, and communication systems will be provided. The building will be cooled by mechanical refrigeration. In addition, the decontamination area will require special ventilation, sewage retention tanks, and floor treatment. Energy conserving design will be utilized throughout the facility.

Normal site utilities will be extended from mains and connections to storm and sanitary sewers will be made. Electrical power will be extended from high voltage feeders to a new substation serving this building. Area lighting will be installed for safety and security. Site development will comply with the Master Site Plan and will include grading, paving, off-street parking, curbs, gutters, sidewalks, fencing, security screens, and minimal landscaping.

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

Adequate health service support to the over 7600 employees of Lawrence Livermore National Laboratory (LLNL) primarily consists of two major elements. First, preventative approaches to both the physical and mental health of the work-force. This is accomplished through performance of over 3500 physical examinations a year, attention to the potential hazards of one of the country's foremost applied physics and engineering facilities and support to those who may be unduly stressed by working in such an environment. Second, is the availability of adequate emergency response to a very broad spectrum of hazards ranging from intense radioactivity, through almost every possible chemical, mechanical and electrical risk, to the "normal" falls, cuts, etc., that go with a dynamic population that includes over a thousand contractor employees in addition to the LLNL staff. Although blessed with one of the best safety records of the national laboratories, the health services facility must be prepared for major incidents.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Medical facility  
 Lawrence Livermore National Laboratory (LLNL)  
 Livermore, California

2. Project No.: 85-R-706

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

The current health facility is housed in a 40 year old World War II barracks building that is shared with the South Badge Office. It was barely adequate for a medical staff of less than 20 and a population of less than 5,000. Today the building limits physical examinations to approximately two thirds of the DOE guidelines for a laboratory of LLNL's size. Several other health services required by DOE order, DOT regulation, California code, American National Standards Institute (ANSI) standards, and LLNL policy are currently not being provided due to the physical restraints of the current building. For example, in the event of persons being contaminated with radioactive, toxic, or carcinogenic materials, they cannot be adequately treated without significant risk to the current facility and attending personnel. A special unit needs to be constructed to deal with this particular type of emergency situation. The present facility is generally not capable of handling a large variety of emergency situations nor a large number of casualties.

10. Details of Cost Estimate\*

a. Engineering, design, and inspection at approximately 13% of construction costs .....		\$ 700
1) Title I & II .....	\$ 400	
2) Title III .....	300	
b. Construction costs .....		5,550
1) Improvements to land including grading, paving, walks and landscaping .....	550	
2) Buildings Medical, 25,600 sq. ft. at \$162 per sq. ft.....	4,150	
3) Utilities, including mechanical, power, communications, storm and sanitary sewer.	850	
c. Standard equipment .....		140
d. Relocation cost .....		100
Subtotal .....		\$ 6,490
f. Contingency at approximately 12% of other costs (except item a. and c. above) .....		810
Total estimated cost.....		\$ 7,300

\*Based on complete conceptual design.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Medical facility Lawrence Livermore National Laboratory (LLNL) Livermore, California	2. Project No.: 85-R-706
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11. Method of Performance

This project will be designed and constructed under a procedure commonly referred to as turnkey contracting. The project will be competitively bid with each bidder submitting a design and cost proposal. Minor work will be performed by LLNL forces.

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

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	Total
a. Total project costs								
1. Total facility costs								
a. Construction line item ....	\$ 0	\$ 196	\$ 338	\$ 2,374	\$ 1,662	\$ 630	\$ 2,100	\$ 7,300
b. CP&D .....	0	0	0	0	0	0	0	0
c. Expense funded equipment ..	0	0	0	0	0	0	0	0
d. Inventories .....	0	0	0	0	0	0	\$ 0	0
Total direct costs .....	\$ 0	\$ 196	\$ 338	\$ 2,374	\$ 1,662	\$ 630	\$ 2,100	\$ 7,300
2. Other project costs								
a. R&D necessary to complete construction .....	120	0	0	0	0	0	0	120
b. Other project related costs	0	0	0	0	0	0	0	0
Total other project costs .....	120	0	0	0	0	0	0	120
Total project costs .....	\$ 120	\$ 196	\$ 338	\$ 2,374	\$ 1,662	\$ 630	\$ 2,100	\$ 7,420
b. Other related annual costs (estimated life of facility: 40 years)								
1. Facility operating costs .....							\$ 230	
2. Programmatic operating expenses directly related to the facility .....							3,280	
3. Capital equipment not related to construction but related to the programmatic effort in the facility .....							300	
4. GPP or other construction related to programmatic effort in the facility .....							100	
5. Other costs .....							0	
Total other related annual funding costs .....							\$ 3,910	

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Medical facility Lawrence Livermore National Laboratory (LLNL) Livermore, California	2. Project No.: 85-R-706
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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

- a. Total project funding
  - 1. Total facility costs
    - a. Construction line item - No narrative required.
    - b. Expense funded equipment - No narrative required.
    - c. Inventories - No narrative required.
  - 2. Other project funding
    - a. R&D necessary to complete construction  
Total funding in this classification represents the conceptual design cost and other studies determined to be necessary.
    - b. Other related project cost - No narrative required.
- b. Total related-funding requirements
  - 1. Facility operating costs - Operating costs of the facility are estimated to be \$226,000 per year including \$92,900 escalation (based on FY 1982 average maintenance and utility cost of \$5.20 per sq. ft. escalated to \$8.83 in FY 1987. Maintenance cost escalated at 7% per annum, and utility cost escalated at 15% per annum).
  - 2. Programmatic operating expenses directly related to the facility - This estimate is for 32 total programmatic and support personnel at \$102,540 average per person in FY 1987. Ninety percent of these people are presently housed in existing scattered buildings and trailers and will be moved to this new facility. The operating funds for these people are a normal part of the past and current programs. The remaining 10 percent represent growth projected to FY 1987. Funds for this growth have been included in program projections.

CONSTRUCTION PROJECT D&k00HA TA SHEETS

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1. Title and location of project: Medical facility  
Lawrence Livermore National Laboratory (LLNL)  
Livermore, California

2. Project No.: 85-R-706

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

3. Capital equipment not related to construction but related to the programmatic effort in the facility - This is an average annual estimate which includes both the small items needed for continuous operation of the facility and the occasional large item over \$100,000 which cannot be described at this time, but can be predicted as needed to maintain technical excellence in efforts conducted in the facility.
4. Maintenance, repair, GPP or other construction related to programmatic effort - None
5. Other costs - No narrative required.

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MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Hanford site fire alarm system upgrade Richland, Washington	2. Project No.: 85-R-707
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None Date: none
3a. Date physical construction starts: 2nd Qtr. FY 1986	6. Current cost estimate: \$ 4,850 Less amount for PE&D: 0
4. Date construction ends: 4th Qtr. FY 1989	Net cost estimate: \$ 4,850 Date: December 1987

7. Financial Schedule

<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 4,850	\$ 1,300	\$ 1,300	\$ 91
1986	0	1,708	1,708	707
1987	0	892	892	2,504
1988	0	575	575	687
1989	0	375	375	861

8. Brief Physical Description of Project

This project provides for the design, procurement and construction of an upgraded fire alarm system which will be commensurate with required levels of protection for the Hanford Site. The project will replace all existing master alarm boxes and street boxes with radio boxes, replace alarm receiving equipment and consoles at the fire stations, replace/upgrade existing auxillary fire protection system, and provide a computer aided dispatch system.



CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Hanford site fire alarm system upgrade  
Richland, Washington

2. Project No.: 85-R-707

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8. Brief Physical Description of Project (continued)

This project will replace approximately 240 master alarm boxes and 50 street boxes, which are distributed through-out the site. This will require additional equipment to interface the new master boxes with the existing detector circuits in the facilities. The existing alarm receiving equipment at the fire stations will be replaced with new equipment compatible with the new alarm boxes. Significant features of the new alarm receiving equipment includes printout of facility location and alarming zone within the facility. This equipment will be supplemented with a new computer aided dispatching system. This will increase the efficiency of responding emergency personnel by providing information not available with the existing system. This includes information such as type of occupancy, recommended extinguishing agents, and adjacent conditions.

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

The purpose of this project is to update the existing fire alarm system with a more reliable and efficient system. There has been no significant overhaul of the Hanford fire alarm system since the site was originally established in the early 1940's. Some system components are approaching 50 years in age. Repair of components is difficult at best due to the lack of spare parts. Overhead conductors are generally in excess of 20 years old with significant amounts in excess of 30 years old. Due to the normal aging process the insulation of these conductors is brittle and breaks easily leaving conductors exposed and permitting faults in the system. In some locations, alarms are transmitted to the fire stations on underground conductors. Major portions of these lines are uncharted and are subject to dig-ups during construction and maintenance activities.

Due to deterioration and age of the system components, numerous false and nuisance alarms as well as ground faults occur. Records of alarm signals for calendar years 1979, 1980 and 1981 indicate alarms due to electrical problems, malfunctions, atmospheric phenomenon, and equipment failures ranged between 28 and 37 percent of the total number of alarms received. It is estimated that the proposed system could eliminate 50 percent of these alarms.

As the facilities at the site have been increased in size as well as number, additions to the fire alarm reporting system have been made to cover them. Unfortunately, by necessity, requirements of the National Fire Codes have been violated. These violations concern connection of detectors to master alarm boxes in an unacceptable manner, inadequate annunciation, and inappropriate alarm receiving at the fire stations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Hanford site fire alarm system upgrade  
 Richland, Washington

2. Project No.: 85-R-707

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

The need for the fire alarm system upgrade is based on an audit report done in June 1982 by consultants specializing in fire protection and safety engineering. The audit report identifies 30 categories of deficiencies within the existing fire alarm system. An engineering study addressed alternative solutions for correcting existing deficiencies. Through the site survey, overall system analysis, and the consultant's fire alarm system expertise, it was concluded that to achieve compliance with National Fire Protection Association (NFPA), ensure system reliability, future flexibility and ease of operation, a Radio fire alarm system alone fulfilled these requirements.

Delay of this project will increase the risk of serious fire accidents due to continued aging of the system and its components. Also, maintenance costs of the existing system will continue to increase.

10. Details of Cost Estimate

	Item Cost	Total Cost
a. Engineering design and inspection at approximately 13% of construction costs .....		\$ 500
b. Construction costs .....		3,720
(1) Construction (includes equipment and labor) .....	\$ 1,910	
c. Standard equipment includes 6 consoles (\$54,000/ea.) computer aided dispatch system (\$204,000) and approximately 278 radio alarm boxes (\$4,600/ea.) .....	1,810	
Subtotal .....		\$ 4,220
d. Contingency at approximately 15% of above cost .....		630
Total estimated cost.....		\$ 4,850

11. Method of Performance

Design, inspection, and construction will be accomplished by fixed-price contracts awarded on the basis of competitive bidding. It will be a design, procure and install contract as presently planned.

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

Not required. TEC is less than \$5,000,000.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Hanford site fire alarm system upgrade  
Richland, Washington

2. Project No.: 85-R-707

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

Not required. TEC is less than \$5,000,000.

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MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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|---|--|
| 1. Title and location of project: Road repair, various locations (ANL, INEL, LBL, RL) | 2. Project No.: 84-ER-103  |
| 3. Date A-E work initiated: 2nd Qtr. FY 1984  | 5. Previous cost estimate: \$16,000<br>Date: August 1982   |
| 3a. Date physical construction starts: 4th Qtr. FY 1984                               | 6. Current cost estimate: \$17,751<br>Less amount of PE&D: 0<br>Net Cost Estimate: \$17,751<br>Date: December 1987 |
| 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 <sup>a/</sup>	\$ 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 <sup>b/</sup>	3,122 <sup>b/</sup>	3,960
	1988	0	470	470	705
	1989	0	490	490	941
	1990	0	446	446	311

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:

<sup>a/</sup> \$3,500,000 reprogrammed from 82-E-306 in FY 1984.

<sup>b/</sup> \$1,315,000 reprogrammed from prior year closed out projects also at Idaho.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Road repair, various locations (ANL, INEL, LBL, RL) 2. Project No.: 84-ER-103

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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 provide standard 12-foot lanes. Shoulder surfaces will be treated and widened to provide the standard design width. Acceleration, deceleration, 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

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1. Title and location of project: Road repair, various locations (ANL, INEL, LBL, RL)      2. Project No.: 84-ER-103

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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 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

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1. Title and location of project: Road repair, various locations (ANL, INEL, LBL, RL)      2. Project No.: 84-ER-103

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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  $-40^{\circ}\text{F}$  causing surface course brittleness and shrinkage leading to extensive cracking, subsequent moisture penetration and subsurface failure.
  - o High summer temperatures ranging to  $100^{\circ}\text{F}$  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 road way.

Improvement of the laboratory roading 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 distance, 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 No.: 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\*

	<u>Richland</u>	<u>INEL</u>	<u>LBL</u>	<u>ANL</u>	<u>Total</u>
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.....	<u>5,951</u>	<u>6,645</u>	<u>1,210</u>	<u>1,800</u>	<u>15,606</u>
c. Contingency.....	800	955	190	200	2,145
Total estimated cost.....	<u>\$ 6,751</u>	<u>\$ 7,600</u>	<u>\$ 1,400</u>	<u>\$ 2,000</u>	<u>\$17,751</u>

\*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

1. Title and location of project: Road repair, various locations (ANL, INEL, LBL, RL)

2. Project No.: 84-ER-103

11. 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.

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

	<u>Prior</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>Total</u>
	<u>Years</u>								
a. Total project costs									
1. Total facility costs									
(a) Construction line									
item.....	\$ 0	\$ 737	\$7,098	\$3,999	\$3,960	\$ 705	\$ 941	\$ 311	\$17,751
(b) PE&D.....	0	0	0	0	0	0	0	0	0
(c) Expense funded									
equipment.....	0	0	0	0	0	0	0	0	0
(d) Inventories.....	0	0	0	0	0	0	0	0	0
Total facility costs..	\$ 0	\$ 737	\$7,098	\$3,999	\$3,960	\$ 705	\$ 941	\$ 311	\$17,751

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Road repair, various locations (ANL, INEL, LBL, RL)

2. Project No.: 84-ER-103

12. Funding Schedule of Project Funding and Other Related Funding Requirements (continued)

2. Other project costs										
(a) R&D necessary to complete construction.	\$ 30	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 30
(b) Other project related costs.....	0	0	0	0	0	0	0	0	0	0
Total other project funding.....	30	0	0	0	0	0	0	0	0	30
Total project costs (1 and 2).....	\$ 30	\$ 737	\$7,098	\$3,999	\$3,960	\$ 705	\$ 941	\$ 311	\$17,781	

Annual Cost

b. Other related annual costs (estimated life of project: 25 years)	
1. Facility operating costs.....	\$ 50
2. Programmatic operating expenses directly related to the facility.....	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility.....	0
4. GPP or other construction related to programmatic effort in the facility.....	0
Total other costs.....	\$ 50

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

- a. Total project costs:
  - 1. Total Facility:
    - a) Construction Line Item
    - b) PE&D - No PE&D required.
    - c) Expense Funded Equipment - There is no expense funded equipment.
    - d) Inventories - There are no inventories required.
  - 2. Other project funding:
    - a) Research and Development is not necessary for this project. The amount shown covers conceptual design activities.
    - b) Other Project Related Costs - No other project related costs are anticipated.

CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Road repair, various locations (ANL, INEL, LBL, RL)      2. Project No.: 84-ER-103

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

b. Total related funding requirements:

1. These costs are the average maintenance cost of roads at the various sites. They are based on a cost per square foot of new surface escalated to 1987.
2. Programmatic Operating Expenses - None
3. Capital Equipment not Related to Construction - None
4. GPP or Other Construction Related to Programmatic Effort - No GPP funds are required by this project.
5. Other Costs - No other costs are anticipated.

DEPARTMENT OF ENERGY  
1989 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.: 89-R-770
3. Date A-E work initiated: 1st Qtr. FY 1989	5. Previous cost estimate: None Date:
3a. Date physical construction starts: 2nd Qtr. FY 1989	6. Current cost estimate: \$ 2,500 Less amount for PE&D:        0 Net cost estimate:            \$ 2,500 Date: December 1987
4. Date construction ends: 4th Qtr. FY 1990	

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Obligations</u>	<u>Costs</u>			
			<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>After FY 1989</u>
	1989	\$ 2,500	\$ 0	\$ 0	\$ 625	\$ 1,875

8. Brief Physical Description of Project

These projects provide for the many miscellaneous alterations, additions, modifications, replacements, and non-major new construction items required to reduce or eliminate environmentally harmful discharges from ORNL.

- o Upgrade Transuranium Processing Plant Stack Fans..... \$ 400

This project provides the replacement of two vessel off-gas (VOG) fans and two cell off-gas (COG) fans and associated ductwork that discharge air from the Transuranium Processing Plant with new units with improved corrosion resistance. Work includes the removal and disposal of the old fans and ductwork and the procurement and installation of new fans and ductwork.



CONSTRUCTION PROJECT DATA SHEETS

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

2. Project No.: 89-R-770

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

o Upgrade Transuranium Processing Plant Stack Fans

These fans and ductwork are exposed to chlorides and nitric acid which may cause corrosion. As such, fan failure could occur due to corrosion or metal fatigue that could require operation with the standby fan only until replacement could be obtained.

o Process Improvements - Biology Wastewater Treatment Facility

If it is determined that these contaminants exist in the process wastewater above the current Y-12 National Pollutant Discharge Elimination System (NPDES) permit limits, the potential exists for shutdown of the Biology Division operations until the contaminants have been eliminated or reduced below permit levels.

o Gas Cylinder Disposal Facility

The existing practices of disposing of gas cylinders which are leaking or have stuck valves is environmentally unacceptable. Staging areas and treatment facilities capable of safely disposing of hazardous gases which comply with the Clean Air Act are required.

o Expanded Mixed Waste Storage Capacity

The existing facility was designed on the basis of mixed waste generation rate forecasts developed in FY 1983-1984. Actual generation rates have been much higher than the forecasts, and the backlog of wastes needing adequate storage has exceeded the current storage capacity. Failure to provide the additional capacity could lead to curtailment of laboratory operations which generate mixed wastes.

CONSTRUCTION PROJECT DATA SHEETS

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

2. Project No.: 89-R-770

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

o Equipment Decontamination Facility

This risk of construction and other large equipment becoming contaminated at the ORNL site has greatly increased due to the extensive well drilling operations and remedial actions programs currently in process and planned. There is no existing facility on-site which can provide the required protection for the health and safety of personnel and the environment for these decontamination operations, and the equipment cannot be moved off-site until it has been decontaminated. In addition, the facility can also provide some capital savings by eliminating the need to purchase and dispose of contaminated equipment which cannot now be refurbished and reused.

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  
1989 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: Liquid low-level waste collection and transfer systems upgrade<br>Oak Ridge National Laboratory (ORNL)<br>Oak Ridge, Tennessee | 2. Project No.: 88-R-830  |
| 3. Date A-E work initiated: 1st Qtr. FY 1988<br><br>3a. Date physical construction starts: 2nd Qtr. FY 1989<br><br>4. Date Construction ends: 4th Qtr. FY 1991   | 5. Previous cost estimate: \$35,000<br>Date: February 1987<br><br>6. Current cost estimate: \$35,000<br>Less amount for PE&D: <u>0</u><br>Net cost Estimate: <u>\$35,000</u><br>Date: December 1987 |

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	\$ 2,400
	1989	0	11,787	11,787	8,100
	1990	0	10,500	10,500	17,600
	1991	0	7,913	7,913	6,900

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 corrosion. The tanks have provisions for flow control, pH monitoring, and temperature monitoring and will be



CONSTRUCTION PROJECT DATA SHEETS

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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
- 

8. Brief Physical Description of Project (continued)

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

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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
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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

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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
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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

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 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. <sup>252</sup>Cf) 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.....		<u>28,000</u>
c. Contingency at approximately 25% of above costs.....		7,000
Total estimated cost.....		<u>\$35,000</u>

\* 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
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11. 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.

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

	<u>Prior Yrs.</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991</u>	<u>Total</u>
a. Total project costs						
1. Total facility costs						
(a) Construction line item..	\$ 0	\$ 2,400	\$ 8,100	\$17,600	\$ 6,900	\$35,000
Total direct costs.....	\$ 0	\$ 2,400	\$ 8,100	\$17,600	\$ 6,900	\$35,000
2. Other project funding						
(a) R&D necessary to complete construction.....	0	0	0	0	0	0
- Conceptual design.....	600	0	0	0	0	600
- Design criteria and advance procurement report.....	600	200	0	0	0	800
(b) Other project related costs.....	0	0	0	0	0	0
Total other project funding..	1,200	200	0	0	0	1,400
Total project costs.....	\$ 1,200	\$ 2,600	\$ 8,100	\$17,600	\$ 6,900	\$36,400*
(Items 1 and 2)						

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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12. Funding Schedule of Project Funding and Other Related Funding Requirements (continued)

b. Total related annual costs (estimated life: 30 years)	
1. Facility operating costs.....	\$ 0**
2. Programmatic operating expenses not directly related to facility.....	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility.....	0
4. GPP or other construction related to the programmatic effort in the facility.....	0
5. Other costs.....	0
Total related annual costs.....	\$ 0

\* Costs are projected costs, not obligations, for each fiscal year.

\*\*The proposed project is not expected to significantly affect the current operating cost for ORNL. Additional operating costs are not needed as a result of this project.

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

a. Total project funding

1. Total facility costs  
No narrative required.

2. Other project funding

(a) R&D necessary to complete construction

Conceptual Design--the conceptual design was completed in February 1986 at a cost of \$600,000.

- Design Criteria and Advance Procurement Report

Approximately \$800,000 will be spent in FY 1987 (\$600K) and FY 1988 (\$200K) to prepare the design criteria and Advance Procurement Report.

(b) Other project related costs

No narrative required.

CONSTRUCTION PROJECT DATA SHEETS

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

b. Other related funding requirements

The useful life of the LLW-CAT system is projected to be 30 years.

1. Facility operating cost  
The proposed project is not expected to significantly affect the current operating cost for ORNL. Additional operating funds are not needed as a result of this project.
2. Programmatic operating expenses not directly related to the facility  
No narrative required.
3. Capital equipment not related to construction but related to the programmatic effort in the facility.  
No narrative required.
4. GPP or other construction related to the programmatic effort in the facility  
No narrative required.
5. Other costs  
No narrative required.

DEPARTMENT OF ENERGY  
1989 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: Non-radiological process waste treatment project<br>Oak Ridge National Laboratory (ORNL)<br>Oak Ridge, Tennessee | 2. Project No.: 86-R-801   |
| 3. Date A-E work initiated: 1st Qtr. FY 1986   | 5. Previous cost estimate: \$3,000*<br>Date: December 1984   |
| 3a. Date physical construction starts: 3rd Qtr. FY 1987  | 6. Current cost estimate: \$18,000<br>Less amount of PE&D: 0<br>Net Cost Estimate: \$18,000<br>Date: December 1987 |
| 4. Date construction ends: 1st Qtr. FY 1990  |  |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1986	\$ 3,000	\$ 2,887	\$ 2,887	\$ 1,552
	1987	15,000	7,000	7,000	2,767
	1988	0	7,000	7,000	7,148
	1989	0	1,113	1,113	4,300
	1990	0	0	0	2,233

8. Brief Physical Description of Project

A Non-Radiological Wastewater Treatment Project (NRWTP) is underway for the Oak Ridge National Laboratory (ORNL) that will address regulatory environmental compliance concerns. Among these concerns are certain non-radiological process waste streams which are currently discharged untreated into area creeks and the active use of surface impoundments for process wastewater. This project proposed to modify process systems (eliminate nitric acid regeneration of demineralizers) and to collect and treat these streams as required to meet

\*Previous cost estimate of \$3,000,000 provided for Title I and II engineering design FY 1986.



CONSTRUCTION PROJECT DATA SHEETS

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1. Title and location of project: Non-radiological process waste treatment project  
Oak Ridge National Laboratory (ORNL)  
Oak Ridge, Tennessee

2. Project No.: 86-R-801

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8. Brief Physical Description of Project (continued)

discharge parameters as established by the Environmental Protection Agency (EPA) and the State of Tennessee and to eliminate the discharge of hazardous wastewater into surface impoundments. The NRWTP will provide required collection, treatment, and monitoring facilities based on wastewater characterization and treatability studies to meet effluent criteria established by regulatory agencies.

Physical construction will include pumps, tanks, and piping to transfer wastewater to treatment facilities, tankage to replace surface impoundments process modification (replacement of nitric acid demineralizer regeneration systems) to reduce pollutant loading, special equipment to accomplish the desired handling and treatment of wastewater and resultant solid waste, computerized monitoring and control equipment, and new buildings to house equipment and support facilities.

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

The purposes of this project are to resolve the major Clean Water Act concerns at ORNL with respect to the discharge of nonradiological process wastewater and to eliminate the discharge of hazardous wastewater into surface impoundments by November 8, 1988, in compliance with provisions of the reauthorized Resource Conservation and Recovery Act (RCRA). Current liquid effluents are not in compliance with the Clean Water Act and the Tennessee Water Quality Act. The National Pollutant Discharge Elimination System (NPDES) permit issued by the EPA and state will identify new monitoring and effluent points and discharge limits. The permit will require that all process wastewater be treated. This project will provide treatment which will ensure ORNL's compliance with discharge parameters. The project will also provide tankage to eliminate the discharge of process wastewater into surface impoundments. Cleanup of these impoundments will be provided under other projects.

This project will treat the effluent streams from ORNL facilities including the Process Waste Treatment Plant (Building 3544), Central Research and Administration (4500 Area), Environmental Sciences Laboratory (Building 1505), Radioisotope Production Laboratories (3000 Area, non-radiological effluents), various flows from Melton Valley (High-Flux Isotope Reactor and the Transuranium Processing Plant, non-radiological effluents), and other waste streams.

### CONSTRUCTION PROJECT DATA SHEETS

<p>1. Title and location of project: Non-radiological process waste treatment project Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee</p>	<p>2. Project No.: 86-R-801</p>
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9. Purpose, Justification of Need for, and Scope of Project (continued)

Considered a major stream, the effluent from Building 3544, is currently being treated by ion exchange to remove only radioactivity but has exceeded NPDES limits in several parameters (dissolved solids, chemical oxygen demand (COD), and nitrates). Other streams are not currently treated and surpass the NPDES requirements and must be treated. The current waste treatment plant (Building 3544), even with modifications, does not have the capability to treat all exceeded parameters, and is designed for a lower feed rate than will be required to treat the combined feed streams. Therefore, it is necessary to build a new wastewater treatment system with the capability to treat these streams.

10. Details of Cost Estimate\*

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design, and inspection at approximately 24% of construction costs, item b.....		\$ 2,700
b. Construction costs.....		11,280
(1) Land improvements.....	\$ 250	
(2) New buildings.....	605	
(3) Special facilities.....	9,420	
(4) Outside utilities.....	1,005	
Subtotal.....		13,980
c. Contingency at approximately 29% of above costs.....		4,020
Total estimated cost.....		\$ 18,000

\*This estimate is from the Conceptual Design Report completed in May 1985.

11. Method of Performance

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

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Non-radiological process waste treatment project Oak Ridge National Laboratory (ORNL) Oak Ridge, Tennessee	2. Project No.: 86-R-801
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12. Funding Schedule of Project Funding and Other Related Funding Requirements

	<u>Prior Years</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>	<u>Total</u>
a. Total project costs						
1. Total facility costs						
(a) Construction line item.....	\$ 1,552	\$ 2,767	\$ 7,148	\$ 4,300	\$ 2,233	\$ 18,000
(b) PE&D.....	0	0	0	0	0	0
(c) Expense funded equipment.....	0	0	0	0	0	0
(d) Inventories.....	0	0	0	0	0	0
Total facility costs.....	1,552	2,767	7,148	4,300	2,233	18,000
2. Other project costs						
(a) R&D necessary to complete construction.....	0	0	0	0	0	0
(b) Other project related costs.....	350	0	0	0	0	350
Total other project costs.....	350	0	0	0	0	350
Total project costs.....	\$ 1,902	\$ 2,767	\$ 7,148	\$ 4,300	\$ 2,233	\$ 18,350*

\*This total includes \$350,000 for a Conceptual Design completed in May 1985.

b. Other related annual costs (estimated life of project: 20 years)	
1. Facility operating costs.....	\$ 1,600
2. Programmatic operating expenses directly related to the facility.....	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility.....	0
4. GPP or other construction related to programmatic effort in the facility.....	0
5. Other costs.....	600*
Total related annual costs.....	\$ 2,200**

\*This cost is a one-time cost in FY 1985.

\*\*These costs are expressed in FY 1984 dollars and do not include overhead.

CONSTRUCTION PROJECT DATA SHEETS

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|---|--------------------------|
| 1. Title and location of project: Non-radiological process waste<br>treatment project<br>Oak Ridge National Laboratory (ORNL)<br>Oak Ridge, Tennessee | 2. Project No.: 86-R-801 |
|---|--------------------------|
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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

- a. Total project funding
  - 1. Total facility costs
    - a) Construction line item  
No narrative required.
    - b) PE&D  
No narrative required.
    - c) Expense funded requirement  
No narrative required.
    - d) Inventories  
No narrative required.
  - 2. Other project funding:
    - a) R&D necessary to complete construction.  
No narrative required.
    - b) Conceptual design costs  
Approximately \$350,000 will be spent in FY 1985 to provide a Conceptual Design.

b. Total related funding requirement

The useful life of the NRWTP is 20 years.

- 1. Facility operating costs - these estimated costs include chemicals and supplies, labor costs, utilities, and waste disposal.
- 2. Programmatic operating expenses not directly related to the facility  
No narrative required.
- 3. Capital equipment not related to construction but related to the programmatic effort in the facility  
No narrative required.
- 4. GPP or other construction related to the programmatic effort in the facility  
No narrative required.
- 5. Other costs - this estimated cost is to conduct waste stream characterization, treatability studies, effluent definition, and other support activities necessary prior to Title I and II design of this project.