

DEPARTMENT OF ENERGY  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT

OVERVIEW

MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT

Attaining the R&D goals articulated in the National Energy Strategy (NES) involves significant use of Energy Research (ER) laboratory facilities. These include: Argonne National Laboratory (ANL), Brookhaven National Laboratory (BNL), Lawrence Berkeley Laboratory (LBL), Oak Ridge National Laboratory (ORNL), Pacific Northwest Laboratory (PNL), and other smaller dedicated ER laboratories. All facilities at these laboratories are government owned and represent a multi-billion dollar investment. Replacement costs in today's dollars of all active facilities at the ER laboratories are estimated to be over \$10 billion dollars. The average age of the laboratories' facilities is 30 years and plans indicate these laboratories will be heavily utilized throughout the 1990s and well into the 21st century.

Resources are required to preserve and maintain these facilities so they can carry out their respective missions in accordance with relevant regulations and DOE Orders. The MEL-FS program is designed to maintain infrastructure integrity at these facilities. The strategy of the MEL-FS program is to select and support projects necessary to: (1) maintain operations of the laboratories in a safe, cost effective, and productive manner; (2) reduce the backlog of facilities deficiencies; and (3) address Tiger Team remediations needs.

The MEL-FS program is composed of two subprograms. The General Purpose Facilities subprogram provides construction support for the rehabilitation and replacement of the general purpose facilities (GPF) at the ER laboratories. These construction projects have a total estimated cost (TEC) exceeding \$1.2 million and are directed at general purpose facilities which include general use, service and support facilities such as administrative space, cafeterias, general office/laboratory space, utility systems, sanitary sewers, roads, etc. This subprogram also begins implementation of an infrastructure replacement and upgrade initiative.

A new Tiger Team Remediations subprogram will provide support necessary to correct deficiencies identified in the Tiger Team reviews that are related to ER responsibilities. The comprehensive Tiger Team assessments, currently being conducted in the Department, examine environment, safety and health performance of its facilities and are conducted by a team of specialists from various DOE offices, contractors, and consultants organized into three subteams: environmental, sitewide safety and health assessment, and management. The subprogram is designed to alleviate increases in laboratory overhead rates and General Purpose Equipment (GPE), General Plant Projects (GPP) and General Purpose Facilities (GPF) funding levels, and to establish a program that will provide headquarters oversight of Tiger Team corrective actions related to ER responsibilities.

The benefits to be gained by supporting MEL-FS are: improved safety, security, and environmental compliance levels; reduced health risks; decreased operating costs and improved productivity; and continuity of operations. The program will help ensure that the general purpose facilities are adequate for the continued effective accomplishment of the Department's R&D mission today and in the future. The program is an appropriate Federal role reflecting the responsible management of the Government's real property.

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**LEAD TABLE**

**Multiprogram Energy Laboratories - Facilities Support**

<u>Activity</u>	<u>FY 1991 Enacted</u>	<u>FY 1992 Enacted</u>	<u>FY 1993 Base</u>	<u>FY 1993 Request</u>	<u>Program Change Request vs Base</u>	
					<u>Dollar</u>	<u>Percent</u>
<b>General Purpose Facilities</b>						
Construction .....	<u>\$23,605</u>	<u>\$23,891</u>	<u>\$23,891</u>	<u>\$56,700</u>	<u>\$32,809</u>	<u>137%</u>
Subtotal, General Purpose Facilities .....	<u>\$23,605</u>	<u>\$23,891</u>	<u>\$23,891</u>	<u>\$56,700</u>	<u>\$32,809</u>	<u>137%</u>
<b>Tiger Team Remediation</b>						
Capital Equipment .....	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$3,000</u>	<u>\$3,000</u>	<u>&gt;999</u>
Construction .....	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$7,000</u>	<u>\$7,000</u>	<u>&gt;999</u>
Subtotal, Tiger Team Remediation .....	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$10,000</u>	<u>\$10,000</u>	<u>&gt;999</u>
<b>Summary</b>						
Capital Equipment .....	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$3,000</u>	<u>\$3,000</u>	<u>&gt;999</u>
Construction .....	<u>\$23,605</u>	<u>\$23,891</u>	<u>\$23,891</u>	<u>\$63,700</u>	<u>\$39,809</u>	<u>167%</u>
Total Program .....	<u>\$23,605</u> a/	<u>\$23,891</u>	<u>\$23,891</u>	<u>\$66,700</u>	<u>\$42,809</u>	<u>179%</u>

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

a/ Total has been reduced by \$297 for FY 1991 sequester and \$130,000 for General Reduction.

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SUMMARY OF CHANGES

Multiprogram Energy Laboratories - Facilities Support

FY 1992 Appropriation.....	\$ 23,891
FY 1993 Base Adjustments.....	0
- Initiates 13 new projects and maintains schedules on 11 ongoing projects.....	32,809
- Initiates 5 line item construction projects required by Tiger Team plans.....	7,000
- Provides modern health physics equipment as identified in Tiger Team action plans particularly at ORNL.....	<u>3,000</u>
FY 1993 Congressional Budget Request.....	\$ 66,700

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KEY ACTIVITY SUMMARY

MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT

I. Preface: General Purpose Facilities

The program funds line-item construction projects designed to correct deficiencies in general purpose facilities at ER laboratories. This program was established in FY 1981 to support construction activities estimated to cost more than \$1.2M and currently contributes to infrastructure improvements at all Energy Research laboratories.

Facilities at these laboratories are government owned and represent an investment of over \$10 billion in replacement costs in today's dollars. The laboratories facilities are heavily utilized and received more than \$1 billion a year in operating funds to perform research and development and employ over 17,000 scientists, engineers, and other support staff. The ER laboratories range in age from 23 to 42 years. Resources are required to preserve and maintain these facilities so that they can carry out their respective missions in accordance with relevant regulations and DOE orders in a cost effective manner.

Energy Research long range plans indicate that its laboratories will be heavily utilized throughout the 1990s and into the 21st century. No major changes in ER's use of these laboratories are expected in the next ten years that would affect the viability or usefulness of any of the projects supported by MEL-FS.

Projects supported by this program are general use, service and support facilities such as administrative space, cafeterias, general office/laboratory space, utility systems, roads, etc. Support is coordinated with ER landlord programs that fund general plant projects (GPP), (i.e., projects with a TEC estimated at \$1.2 million or less) at these laboratories. Facility requirements are identified in laboratory Institutional Plans and Site Development Plans which addresses planned projects over a five to fifteen year planning horizon based on expected programmatic support. The program has prepared a Multi-Year Program Plan (5 year horizon) and in the latest plan has identified projects totalling over \$700 million.

The benefits to be gained by supporting the program are improved safety, security, and environmental compliance levels; reduced health risks; decreased operating costs and improved productivity; and continuity of operations.

II. A. Summary Table: General Purpose Facilities

Program Activity	FY 1991 Enacted	FY 1992 Enacted	FY 1993 Request	% Change
Construction.....	\$ 23,605	\$ 23,891	\$ 56,700	+137
Total, General Purpose Facilities	\$ 23,605	\$ 23,891	\$ 56,700	+137

II. B. Major Laboratory and Facility Funding

	FY 1991 Enacted	FY 1992 Enacted	FY 1993 Request	% Change
Ames Laboratory .....	\$ 0	\$ 1,500	\$ 1,557	+ 4
Argonne National Laboratory (East) .....	\$ 4,831	\$ 4,014	\$ 12,287	+206
Brookhaven National Laboratory .....	\$ 4,649	\$ 4,539	\$ 11,432	+152
Fermi National Accelerator Laboratory .....	\$ 0	\$ 0	\$ 0	0
Lawrence Berkeley National Laboratory .....	\$ 7,653	\$ 10,989	\$ 7,709	- 30
Oak Ridge National Laboratory .....	\$ 6,476	\$ 1,080	\$ 14,495	>999
Pacific Northwest Laboratory .....	\$ 0	\$ 1,700	\$ 7,500	+341
Stanford Linear Accelerator Laboratory .....	\$ 0	\$ 0	\$ 2,220	>999

III. Activity Descriptions: (New BA in thousands of dollars)

Program Activity	FY 1991	FY 1992	FY 1993
General Purpose Facilities			
Construction	Provided for the completion/continuation of 18 on-going projects (\$19,927) consistent with planned schedules and initiation of 1 seismic safety project. (\$3,678)	Supports the completion/continuation of 8 ongoing projects (\$11,593) consistent with planned schedules and initiation of 9 projects - 2 buildings rehabs, 1 building replacement, 1 fire safety and 5 utility projects (\$12,298).	Will provide for the completion/continuation of 11 ongoing projects (\$25,906) consistent with planned schedules and initiation of 13 new projects to continue modernization of infrastructure and reduction of the substantial backlog of facilities deficiencies. (\$30,794)
	\$ 23,605	\$ 23,891	\$ 56,700
General Purpose Facilities	\$ 23,605	\$ 23,891	\$ 56,700

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KEY ACTIVITY SUMMARY

MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT

I. Preface: Tiger Team Remediations

The Department has undertaken a uniform comprehensive process for assessing environment, safety and health performance of its facilities, referred to as the Tiger Team Assessment. Assessments are conducted by a team of specialists from various DOE offices, contractors, and consultants organized into three subteams. The subteams are: environmental, sitewide safety and health assessment, and management. Assessments have been completed at 6 ER laboratories and the balance of ER facilities will be reviewed in the next 2 years. After completion of the Tiger Team's assessment, the laboratory prepares an Action Plan to address corrective actions. The Action Plan identifies all the corrective actions needed to address the deficiencies with a schedule and estimated costs. The Action Plan is approved by the Department. This subprogram has been created to respond to the Secretary's desire to separately budget and manage activities in this area.

This new program has been developed to provide support necessary to help meet many of the one-time general purpose costs to correct deficiencies indicated in Tiger Team Action Plans that relate to ER responsibilities at DOE laboratories and to act in a timely manner. These one-time costs are primarily reflected in capital items. This program will help alleviate increases in GPE and GPF funding levels and provides appropriate Headquarters oversight of Tiger Team corrective actions related to ER responsibilities.

The benefits to be gained by supporting the program are: improved safety and environmental compliance levels and reduced health risks. This new subprogram will be discontinued when the activities called for in the action plans are completed, which is anticipated to be in the next 5 years, if level funding is provided.

II. A. Summary Table: Tiger Team Remediations

Program Activity	FY 1991 Enacted	FY 1992 Enacted	FY 1993 Request	% Change
Capital Equipment.....	\$ 0	\$ 0	\$ 3,000	>999
Construction.....	0	0	7,000	>999
<b>Total, Tiger Team Remediations</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 10,000</b>	<b>&gt;999</b>

II. B. Major Laboratory and Facility Funding

Argonne National Laboratory (East) .....	\$ 0	\$ 0	\$ 1,870	>999
Brookhaven National Laboratory .....	\$ 0	\$ 0	\$ 1,130	>999
Lawrence Berkeley National Laboratory .....	\$ 0	\$ 0	\$ 3,000	>999
Pacific Northwest Laboratory .....	\$ 0	\$ 0	\$ 1,000	>999

III. Activity Descriptions: (New BA in thousands of dollars)

Program Activity	FY 1991	FY 1992	FY 1993
Tiger Team Remediations			
Capital Equipment	No activity.	No activity.	Provide modern health physics equipment as identified in Action Plans particularly at ORNL. The instruments to be procured include air monitoring instruments, contamination monitoring instruments, ionizing radiation monitoring instruments, and hand and foot monitors. All the instruments are required to comply with findings of the Tiger Team reviews. (\$3,000)
	\$ 0	\$ 0	\$ 3,000
Construction	No activity.	No activity.	Initiate 5 new line item construction projects. See data sheets for a more detailed description. (\$7,000)
	\$ 0	\$ 0	\$ 7,000
Tiger Team Remediations	\$ 0	\$ 0	\$ 10,000

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KEY ACTIVITY SUMMARY

CONSTRUCTION PROJECTS

Multiprogram Energy Laboratories - Facilities Support

IV. A. Construction Project Summary

Project No.	Project Title	Total Prior Year Obligations	FY 1992 Appropriated	FY 1993 Request	Unappropriated Balance	TEC
<u>Multiprogram Energy Laboratories - General Purpose Facilities</u>						
93-E-336	HVAC Controls & Mechanical Systems Upgrade - Phase I (PNL)	\$0	\$0	\$1,000	\$2,000	\$3,000
93-E-333	Applied Science Center - Phase I (BNL)	0	0	500	3,000	3,500
93-E-332	Materials Handling Center (BNL)	0	0	3,270	0	3,270
93-E-329	Roofing Improvements (ORNL)	0	0	4,024	10,976	15,000
93-E-328	Central Research and Support Building (ORNL)	0	0	4,400	8,000	12,400
93-E-327	Safety and Support Services Facility (LBL)	0	0	2,980	6,920	9,900
93-E-326	Laboratory Addition - Building 205 (ANL)	0	0	620	5,130	5,750
93-E-325	Potable Water System Upgrade - Phase I (BNL)	0	0	3,500	1,750	5,250
93-E-316	Underground Power and Communication System Upgrade - Phase I (BNL)	0	0	1,400	2,200	3,600
93-E-314	Sitewide Conventional Substation Feeder Improvement (SLAC)	0	0	2,220	0	2,220
93-E-313	Electrical System Upgrade - Phase II (ANL)	0	0	3,000	2,100	5,100
93-E-311	Upgrade Laboratory Space Support Systems (ANL)	0	0	3,080	3,250	6,330

Project No.	Project Title	Total Prior Year Obligations	FY 1992 Appropriated	FY 1993 Request	Unappropriated Balance	TEC
93-E-310	Upgrade of Site Mechanical Utilities, Phase II Sewer Monitoring (LBL)	0	0	800	6,300	7,100
92-E-329	Electrical Substation Upgrade (ANL)	0	500	4,470	0	4,970
92-E-328	Technical and Administrative Services Facility Ames	0 a/	1,500	1,557	0	6,040
92-E-324	Safety Compliance Modifications, 326 Bldg. (PNL)	0	1,700	6,000	700	8,400
92-E-323	Upgrade Steam Distribution System - West End (ORNL)	0	1,080	5,607	2,313	9,000
92-E-322	East Canyon Electrical Safety Project (LBL)	0	377	1,507	2,016	3,900
92-E-321	Fire Safety Improvements (ANL)	0	603	1,117	0	1,720
92-E-312	Roof Replacements - Phase I	0	2,000	500	0	2,500
92-E-309	Sanitary Systems Modification - Phase I (BNL)	0	1,238	2,762	0	4,000
91-E-323	Building 90 Seismic Rehabilitation (LBL)	3,678	2,700	422	0	6,800
90-R-112	Measurements and Controls Support Facility (ORNL)	3,966	0	464	300	4,730
88-R-806	Environmental Health and Safety Project (LBL)	9,163	500	1,500	2,000	13,163
Subtotal Multiprogram Energy Laboratories - General Purpose Facilities Construction		\$16,807	\$12,198	\$56,700	\$58,955	\$147,643

a/ \$2,982,600 provided by Congress in Basic Energy Sciences program to initiate construction of this facility. These funds are part of the current cost estimate.

<u>Project No.</u>	<u>Project Title</u>	<u>Total Prior Year Obligations</u>	<u>FY 1992 Appropriated</u>	<u>FY 1993 Request</u>	<u>Unappropriated Balance</u>	<u>TEC</u>
<b><u>Multiprogram Energy Laboratories - Tiger Team Remediations</u></b>						
93-E-324	Hazardous Materials Safeguards, Phase I (LBL)	0	0	1,500	3,600	5,100
93-E-323	Fire and Safety Systems Upgrade, Phase I (LBL)	0	0	1,500	3,100	4,600
93-E-320	Fire and Safety Improvements, Phase II (ANL)	0	0	1,870	3,480	5,350
93-E-317	Life Safe Code Compliance (PNL)	0	0	1,000	1,300	2,300
93-E-315	Roof Replacement, Phase I (BNL)	0	0	1,130	2,000	3,130
<b>Subtotal, Multiprogram Energy Laboratories - Tiger Team Remediation Construction</b>		<b>\$0</b>	<b>\$0</b>	<b>\$7,000</b>	<b>\$13,480</b>	<b>\$20,480</b>
<b>Total Multiprogram Energy Laboratories - Facilities Support Construction</b>		<b>\$16,807</b>	<b>\$12,198</b>	<b>\$63,700</b>	<b>\$72,435</b>	<b>\$168,123</b>

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-336 HVAC Controls & Mechanical Systems Upgrade - Phase I  
 Pacific Northwest Laboratory  
 Richland, Washington

Project TEC: \$ 3,000  
 Start Date: FY 1993  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated a/</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$1,000	\$1,000	\$ 500
1994	2,000	2,000	1,500
1995	0	0	1,000

3. Narrative:

- (a) This project will provide for the renovation of the Heating, Ventilation and Air Conditioning Controls and Mechanical Systems in ER facilities in the 300 area to ensure safe facility operations.
- (b) The restoration of the mechanical systems will ensure that PNL multiprogram laboratory facilities can effectively support assigned activities. Various portions of the renovation work are intended to ensure environmental control of the facilities and ensure the safety of the lab personnel.
- (c) \$1,000,000 is requested in FY 1993 funding for design and to begin construction.

4. Total Project Funding (BA):

	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 1,000	\$ 2,000
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-333 Applied Science Center - Phase I  
 Brookhaven National Laboratory  
 Upton, New York

Project TEC: \$ 3,500  
 Start Date: FY 1993  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated a/</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 500	\$ 500	\$ 200
1994	3,000	3,000	1,830
1995	0	0	1,470

3. Narrative:

- (a) The proposed addition to the Department of Applied Science (DAS) building will provide approximately 12,000 sq. ft. of laboratory, office and support space.
- (b) The addition will be a two-story structure with an underground passageway. The first floor will be devoted principally to laboratory space with some space for offices, darkroom and bathrooms. The second floor will principally be office space with some space dedicated for a library, lunch room, etc.
- (c) \$1,180,000 is requested in FY 1993 funding to initiate project design and related activities.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 500	\$ 3,000
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

a/ Outyear amounts reflect funding levels higher than amounts contained in the OBM passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-332 Materials Handling Center  
 Brookhaven National Laboratory  
 Upton, New York

Project TEC: \$ 3,270  
 Start Date: FY 1993  
 Completion Date: FY 1994

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$3,270	\$3,270	\$1,670
1994	0	0	1,600

3. Narrative:

- (a) This project supports construction of a building to centralize the functions of Brookhaven's Laboratory Supply and Material Division. The functions are currently housed in four 40 year old buildings and four trailers.
- (b) Construction will consolidate stock items, chemicals, shipping, receiving and certain bulk storage into one model facility. This will be BNL's first effort to begin consolidation and relocation of its warehousing stockroom facilities into an efficient cost effective operation.
- (c) \$3,270,000 in funding is requested in FY 1993.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 3,270	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-329 Roofing Improvements  
 Oak Ridge National Laboratory  
 Oak Ridge, Tennessee

Project TEC: \$ 15,000  
 Start Date: FY 1993  
 Completion Date: FY 1996

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated a/</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$4,024	\$4,024	\$ 600
1994	6,000	6,000	5,600
1995	4,976	4,976	4,800
1996	0	0	4,000

3. Narrative:

- (a) This project supports replacement of deteriorated roofing on buildings and facilities throughout ORNL. It will replace roofs that are in the worst condition housing the most important facilities.
- (b) The purpose of this project is to replace deteriorated roofing on buildings and facilities at ORNL. Seventy percent of the roofs have been in place for more than 20 years. Because of age and deterioration, many of the roofs have developed leaks and require extensive maintenance. This project is needed before leakage problems reach the point that they affect equipment, records and research activities as well as the health and safety of personnel working in the facilities.
- (c) \$4,024,000 is requested to perform design and begin replacement of the most critical roofs.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 4,024	\$ 10,976
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-328 Central Research and Support Building  
 Oak Ridge National Laboratory  
 Oak Ridge, Tennessee

Project TEC: \$ 12,400  
 Start Date: FY 1993  
 Completion Date: FY 1996

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated <sup>a/</sup></u>	<u>Obligations</u>	<u>Costs</u>
1993	\$4,400	\$4,400	\$1,100
1994	5,000	5,000	4,000
1995	3,000	3,000	4,200
1996	0	0	3,100

3. Narrative:

- (a) This project will construct a new multistory office building as a replacement for a similar amount of obsolete temporary space. It will house a broad spectrum of research and support staff. In addition, the building will contain conference, training, storage, work rooms and reception areas. The project will also provide support for the costs of demolishing obsolete temporary buildings.
- (b) A large portion of the office space at ORNL is deteriorated, overcrowded, and in some cases doesn't comply with current OSHA standards. The project is required to provide adequate replacement space for approximately 250 people housed in inadequate facilities and supports an important first step in bringing ORNL into full compliance with all health and safety standards.
- (c) \$4,400,000 is requested in FY 1993 funding to initiate the design/build construction contract and related activities.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 4,400	\$ 8,000
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

<sup>a/</sup> Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-327 Safety and Support Services Facility  
 Lawrence Berkeley Laboratory  
 Berkeley, California

Project TEC: \$ 9,900  
 Start Date: FY 1993  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated a/</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$2,980	\$2,980	\$ 950
1994	4,470	4,470	2,900
1995	2,450	2,450	4,450
1996	0	0	1,600

3. Narrative:

- (a) This project supports construction of a three story building which will serve as the Safety and Support Services Facility to replace substandard space currently in use.
- (b) When construction of the Safety and Support Services Facility is complete, Central Stores and other Material Management Operations will be combined in the new building in close proximity to other allied administration operations including Purchasing, Business Services, Receiving, Shipping and Transportation. Removal of older temporary buildings and trailers will significantly enhance personnel safety and eliminate costly maintenance of substandard facilities.
- (c) \$3,800,000 is requested in FY 1993 funding to complete design and initiate construction.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 2,980	\$ 6,920
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

a/ Outyear amounts reflect levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-326 Laboratory Addition - Building 205  
 Argonne National Laboratory  
 Argonne, Illinois

Project TEC: \$ 5,750  
 Start Date: FY 1993  
 Completion Date: FY 1996

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated <sup>a/</sup></u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 620	\$ 620	\$ 360
1994	2,770	2,770	1,000
1995	2,360	2,360	3,360
1996	0	0	1,030

3. Narrative:

- (a) This project supports a 21,880 sq. ft. laboratory and office building addition, east of "D" Wing of Building 205. It is designed for a 25 year life and includes support such as roadways, loading dock and landscaping.
- (b) Argonne's Analytical Chemistry Laboratory (ACL) expanded its activities in several areas, notably environmental analysis. This expansion has included the addition of 15 FTEs who could not be adequately housed. In addition to housing the additional staff, the building will allow consolidation of ACL staff currently located at various sites across the laboratory.
- (c) \$620,000 is requested in FY 1993 to initiate engineering and design.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 620	\$ 5,130
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

<sup>a/</sup> Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY  
 Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-325 Potable Water System Upgrade - Phase I  
 Brookhaven National Laboratory  
 Upton, New York

Project TEC: \$ 5,250  
 Start Date: FY 1993  
 Completion Date: FY 1994

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$3,500	\$3,500	\$ 875
1994	1,750	1,750	2,375
1995	0	0	2,000

3. Narrative:

- (a) This project starts necessary upgrades of the potable water system at Brookhaven National Laboratory. It supports the first of several phases of an overall planned program to rehabilitate and improve the water supply and insure that an adequate supply of good quality water is available beyond the year 2000.
- (b) The existing nine potable water wells date back to 1941. The three oldest wells have been decommissioned because of volatile organic contamination. Only one does not show signs of contamination. The remaining well is capable of producing only half of the water requirements for the laboratory. Steps must be taken to insure a safe, adequate supply of water into the future. Five carbon absorption filtration units will be installed on wells 4, 6, 7, 10 and 12. Four thousand feet of cast iron piping and 1,750 feet of transite pipe will be replaced.
- (c) \$3,500,000 is requested in FY 1993 to begin Phase I.

4. Total Project Funding (BA):

	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 3,500	\$ 1,750
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-316 Underground Power and Communication System Upgrade - Phase I  
 Brookhaven National Laboratory  
 Upton, New York

Project TEC: \$ 3,600  
 Start Date: FY 1993  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated g/</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$1,400	\$1,400	\$ 200
1994	2,200	2,200	2,200
1995	0	0	1,200

3. Narrative:

- (a) This project supports the first phase of replacement of old and deteriorating underground electrical cables. The activities include the addition of underground ductbanks, new cables, a new substation and retrofitting of switchgear power circuit breakers.
- (b) Numerous failures have occurred in existing underground cables resulting in extensive electric service interruptions affecting both programmatic and non-programmatic facilities. Cable failures occur on an average of 2 to 3 times per year; emergency repairs require 48 to 72 hours. The average life of the cables is 30-40 years and several cables are now 40 years old.
- (c) \$1,400,00 is requested in FY 1993 to initiate the project.

4. Total Project Funding (BA):

	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 1,400	\$ 2,200
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

g/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-314 Sitewide Conventional Substation Feeder Improvement Project TEC: \$ 2,220  
 Stanford Linear Accelerator Center Start Date: FY 1993  
 Stanford, California Completion Date: FY 1994

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$2,220	\$2,220	\$1,340
1994	0	0	880

3. Narrative:

- (a) This project will provide support to replace cables which run from the master substation to the linac's conventional substations and other related substations.
- (b) The current situation will result in a major failure of conventional feeders unless the feeder system is replaced; failure will result in unplanned operations shutdowns. The project will improve reliability and bring the feeders into code compliance.
- (c) \$2,220,000 is requested in FY 1993 to support the entire project.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 2,220	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-313 Electrical System Upgrade - Phase II  
 Argonne National Laboratory  
 Argonne, Illinois

Project TEC: \$ 5,100  
 Start Date: FY 1993  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$3,000	\$3,000	\$ 750
1994	1,500	1,500	1,700
1995	600	600	1,375
1996	0	0	1,275

3. Narrative:

- (a) The project supports the upgrade of the main electrical distribution system and major components in the 200 area.
- (b) Due to the age of the electrical system, malfunctions have occurred. As maintenance of the switches is becoming increasingly difficult due to a scarcity of spare parts, a complete replacement is recommended to ensure safe, reliable and continuous operation of ongoing research. The new system will employ state of the art technology.
- (c) \$3,000,000 is requested in FY 1993 to initiate replacement.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 3,000	\$ 2,100
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-311 Upgrade Laboratory Space Support Systems  
 Argonne National Laboratory  
 Argonne, Illinois

Project TEC: \$ 6,330  
 Start Date: FY 1993  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$3,080	\$3,080	\$ 770
1994	2,220	2,220	2,385
1995	1,030	1,030	1,600
1996	0	0	1,575

3. Narrative:

- (a) This project supports upgrade of laboratory space support systems that are no longer adequate, reliable, efficient or in compliance with health and safety standards.
- (b) The systems requiring replacement (air compressor systems, emergency generators, and electric switchgear) are generally 30 to 40 years old and have many moving parts that have nearly worn out and need frequent replacement. Most replacements are difficult to obtain.
- (c) \$3,080,000 in FY 1993 funds are requested to initiate this project.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 3,080	\$ 3,250
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-310 Upgrade of Site Mechanical Utilities, Phase II  
 Sewer Monitoring  
 Lawrence Berkeley Laboratory  
 Berkeley, California

Project TEC: \$ 7,100  
 Start Date: FY 1993  
 Completion Date: FY 1996

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated a/</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 800	\$ 800	\$ 200
1994	3,350	3,350	1,775
1995	2,950	2,950	3,075
1996	0	0	2,050

3. Narrative:

- (a) This project includes additions and modifications to the sewer system at LBL including:
  - 1) the East Canyon Utility Center;
  - 2) the East Canyon Sewer Modifications;
  - 3) East and West Canyon Sanitary Sewer Monitoring Facilities; and
  - 4) Miscellaneous Site Utilities.
- (b) The East Canyon Utility Center will provide cooling water and compressed air to the Building 74/83 area and compressed air to other building areas in East Canyon. The facility is needed in order to remove two aged and obsolete cooling towers, allow expanded cooling, provide a central cooling system and provide a central compressed air facility in the East Canyon.
- (c) The Sanitary Sewer modifications are needed to separate LBL sanitary waste from that of UC Berkeley and gather LBL sanitary waste into one outfall.
- (d) New waste monitoring facilities will be constructed at West Canyon and East Canyon sanitary sewer outfalls. The West Canyon Monitoring Station is substandard and upgrades are not feasible. The East Canyon monitoring system is also substandard, located outside LBL boundaries and remote from the new site. Both existing monitoring stations must be replaced and removed.
- (e) \$800,000 is requested in FY 1993 funds to support architect/engineer contract.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 800	\$ 6,300
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 92-E-329 Electrical Substation Upgrade  
 Argonne National Laboratory  
 Argonne, Illinois

Project TEC: \$ 4,970  
 Start Date: FY 1992  
 Completion Date: FY 1994

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$ 500	\$ 500	\$ 400
1993	4,470	4,470	3,200
1994	0	0	1,370

3. Narrative:

- (a) The project provides for the upgrade of the main electrical substation at Facility 549.
- (b) The existing electrical system at Facility 549 has the capacity to service existing programmatic experiments and utilities. The system's reliability is questionable. The present load conditions are such that any transformer failure would result in the remaining transformers assuming a proportionate load and going into fan cooling capacity for a prolonged period of time until transformer repairs (6 to 9 months) or transformer replacement (12 months or longer) could be made. During this period of time it might be necessary to cut back on scientific program loads.
- (c) \$4,470,000 is requested in FY 1993 funding to support construction cost.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 500	\$ 4,470	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY  
 Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 92-E-328 Technical and Administrative Services Facility  
 Ames Laboratory  
 Ames, Iowa

Project TEC: \$ 6,040  
 Start Date: FY 1991<sup>a/</sup>  
 Completion Date: FY 1993

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1991	\$ 0 <sup>a/</sup>	\$ 0 <sup>a/</sup>	\$ 0
1992	1,500	1,500	400
1993	1,557	1,557	1,800
1994	0	0	857

3. Narrative:

- (a) This project supports construction of a four-story building which will house the programmatic support activities and the central administrative offices of the Ames Laboratory.
- (b) The Occupational Medicine program at Ames is currently located in space that is inadequate for its mission. The administrative support personnel, who perform the functions of accounting, budgeting, procurement, property management, personnel, graphics and printing, and data systems are located in a building designed for research facilities. Usage of facilities by personnel other than researchers does not represent efficient use of research space. Presently, administrative computer facilities are located in a renovated vehicle garage built in 1950, which is remotely located from the organizational elements these facilities support. The scientific computer facilities are located in other laboratory areas and rented space. The movement of these facilities to the new structure will allow Ames Laboratory to satisfy both ADP environmental and ADP security requirements while becoming readily accessible to those primary users of the system which include top management personnel, administrative staff and operations and facilities organizational elements. Ames Laboratory management is currently located in offices rented from Iowa State University which are remotely located from the majority of other organizational elements of the Ames Laboratory, such as the offices of budget, personnel and accounting.
- (c) \$1,557,000 is requested in FY 1993 funding. Architectural/engineering efforts began in FY 1991, physical construction to begin 3rd quarter of FY 1992.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 1,500	\$ 1,557	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	25	0	0	0	0

<sup>a/</sup> \$2,982,600 provided by Congress in Basic Energy Sciences program to initiate construction of this facility. These funds are part of the current cost estimate.

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Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 92-E-324 Safety Compliance Modifications, 326 Building  
 Pacific Northwest Laboratory  
 Richland, Washington

Project TEC: \$ 8,400  
 Start Date: FY 1992  
 Completion Date: FY 1994

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$1,700	\$1,700	\$ 400
1993	6,000	6,000	3,054
1994	700	700	3,746
1995	0	0	1,200

3. Narrative:

- (a) The project will bring the 326 Building, which is an aged but strategically important laboratory, into compliance with National Fire Protection Association (NFPA) Requirements, National Electric Code Requirements, and State of Washington Requirements. Since its construction in 1952, the building has been in continuous use. Although the building is structurally sound, it does not meet today's building codes and standards of acceptability for health and safety.
- (b) The project will clearly define the egress pathways from the facility, provide fire resistant stairwells and exit corridors, extensively upgrade the building electrical system to comply with the National Electric code including replacement of most of the electrical distribution system, installation of a new motor control center, installation of backflow prevention on the fire main to meet State of Washington Requirements, installation of handicap facilities, installation of full wet-pipe sprinklers to comply with NFPA Requirements, and other modifications to meet code requirements.
- (c) \$6,500,000 is requested in FY 1993 to support construction.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 1,700	\$ 6,500	\$ 200
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	120	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 92-E-323 Upgrade Steam Distribution System - West End  
 Oak Ridge National Laboratory  
 Oak Ridge, Tennessee

Project TEC: \$ 9,000  
 Start Date: FY 1992  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$1,080	\$1,080	\$ 300
1993	5,607	5,607	3,000
1994	2,313	2,313	3,200
1995	0	0	2,500

3. Narrative:

- (a) This project is needed to replace deteriorated portions of the central steam distribution system at the Oak Ridge National Laboratory (ORNL), predominately in the western end of the plant. New isolation valves will be installed to improve efficiency, reliability, and maintainability.
- (b) This project will replace sections of the central steam and air supply systems, predominately in the west end of ORNL, that have been in service for as long as 30 years and are approaching the end of their useful life. The system contains twelve bellows-type expansion joints identical to those that have failed catastrophically in other areas at the laboratory. System failure in any of several areas could result in the interruption of experiments which have been ongoing for several years and could impact research and related activity involving multimillion dollar budgets.
- (c) \$5,607,000 is requested in FY 1993 to support construction.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 1,080	\$ 5,607	\$ 2,313
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	130	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 92-E-322 East Canyon Electrical Safety Project  
 Lawrence Berkeley Laboratory  
 Berkeley, California

Project TEC: \$ 3,900  
 Start Date: FY 1992  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated a/</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$ 377	\$ 377	\$ 100
1993	1,507	1,507	800
1994	2,016	2,016	2,000
1995	0	0	1,000

3. Narrative:

- (a) The project is the third of several rehabilitation elements that are part of a master plan to improve the reliability of the electrical distribution system of the entire laboratory. The project will utilize the new circuit breakers provided in FY 1987 by the improvements to the main substation. A new 12kV switching station and new 12kV distribution circuits to laboratory facilities in the East site area will be installed, as will a new 500 kVA substation with standby generation at the National Center for Electron Microscopy.
- (b) The existing 12kV power system has major deficiencies. There is no redundancy, so that a cable fault will cause extended power outage. There is no ground fault protection, which would result in a loss of power to the entire East Site. Since there is no redundancy, preventive maintenance operations can only be accomplished during scheduled shutdowns of the entire East Site. The power cable is reaching the end of its useful life (21 years of a 25 years maximum) and should be replaced. A new substation at the National Center for Electron Microscopy is required to provide an independent power supply system to this major research facility. Power outages adversely affect the operation of the electron microscopes, requiring long time periods for adjustment and re-calibration of these major scientific instruments.
- (c) \$1,507,000 is requested in FY 1993 to support construction.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 377	\$ 1,507	\$ 2,016
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 92-E-321 Fire Safety Improvements  
 Argonne National Laboratory  
 Argonne, Illinois

Project TEC: \$ 1,720  
 Start Date: FY 1992  
 Completion Date: FY 1994

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$ 603	\$ 603	\$ 546
1993	1,117	1,117	620
1994	0	0	554

3. Narrative:

- (a) This project will encompass fire protection system extensions, new installations, and replacements in 29 ANL-E buildings. The project can be grouped into three sub-projects which will include: extensions or new installations of wet-pipe sprinkler systems, replacement of existing fire alarm panel and detection devices, and extending the fire separation walls around a large computer room.
- (b) In the sprinkler system subproject, 9 buildings will have sprinkler systems extended to unprotected areas and 8 buildings will have new systems installed throughout. For the fire detection systems subproject, the systems in 20 buildings are 25 to 35 years old and have numerous shortcomings. Recent occupancy changes and existing wall deficiencies necessitate the upgrading of the separation walls around the computer room in the computer room wall modifications subproject.
- (c) \$1,117,000 is requested in FY 1993 to support construction.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 603	\$ 1,117	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 92-E-312 Roof Replacements - Phase I  
 Lawrence Berkeley Laboratory  
 Berkeley, California

Project TEC: \$ 2,500  
 Start Date: FY 1992  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$ 2,000	\$ 2,000	\$ 800
1993	500	500	1,300
1994	0	0	900

3. Narrative:

- (a) The project will replace over 143,000 sq ft. of high maintenance roofs in critical need of repair/replacement. The roofing system is a 3-ply modified bitumen membrane with mineral surface, which provides water resistance, elasticity for thermal expansion/contraction and vibration from mechanical sources, strengths and durability for foot traffic and ease of maintenance and repair. New roof insulation will be installed, which will decrease energy use and save an estimated \$66K/year in energy costs. Equipment on platforms will be braced to conform with the latest seismic codes.
- (b) The roofs which will be replaced are characterized by old age, deterioration, high maintenance and have long outlived their recommended service life of 20 years. The average age is 34 years old. These roofs are characterized by widespread leakage and are no longer cost effective to maintain. Replacement of these roofs will reduce associated maintenance cost by about 20 percent.
- (c) \$500,000 is requested in FY 1993.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 2,000	\$ 500	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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 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: 92-E-309 Sanitary Systems Modification - Phase I  
 Brookhaven National Laboratory  
 Upton, New York

Project TEC: \$ 4,000  
 Start Date: FY 1992  
 Completion Date: FY 1994

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$1,238	\$1,238	\$ 620
1993	2,762	2,762	1,700
1994	0	0	1,680

3. Narrative:

- (a) This project provides the first phase of implementing the rehabilitation projects which affect the ability of the existing system to properly collect and treat the sanitary wastes generated by the Brookhaven facility.
- (b) As a result of recent growth and the need to upgrade the various sanitary facilities to current day standards, improvements need to be made to the waste water treatment plant and the sewage collection system.
- (c) \$2,762,000 is requested in FY 1993.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 1,238	\$ 2,762	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 91-E-323 Building 90 Seismic Rehabilitation  
 Lawrence Berkeley Laboratory  
 Berkeley, California

Project TEC: \$ 6,800  
 Start Date: FY 1992  
 Completion Date: FY 1994

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1991	\$3,678	\$3,678	\$ 36
1992	2,700	2,700	3,000
1993	422	422	2,364
1994	0	0	1,400

3. Narrative:

- (a) Building 90 is a four-story structural steel office building which was designed to the 1955 Uniform Building Code which did not reflect the maximum design earthquake now anticipated on the nearby Hayward Fault. The structure is much too flexible and would experience extreme stresses and inelastic lateral deflections in the event of a major earthquake, rendering the building uninhabitable for a minimum period of three years, provided capital funding for replacement of the building were immediately available. The existing Building 90 would have to be demolished and replaced.
- (b) The proposed project will brace the building to withstand the maximum design earthquake on the Hayward Fault and eliminate stresses induced by long term differential settlement. The use of the strengthened building will not change. No new floor space will be added.
- (c) \$422,000 is requested in FY 1993 to complete the project.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 3,678	\$ 2,700	\$ 422	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	100	0	0	0

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories -- Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

1. Project title and location: 90-R-112 Measurements and Controls Support Facility  
 Oak Ridge National Laboratory (ORNL)  
 Oak Ridge, Tennessee

Project TEC: \$ 4,730  
 Start Date: FY 1991  
 Completion Date: FY 1994

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Obligations</u>	<u>Costs</u>
1990	\$ 884	\$ 884	\$ 0
1991	3,082	3,082	5
1992	0	300 <u>a/</u>	2,609
1993	464	464	1,820
1994	0	0	296

3. Narrative:

- (a) This project will construct a two-story building providing approximately 20,000 square feet in the Instruments and Controls complex area.
- (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) \$464,000 is requested in FY 1993 funding to complete support.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 884	\$ 3,082	\$ 0 <u>a/</u>	\$ 464	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	220	0	0	0	0

a/ \$300,000 reprogrammed from completed prior year project (87-R-752).

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 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 General Purpose Facilities

IV. B. Plant Funded Construction Project

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

Project TEC: \$ 13,163  
 Start Date: FY 1988  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated a/</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 850	\$ 850	\$ 59
1989	2,429	2,429	1,090
1990	4,310	4,310	172
1991	1,574	1,574	891
1992	500	500	4,500
1993	1,500	1,500	4,000
1994	2,000	2,000	1,500
1995	0	0	951

3. Narrative:

- (a) This project includes nine subprojects necessary to improve and protect the environment and the safety and health of LBL employees and the general public. The changes will correct the more urgent and serious deficiencies which pose the greatest threat of pollution, contamination, accident or disruption of program activities.
- (b) Equipment, controls and facilities are old, deteriorated and in need of upgrading or replacement in order to comply with applicable standards.
- (c) \$1,500,000 is requested in FY 1993.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 7,589	\$ 1,574	\$ 500	\$ 1,500	\$ 2,000
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Tiger Team Remediations

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-324 Hazardous Materials Safeguards, Phase I  
 Lawrence Berkeley Laboratory  
 Berkeley, California

Project TEC: \$ 5,100  
 Start Date: FY 1993  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated a/</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$1,500	\$1,500	\$ 500
1994	3,600	3,600	2,300
1995	0	0	2,300

3. Narrative:

- (a) This project will upgrade Building 70 to add safety, health and environmental protection safeguards to meet or exceed current standards for public health and safety.
- (b) The existing Building 70 is an aged laboratory facility used for materials sciences and semi-conductor research. These operations employ a wide variety of chemicals which are highly flammable and/or toxic. If this project is not supported, research operations must be restricted, resulting in curtailing or eliminating fields of research at LBL.
- (c) \$1,500,000 in funding is requested in FY 1993 to initiate construction.

4. Total Project Funding (BA):

	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 1,500	\$ 3,600
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

DEPARTMENT OF ENERGY  
 FY 1993 CONGRESSIONAL BUDGET REQUEST  
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 ENERGY SUPPLY, RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Tiger Team Remediations

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-323 Fire and Safety Systems Upgrade, Phase I  
 Lawrence Berkeley Laboratory  
 Berkeley, California

Project TEC: \$ 4,600  
 Start Date: FY 1993  
 Completion Date: FY 1996

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated <sup>a/</sup></u>	<u>Obligations</u>	<u>Costs</u>
1993	\$1,500	\$1,500	\$ 500
1994	2,000	2,000	1,200
1995	1,100	1,100	1,600
1996	0	0	1,300

3. Narrative:

- (a) This project is the first of several which will bring LBL facilities into compliance with building, fire and life safety codes.
- (b) A majority of facilities at LBL were constructed from the 1940s to the mid 1960s. The facilities provided national scientific leadership during a historically significant time. Since this period, major changes have occurred in building, fire and life safety codes. This project will support modifications required to meet new codes and correct noncompliance conditions.
- (c) \$1,500,000 in funding is requested in FY 1993 to initiate this project.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 1,500	\$ 3,100
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

<sup>a/</sup> Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Tiger Team Remediations

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-320 Fire and Safety Improvements - Phase II  
 Argonne National Laboratory  
 Argonne, Illinois

Project TEC: \$ 5,350  
 Start Date: FY 1993  
 Completion Date: FY 1996

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated a/</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$1,870	\$1,870	\$ 470
1994	2,000	2,000	1,700
1995	1,480	1,480	1,870
1996	0	0	1,310

3. Narrative:

(a) This project supports Phase II of required fire safety improvements at ANL.

(b) Phase II will complete upgrading of existing fire alarm and suppression systems and expand fire suppression systems to cover areas requiring protection.

(c) \$1,870,000 in funding is requested in FY 1993 to initiate this project.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 1,870	\$ 3,480
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Tiger Team Remediations

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-317 Life Safety Code Compliance  
 Pacific Northwest Laboratory  
 Richland, Washington

Project TEC: \$ 2,300  
 Start Date: FY 1993  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated <sup>a/</sup></u>	<u>Obligations</u>	<u>Costs</u>
1993	\$1,000	\$1,000	\$ 500
1994	1,300	1,300	1,050
1995	0	0	750

3. Narrative:

- (a) This project supports upgrades to selected 300 area PNL multiprogram facilities. These upgrades will correct deficiencies in fire and life safety codes.
- (b) The project will ensure continuity of operations in vital multiprogram laboratories at PNL. The current conditions of the buildings have raised many concerns about their adequacy for continuing operations. PNL's research missions can be continued by completing the work proposed in this project.
- (c) \$1,000,000 in funding is requested in FY 1993 to initiate this project.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 1,000	\$ 1,300
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

<sup>a/</sup> Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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 ENERGY SUPPLY, RESEARCH AND DEVELOPMENT  
 (dollars in thousands)

KEY ACTIVITY CONSTRUCTION PROJECT SUMMARY

Multiprogram Energy Laboratories - Facilities Support  
 Tiger Team Remediations

IV. B. Plant Funded Construction Project

1. Project title and location: 93-E-315 Roof Replacement - Phase I  
 Brookhaven National Laboratory  
 Upton, New York

Project TEC: \$ 3,130  
 Start Date: FY 1993  
 Completion Date: FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriated a/</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$1,130	\$1,130	\$ 850
1994	2,000	2,000	1,280
1995	0	0	1,000

3. Narrative:

- (a) This project supports roof replacement on 13 buildings at BNL. Approximately 385,000 sq. ft. of re-roofing will be accomplished during this phase.
- (b) Roof surveys conducted in 1989 have indicated that approximately 718,000 sq. ft. of roofing on 46 buildings will have to be replaced. This project represents Phase I.
- (c) \$1,130,000 is requested in FY 1993 to initiate this project.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 1,130	\$ 2,000
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

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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: HVAC Controls & Mechanical Systems Upgrade - Phase I Pacific Northwest Laboratory Richland, Washington

2. Project No.: 93-E-336

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3a. Date A-E work initiated, (Title I design start scheduled): 1st Qtr FY 1993

3b. A-E work (Title I & II) duration: 10 months

4a. Date physical construction starts: 1st Qtr FY 1994

4b. Date construction ends: 2nd Qtr FY 1995

5. Previous construction cost estimate: None

6. Current construction cost estimate: \$ 3,000  
 TECC: \$ 3,000  
 TPC: \$ 3,050  
 Date: January 1992

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<u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$ 1,000	\$ 1,000	\$ 500
	1994	2,000	2,000	1,500
	1995	0	0	1,000

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

## PROJECT DATA SHEETS

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1. Title and Location of Project:	HVAC Controls & Mechanical Systems Upgrade - Phase I Pacific Northwest Laboratory Richland, Washington	2. Project No.: 93-E-336
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### 8. Brief Physical Description of Project

This project will provide for the renovation of the Heating, Ventilation and Air Conditioning Controls plus Mechanical Systems in PNL Multiprogram Laboratory facilities in the 300 Area to ensure safe facility operation.

The major work planned consists of the following items:

- o Replacement of existing aging supply and exhaust fans.
- o Replacement of building sump pumps and sump system renovation.
- o Replacement of deteriorated laboratory vacuum pumps and providing the required reliability of laboratory air sampling systems by adding second vacuum pumps.
- o Renovate the HVAC system for the animal facility including improved humidity and temperature control, redundancy of both supply and exhaust air fans, and improved delivery of air supply to the individual rooms.
- o Breathing air compressors replacement due to heavy wear and obsolescence.
- o Replacement of an existing water-wheel type evaporative cooling system with a refrigerated air conditioned system.
- o Replacement of heating and cooling coils and HVAC system controls.

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

The purpose of this project is to renovate the mechanical systems of existing multiprogram facilities to ensure that PNL multiprogram laboratory facilities can and will continue to effectively support the activities assigned to them. The various elements of renovation work are intended to provide proper environmental control of the facilities and to ensure the safety of laboratory personnel as well as the outside environment.

These facilities are typically 20 to 40 years old, and many of the original systems are still in use today. The HVAC systems are in many cases undersized for today's requirements, are in deteriorated condition and do not meet current or projected requirements.

PROJECT DATA SHEETS

1. Title and Location of Project: HVAC Controls & Mechanical Systems Upgrade - Phase I  
Pacific Northwest Laboratory  
Richland, Washington

2. Project No.: 93-E-336

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

Program needs have become more and more stringent, especially in the areas of air quality, and temperature and humidity control. Also, the growing use of carcinogenic, hazardous, and radioactive materials in research activities necessitates stronger controls to assure the safety of laboratory personnel. In some cases, there is inadequate capacity to support minimum requirements of the assigned mission.

The current condition of these buildings has raised many concerns about their adequacy to continuing operations. The PNL research missions can be assured continuation by completing the work proposed in this project. This project also corrects Tiger Team priority 3 deficiencies addressed in TS.3-2.

10. Details of Cost Estimate a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. (1) Engineering, design and inspection @ approximately 43% of construction costs, item b.....		\$ 660
(2) Construction management at approximately 12% of construction costs, Item b....		190
b. Construction costs.....		1,550
(1) Buildings.....	\$1,550	
Subtotal.....		<u>2,400</u>
c. Contingency at approximately 15% of above costs.....		<u>600</u>
Total estimated construction cost (TECC).....		<u>\$3,000<sup>b/</sup></u>

a/ The above estimates are based on completed conceptual design.

b/ Material and labor rates have been escalated to 1991 dollars using the conversion method and index found in the Department of Energy Material and Labor Escalation Study for Richland Operations Office, FY 1991, Appendix 1, page 12.

PROJECT DATA SHEETS

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1. Title and Location of Project:	HVAC Controls & Mechanical Systems Upgrade - Phase I Pacific Northwest Laboratory Richland, Washington	2. Project No.: 93-E-336
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11. Method of Performance

Design and inspection will be performed by the on-site architect engineer. Construction and procurement will be accomplished by the Hanford CPAF constructor because the work to be done will have to be coordinated with on-going operations in some of the buildings.

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

a. Total project funding

(1) Total facility funding

(a) Conceptual design was completed in FY 1991 at a total cost of \$50,000.

b. Total related funding requirements

None.

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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: Applied Science Center - Phase I<br>Brookhaven National Laboratory<br>Upton, New York | 2. Project No. 93-E-333   |
| 3a. A-E initiated, (Title I design start scheduled): 2nd Qtr FY 1993  | 5. Previous construction cost estimate: None  |
| 3b. A-E work (Title I & II) duration: 6 months  | 6. Current construction cost estimate: \$3,500<br>TECC: \$3,500<br>TPC: \$3,500<br>Date: January 1992 |
| 4a. Date physical construction starts: 2nd Qtr FY 1994  | 6. Current construction cost estimate: \$3,500<br>TECC: \$3,500<br>TPC: \$3,500<br>Date: January 1992 |
| 4b. Date construction ends: 2nd Qtr FY 1995   | 6. Current construction cost estimate: \$3,500<br>TECC: \$3,500<br>TPC: \$3,500<br>Date: January 1992 |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$ 500	\$ 500	\$ 200
	1994	3,000	3,000	1,830
	1995	0	0	1,470

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

PROJECT DATA SHEETS

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1. Title and location of project: Applied Science Center - Phase I Brookhaven National Laboratory Upton, New York	2. Project No. 93-E-333
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8. Brief Physical Description of Project

The proposed addition to the Department of Applied Science (DAS) Building 815 will provide approximately 12,000 sq. ft. of laboratory, office and support space.

The proposed expansion will be at the north side of Building 815. It will be a two-story structure with an underground passageway leading to a large existing basement. To better utilize the existing basement, a passenger/freight elevator will be included. The basement is currently served by only stairs and an outside areaway. The addition is structural steel framing with open web joists, concrete block and brick exterior to match existing and gypsum wallboard on metal stud and concrete block interior partitions. An insulated metal roof deck with built-up roofing will be used. Insulated aluminum windows, for energy conservation, will be provided for operational and functional requirements.

The first floor plan layout is devoted principally to laboratory space but with some space for offices, darkroom and toilets. The second floor is principally office space with some space for library, lunch room, file/xerox rooms and toilets. Two offices in the existing structure will be modified for conference space.

The addition will be designed to DOE Order 6430.1, "General Design Criteria" and will meet or exceed the latest DOE Standards for Energy Conservation. The fire protection system will be hydraulically designed, in accordance with NFPA 13. DOE Standards for accessibility for the handicapped will be incorporated into the design of the addition.

Building 815, first occupied in 1962, is the only office-laboratory building predominantly occupied by Department of Applied Science (DAS). It was built as the first phase of integrating the Department's operations. The 1989 Site Development Plan refers to it as the center of the DAS campus at BNL.

As presently structured, DAS does not occupy anything resembling a campus. The eight Divisions, which comprise the Department, are housed in some twelve major buildings and three user facilities with DAS Administration remote from any of its staff. These buildings, in contrast to Building 815, are older (mostly World War II vintage Army buildings), more crowded, and have high maintenance costs due to their age and construction.

DAS, in concert with the Director's Office, has embarked on a five-year program both to consolidate and upgrade the Department's space. For instance, General Plant Project (GPP) monies have and will be used to upgrade Building 801, one of the older permanent structures at BNL. Building 527 is now undergoing a renovation with occupancy planned by late December. After the various stages of this plan are enacted, DAS will be housed in only five buildings, with the three facilities remaining as they are now. A key component of this plan is this addition to Building 815.

PROJECT DATA SHEETS

1. Title and location of project: Applied Science Center - Phase I  
Brookhaven National Laboratory  
Upton, New York

2. Project No. 93-E-333

9. Purpose, Justification of Need and Scope of Project

Of the eight Divisions which comprise DAS, only Chemical Sciences, is fully housed in 815 now. Parts of two other Divisions, Applied Physics and Environmental Chemistry, fill the rest of the structure.

Another DAS structure, Building 318, which was constructed during WWII, now houses parts of two other DAS Divisions: Oceanographic & Atmospheric Sciences (O&AS); Biosystems & Process Sciences (B&PS); and a minor part of Applied Physics. All these Divisions have expanding programs and Building 318 has no expansion space available. Expansion needs are primarily related to receipt of funds to participate in DOE's Global Climate Change programs.

The proposed addition to Building 815 will house the O&AS Division, providing them with laboratories, offices and some growth potential to consolidate the staff. The site map shown in the Conceptual Design Report graphically demonstrates the need for consolidation within all of the Department's programs. At the same time, this will relieve some pressure on the B&PS Division which will remain in Building 318 for the present. It should also be possible to relocate the Applied Physics space to Building 815.

In summary, the need to replace failing WWII wood structures with modern energy efficient buildings and consolidate the DAS functions is very important to the success of DAS programs and the Laboratory. The fragmentation of approximately 240 in-house DAS staff (supplemented at peak periods by research collaborating students and consultants) reduces the efficiency, management and opportunities for the exchange of information.

10. Details of Cost Estimate a/

	<u>Item Cost</u>	<u>Total Cost</u>
a. (1) Engineering, design, inspection and administration at approximately 14% of construction costs, Item b.....		\$ 375
(2) Construction management at 2% of construction costs, Item b.....		53
b. Construction costs.....		2,672
(1) Site Work.....	\$ 167	
(2) Architectural/Structural.....	1,700	
(3) Mechanical Services.....	460	
(4) Electrical Services.....	345	
Subtotal .....		<u>\$3,100</u>
c. Contingency at approximately 13% of the above cost.....		400
Total estimated construction costs (TECC).....		<u>\$3,500</u> b/

a/ This estimate is based on Conceptual Design Report dated December 1990.

b/ Escalation rates used were taken from DOE Departmental Price Change Index - FY 92 Guidance, August 1990 update; 3.6% - FY 1991, 4.5% - FY 1992, 5.1% - FY 1993, 5.6% - FY 1994 and 5.7% - FY 1995.

PROJECT DATA SHEETS

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1. Title and location of project: Applied Science Center - Phase I  
Brookhaven National Laboratory  
Upton, New York
2. Project No. 93-E-333
- 

11. Method of Performance

Design and inspection will be on the basis of a negotiated architect-engineer contract. Construction and procurement will be accomplished by a competitively obtained lump sum contract.

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  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
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: Materiels Handling Center<br>Brookhaven National Laboratory<br>Upton, New York | 2. Project No. 93-E-332   |
| 3a. Date A-E initiated (Title I design start scheduled): 1st Qtr FY 1993   | 5. Previous construction cost estimate: None  |
| 3b. A-E work (Title I & II) duration: 6 months   | 6. Current construction cost estimate: \$3,270<br>TECC: \$3,270<br>TPC: \$3,270<br>Date: January 1992 |
| 4a. Date physical construction starts: 3rd Qtr FY 1993   | 6. Current construction cost estimate: \$3,270<br>TECC: \$3,270<br>TPC: \$3,270<br>Date: January 1992 |
| 4b. Date construction ends: 4th Qtr FY 1994  | 6. Current construction cost estimate: \$3,270<br>TECC: \$3,270<br>TPC: \$3,270<br>Date: January 1992 |

7. <u>Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$3,270	\$3,270	\$1,670
	1994	0	0	1,600

PROJECT DATA SHEETS

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1. Title and Location of project: Materiels Handling Center  
Brookhaven National Laboratory  
Upton, New York

2. Project No. 93-E-332

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8. Brief Physical Description of Project

This proposal provides for the construction of a building having a gross area of 25,000 s.f. and an approximate volume of 500,000 cubic feet. About 22,400 s.f. will be functional space or a net to gross area of 90%. The building will centralize many of the functions of the Laboratory's Supply and Material Division. The functions are presently housed in 4 buildings, which are 40 year-old World War II temporary structures, and 4 trailers. The BNL Site Development Plan calls for this Supply and Material Division project to provide a new building complex which will require less space, and be designed to use modern warehousing technologies.

Site selection was examined for efficiency, safety and developmental costs. The land chosen is at the northeast corner of Rochester Street and Weaver Drive. Land will be cleared and top soil stripped, stored, and spread when construction is complete. All access drives, walks, ramps, curbs, service yards, parking fields, and lighting will be included. Parking for 26 staff and 7 visitor vehicles will be provided, among which provisions for the handicapped will be incorporated. Trenching and connecting to the existing power, sewer, and water systems will be included.

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, except where they act as an energy conserving feature. All sash shall be insulated, thermal break non-ferrous type. The building's 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. Partitions will be sound attenuated steel stud design with appropriate gypsum wallboard finish. Generally, ceilings in finished areas will be suspended acoustical grid type. Finished areas will receive resilient tile flooring and hardened concrete floors will be used elsewhere.

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

PROJECT DATA SHEETS

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1. Title and Location of project: Materiels Handling Center  
Brookhaven National Laboratory  
Upton, New York

2. Project No. 93-E-332

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8. Brief Physical Description of Project (Continued)

The office and warehouse areas will be air conditioned. Exhaust and fresh air ventilation systems will be included where needed, so that the entire building is limited to a 5 cfm fresh air supply per person. All environmental systems will be designed with current state-of-the-art techniques to minimize energy consumption, including days of opportunity fresh air system, and automatic day-night temperature setback and equipment shut-off control features. Water and electric meters will be included. The entire facility will be protected by a sprinkler system and/or other appropriate fire protection systems. The sprinkler system will be designed to comply with DOE Order 5480, NFPA 13 and Factory Mutual Standards.

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

<u>Space</u>	<u>Area</u> (s. f.)
Offices	920
Warehousing space	17,200
Staging areas	1,800
Work areas	2,480
Sub-Total functional areas.....	22,400
Rest rooms, etc.	460
Corridors, stairs, lobby	800
Mechanical/electrical equipment	400
Exterior walls	940
Sub-Total non-functional areas.....	2,600
TOTAL.....	25,000 s.f.

PROJECT DATA SHEETS

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1. Title and Location of project: Materiels Handling Center  
Brookhaven National Laboratory  
Upton, New York

2. Project No. 93-E-332

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9. Purpose, Justification of Need and Scope of Project

This proposed facility will allow the removal of four buildings totalling 32,200 square feet and the mothballing of one 9,900 square foot building.

The facility will have a total area of about 25,000 square feet and will use state-of-the-art materials handling and storing equipment. In addition to greatly reduced space requirements, staffing will be able to be reduced by seven persons. Energy requirements will be substantially less than for the old wood frame army buildings being replaced.

Current building use is not efficient due to design constraints, size, and locations. A Master Plan prepared by Thompkins Associates, Inc. in 1983 demonstrated that unifying the warehouse functions would provide an effective payback. This would be accomplished by reducing required personnel and implementing more effective stocking devices. Additionally, service to Laboratory users would be enhanced.

This proposal provides for the construction of a new building to consolidate all stores issue stock items, chemicals, shipping, receiving, and certain bulk storage into one modern facility. This will be the Laboratory's first effort to begin the consolidation and relocation of its warehousing stockroom facilities into an efficient cost effective operation. The site selected for this proposed warehouse allows for future expansion for further consolidation of bulk storage facilities. It is near the existing rail siding and required site utility systems.

The plan for consolidation is:

1. Construct the new facility.
2. Vacate Building 89 (Shipping and Receiving), Building 90 (Central Stockroom), Building 91 (Maintenance Stockroom), Building 100 (Bulk Warehouse), and Building 475 (Chemical Storage).
3. Demolish Buildings 89, 90, 91 and 457; all wood frame army buildings.
4. Move the contents of Buildings 178 and 424 (AGS bulk storage) into Building 100.
5. Demolish Building 178, a wood frame building originally built as an army lecture hall.
6. Mothball Building 424 at standby level for future use for a proposed educational project. This is a masonry block building erected as an army theatre.

PROJECT DATA SHEETS

1. Title and Location of project: Materials Handling Center  
Brookhaven National Laboratory  
Upton, New York

2. Project No. 93-E-332

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

Supply and Material Building functions which will be relocated in the new facility are:

<u>Building No.</u>	<u>Description</u>	<u>Area</u> (s.f.)
86	Chemical Storage	660
89	Shipping and Receiving	9,300
90	Central Stockroom	9,500
91	Maintenance Stockroom	9,400
100	Bulk Warehouse	13,600
158	Chemical Storage	240
482	Chemical Storage	<u>1,000</u>
	Total Area	43,700 s.f.

The buildings which will be demolished are Buildings 89, 90, 91 and 176 (4,000 sq. ft.), for a total of 32,200 sq. ft. Building 424 (9,900 sq. ft.) will be placed in standby status. Thus, the net reduction in laboratory building area will be 8,800 sq. ft. An additional 9,900 sq. ft. will be mothballed, for a total reduction in occupied space of 18,700 sq. ft.

Annual cost savings are estimated as follows:

a. Personnel Reduction

7 MY at \$38,500 = \$269,500

b. Energy Savings

Existing 43,700 s.f. at \$1.44/s.f. = \$62,928 (Bldgs. 89, 90, 91, 176, 424 and 482)  
New 25,000 s.f. at \$ .93/s.f. = 23,250  
Net Energy Savings \$39,678

c. Total Savings

Personnel \$269,500  
Energy 39,678  
\$309,178

PROJECT DATA SHEETS

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1. Title and Location of project: Materiels Handling Center  
Brookhaven National Laboratory  
Upton, New York

2. Project No. 93-E-332

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

The above costs are all in FY 1991 dollars. Energy savings are for the demolished and the mothballed buildings. In addition, there will be savings in maintenance and operating costs. Major maintenance and rehabilitation was performed on all the warehouse area buildings during the early 1960s. Since then, minimum maintenance has been done due to lack of funds and staff. The existing buildings will become severely deteriorated, possibly unsafe, if extensive repair work is not performed within the next decade. Maintenance cost surveys indicate that about \$5,000 per year is spent on the buildings proposed for replacement. Brookhaven National Laboratory's goal is to consolidate and modernize all warehousing facilities so that they are safe and efficient. These facilities will provide the largest research dollars' worth of space and effort for the amount expended to stock and dispense the required inventory.

Due to the nature of the research and experimental activities at BNL, there is a need to receive, warehouse and distribute large volumes of a wide range of solvents, degreasers, and oils which are toxic and hazardous to the environment. These materials are currently stored in several different warehouse buildings that are not designed to prevent intrusion into the aquifer if there is an accident.

The largest and most important groundwater resource in New York State is the aquifer which underlies Long Island. It represents the only source of drinking water for over three million people. The aquifer was one of the first in the country designated as a sole source aquifer by the U. S. EPA under provisions of the Federal Safe Drinking Water Act.

Long Island's groundwater is particularly sensitive to contamination. The porous nature of the geologic deposits which make up the Island allow pollutants generated at the land surface to travel easily through the soil into the aquifer system. Water movement in aquifer systems is typically very slow and any contamination tends to remain for many years. Once contaminants have entered the groundwater, cleanup may not be technically or economically feasible and treatments could be required before the water can be used.

The Suffolk County Department of Health Services has strict requirements for the storage and handling of toxic and hazardous materials under Article 12 of their Sanitary Code. The availability of conforming storage in the present warehouse facilities is severely limited. One of the objectives of the proposed materials handling facility is to provide additional capacity to store these materials in a manner which would prevent their release to the sensitive environment and would be in compliance with all applicable federal, state and local regulations.

PROJECT DATA SHEETS

1. Title and Location of project: Materiel's Handling Center  
Brookhaven National Laboratory  
Upton, New York

2. Project No. 93-E-332

10. Details of Cost Estimate a/

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at approximately 10% of construction costs, item b.....		\$ 225
b. Construction costs.....		2,232
(1) Improvements to land.....	\$ 248	
(2) Material Handling Warehouse (25,000 sq. ft. @ \$75.56).....	1,889	
(3) Utilities including electrical power, water, and sewerage systems.....	95	
c. Removal less salvage b/.....		<u>515</u>
Subtotal.....		2,972
d. Contingency at approximately 10% of above costs.....		<u>298</u>
Total estimated construction costs (TECC).....		\$3,270 <sub>c/</sub>

a/ This estimate is based on a Conceptual Design Report dated December 1985.

b/ Demolition, off site disposal of materials, asbestos removal, restoration of site and moving of warehouse inventories cost for buildings 89, 90, 90 and 178.

c/ Escalation rates used were taken from DOE Departmental Price Change Index - FY 91 Guidance, August 1989 Update and were 4.2% (FY90), 4.6% (FY91), 5.5% (FY92) and 5.7 (FY93).

11. Method of Performance

Building design will be on the basis of a 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  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
PROJECT DATA SHEETS  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT CAPITAL AND 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: Roofing Improvements<br>Oak Ridge National Laboratory<br>Oak Ridge, Tennessee | 2. Project No.: 93-E-329 |
|---|--------------------------|
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|--|--|
| 3a. Date A-E work initiated (Title I design start scheduled): 1st Qtr. FY 1993<br><br>3b. A-E work (Title I & II) duration: 12 months<br><br>4a. Date Physical Construction Starts: 2nd Qtr. FY 1993<br><br>4b. Date Construction Ends: 4th Qtr. FY 1996 | 5. Previous construction cost estimate: None<br><br><br>6. Current construction cost estimate: \$15,000<br>TECC: \$15,000<br>TPC: \$15,070<br>Date: January 1992 |
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<u>7. Financial Schedule:</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$ 4,024	\$ 4,024	\$ 600
	1994	6,000	6,000	5,600
	1995	4,976	4,976	4,800
	1996	0	0	4,000

8. Brief Physical Description of Project

This project will replace deteriorated roofing on buildings and facilities throughout the Oak Ridge National Laboratory complex. ORNL has over 2.4 million square feet of roof area on approximately 160 buildings. Based on a recent study by the Laboratory's Plant and Equipment Division, approximately seventy percent of the total area needs to be replaced due to age and deterioration. This project is the first of several planned projects to replace the deteriorated roofing. It will replace the roofs that are in the worst condition (top priority) on buildings housing the most important facilities. Most of the existing roofing materials contain asbestos and much of it has traces of radioactive

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

PROJECT DATA SHEETS

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1. Title and location of project: Roofing Improvements  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee

2. Project No.: 93-E-329

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8. Brief Physical Description of Project (Continued)

contaminants. This project will provide for the installation of new roofing and includes the necessary engineered controls to assure compliance with applicable health and safety regulations.

Funding for FY 1993 will be used to perform design and to initiate contracts for the most critical roofs.

9. Purpose, Justification of Need and Scope of Project

The purpose of this project is to replace deteriorated roofing on buildings and facilities at ORNL. As mentioned in Item 8, ORNL has over 2.4 million square feet of roof area. Approximately seventy percent of the roofs have been in service for over 20 years. Because of age and deterioration, many of these roofs have already developed leaks and require an increasing amount of maintenance. The results of the Plant and Equipment Division study of these roofs giving the type and condition of each roof by building including conditions of asbestos and/or radioactive contamination were used as the basis of the conceptual design. In some cases the problems have reached the point that they could affect equipment, records, and research activities, as well as the health and safety of personnel working in the buildings or facilities.

During the past few years budget constraints and the increased cost of satisfying health, safety and environmental regulations have resulted in a reduction in funds available for roof replacement. The effects of this shortfall have been compounded by the increased cost associated with restrictions placed on work with or around asbestos materials. Most of the roofs needing replacement involve asbestos materials. This combination of factors has resulted in a growing backlog of roofs that need replacement due to a lack of adequate funding. The current average annual cost of roof repairs is \$800,000. This does not include damage from leaks before repairs are made. There is currently a backlog of over \$5 million of repairs needed. The roof replacement program is normally funded from expense funds; however, line item funding is requested because of the magnitude of the backlog and the need to provide an acceptable margin of response to meeting future replacement needs in a timely manner.

Failure to fund this project will result in a continuation of the expensive piece-meal repair program. As the roofs age, the number of leaks will increase, repairs will become more expensive and the potential for serious structural and equipment damage will grow along with the threat to employee health and safety. Further deterioration of facilities could result in decreased program funding for DOE and ORNL.

Use of the metric system of measurement for design, procurement and construction of this project was considered; but because of the nature of the work and the prevailing practices in the region it was determined to be uneconomical.

PROJECT DATA SHEETS

1. Title and location of project: Roofing Improvements  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee

2. Project No.: 93-E-329

10. Details of Cost Estimate a/

	<u>Total Cost</u>
a. (1) Engineering, design, and inspection at approx. 5.1% of constr. costs, items b and c.....	\$ 570
(2) Construction management costs approx. 9.5% of construction costs, items b and c.....	1,030
b. Construction costs (install new roofing)b/.....	3,170
c. Removal and packaging of existing roofing.....	<u>7,730</u>
Subtotal.....	12,500
d. Contingency at approximately 20% of above costs.....	<u>2,500</u>
Total estimated construction cost (TECC).....	\$15,000

a/ The cost estimate is based on conceptual design completed March 1991 at a cost of \$70,000. The DOE Headquarters Economic Escalation Indices for Construction Projects were used as appropriate over the project cycle.

b/ Construction costs include \$60,000 for readiness reviews.

11. Method of Performance

Design shall be performed under a negotiated architect-engineer contract and inspection shall be performed by the operating contractor. 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

	<u>Prior Years</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>Total</u>
a. Total Project Costs (TPC)						
(1) Total facility costs						
(a) Construction line item (TECC).	\$ 0	600	\$ 7,400	\$ 4,000	\$ 3,000	\$15,000
Total direct costs.....	\$ 0	\$ 600	\$ 7,400	\$ 4,000	\$ 3,000	\$15,000
(2) Other project costs						
(a) Conceptual design costs.....	\$ 70	\$ 0	\$ 0	\$ 0	\$ 0	\$ 70
Total other project related costs.	\$ 70	\$ 0	\$ 0	\$ 0	\$ 0	\$ 70
Total project costs (Items 1 & 2).....	<u>\$ 70</u>	<u>\$ 600</u>	<u>\$ 7,400</u>	<u>\$ 4,000</u>	<u>\$ 3,000</u>	<u>\$15,070</u>

b. Other Related Annual Costs (Estimated Life: 20 Years).....\$ 500

PROJECT DATA SHEETS

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1. Title and location of project: Roofing Improvements  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee

2. Project No.: 93-E-329

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

a. Total Project Funding

(1) Total facility costs

(a) Construction line item costs for design, procurement, removal of the old roofing, proper packaging of all project waste, and installation of the new roof are estimated to be \$15,000,000. This includes \$60,000 for readiness reviews.

(2) Other project costs

(b) Conceptual design costs

The conceptual design was completed March 1991 at a cost of \$50,000.

b. Other Related Annual Costs

The estimated useful life of the new roofs is 20 years.

(1) Other costs

The estimated average annual cost in FY 1993 dollars to repair the roofing installed by this project over the estimated 20 year life is \$500,000. This includes labor cost for 6 staff persons per year. The current estimated annual cost in FY 1993 dollars for repairing the existing roofing is \$800,000 including labor cost for 8 staff persons. Thus, the project annual savings is \$300,000. This comparison does not take into consideration the increasing cost of deterioration that will be incurred if the existing roofs are not replaced. This cost increase will result from structural and equipment damage due to leaks as well as the labor and material cost for the increasing number of repairs.

DEPARTMENT OF ENERGY  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
PROJECT DATA SHEETS  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Central Research and Support Building Oak Ridge National Laboratory Oak Ridge, Tennessee	2. Project No.: 93-E-328
3a. Date A-E work initiated (Title I design start scheduled): 1st Qtr. FY 1993 3b. A-E work (Title I & II) duration: 14 months 4a. Date physical construction starts: 4th Qtr. FY 1993 4b. Date construction ends: 4th Qtr. FY 1996	5. Previous construction cost estimate: None  6. Current construction cost estimates: TECC: \$ 12,400 TPC: \$ 12,710 Date: January 1992

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$4,400	\$4,400	\$1,100
	1994	5,000	5,000	4,000
	1995	3,000	3,000	4,200
	1996	0	0	3,100

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

## PROJECT DATA SHEETS

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| 1. Title and location of project: Central Research and Support Building<br>Oak Ridge National Laboratory<br>Oak Ridge, Tennessee | 2. Project No.: 93-E-328 |
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### 8. Brief Physical Description of Project

This project will construct a new multistory office building of approximately 50,000 sq ft as a replacement for a similar amount of obsolete temporary space. It will be located north of the Central Research Complex and will house a broad spectrum of research and support staff. The building will include individual offices and work stations for about 250 occupants. It will also include conference, training, storage, and work rooms as well as reception areas. A conference room for approximately 60 persons will be provided to serve the entire Laboratory. Furniture and equipment for the conference rooms, training rooms, and modular offices will also be provided.

The building structure will be steel with brick veneer and/or other low-maintenance exterior skin. A central HVAC system will provide cost-effective, energy-conserving space conditioning. Land improvements will include vehicle parking, service drives, walkways, drainage, and landscaping. Utilities will be extended from the existing distribution systems adjacent to the site and upgraded as required. Design/build concepts will be used for construction to the extent feasible.

First year funding will be used to initiate the design/build construction contract and related activities.

The project also includes the demolition of obsolete temporary buildings. Second and third year funding will be used to complete construction and for the engineering, decontamination, demolition and disposal of these buildings.

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

A large portion of the office space at the Oak Ridge National Laboratory (ORNL) is in deteriorated condition, overcrowded, and in some cases, does not comply with current Occupational Safety and Health Administration (OSHA) standards. This project is required to provide adequate replacement space for up to 250 people presently housed in inadequate facilities and provide an important first step in bringing ORNL into full compliance with all health and safety standards. The new building will house a broad spectrum of research and support personnel from a number of ORNL divisions.

Findings from the 1990 Tiger Team evaluation as well as recent self-assessment investigations of OSHA compliance at ORNL reveal that some office areas do not comply with OSHA requirements. Problems cited include overcrowded conditions resulting in blockage of access to electrical cabinets by furniture or equipment and, in some cases,

PROJECT DATA SHEETS

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|--|--------------------------|
| 1. Title and location of project: Central Research and Support Building<br>Oak Ridge National Laboratory<br>Oak Ridge, Tennessee | 2. Project No.: 93-E-328 |
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9. Purpose, Justification of Need and Scope of Project (Continued)

egress routes are partially blocked by equipment, file cabinets and book cases. Some space originally intended for use as attics or maintenance access has been converted to office areas, resulting in inadequate head space and egress deficiencies. Temporary corrective measures have been undertaken to vacate the worst of these areas through use of office trailers and rental office space. However, these deficiencies are most economically corrected through construction of new office space. In any case, this proposed building will provide only a first step in correcting office deficiency and regulatory compliance problems at ORNL.

In addition, the project is needed to help accommodate personnel that will be displaced due to asbestos abatement and facility restoration work on a major portion of the Central Research Complex. This work is part of another planned project for ORNL. Availability of the Central Research and Support Buildings (CRSB) would permit the asbestos abatement and restoration work to be accomplished with minimum exposure of Laboratory personnel, minimum disruption to Laboratory operations, and the lowest possible construction cost.

ORNL's office space deficiency has been a major, long-standing problem. Even before the 1990 Tiger Team and OSHA assessments, it was substantiated by the Real Property Inventory System (RPIS), the DOE Function Space Criteria, and the Federal Property Management Regulations, all of which indicate a critical current need of replacement office space. While there was a growth in population during the 1970s, only programmatic research facilities were constructed and they had few office spaces; the last dedicated office building was completed in the 1960s. With the start of the computer age in the 1970s, research began to shift from a laboratory to an office environment and this was reflected in DOE work at ORNL. During the 1980s there was a major increase in the number of guest researchers and subcontractors housed at ORNL. In recent years, over 2,000 guests/yr have required office space at the Laboratory. These external interactions are key to DOE's technology transfer program, but create significant demands on office space.

The Laboratory's response to the increased office population has been to make use of substandard office spaces built as temporary World War II structures, to convert labs to offices where possible, to construct a number of General Plant Project office buildings, to add trailers, to fill existing offices beyond their proper capacity, and to place offices in virtually every nook and cranny in the Central Research Complex.

PROJECT DATA SHEETS

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1. Title and location of project: Central Research and Support Building Oak Ridge National Laboratory Oak Ridge, Tennessee	2. Project No.: 93-E-328
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9. Purpose, Justification of Need and Scope of Project (Continued)

Identification of Alternatives

The alternatives to constructing the proposed replacement building are as follows:

- o Relocate various research and support staff to adequate office housing at other Oak Ridge sites (ORGDP, Y-12 Plant).
- o Rehabilitate the existing buildings to provide adequate long-term housing.
- o Modify other buildings to provide adequate office housing.
- o Construct multiple General Plant Project (GPP) facilities to replace the obsolete temporary space.
- o Lease off-site office space and relocate various activities to Oak Ridge or Knoxville.
- o Purchase of trailers or modular office housing units.

Throughout 1986 and 1987 the Laboratory pursued the possibility of relocating a significant number of personnel to ORGDP and Y-12 Plant as a means of providing immediate relief for its chronic office housing problems. This activity has shown that adequate office housing is very limited at these locations and is usually assigned to the installations' staff. This option would not be viable without another major reduction in the existing office staff housed at the other Oak Ridge installations. There are no known plans for such a reduction in the foreseeable future.

Rehabilitation of existing obsolete temporary buildings has been determined to be more costly than replacement. All of the rehabilitation work would have to be accomplished while the structures are occupied since no alternative space is available. This would be highly disruptive to ongoing operations.

PROJECT DATA SHEETS

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- |  |                          |
|--|--------------------------|
| 1. Title and location of project: Central Research and Support Building<br>Oak Ridge National Laboratory<br>Oak Ridge, Tennessee | 2. Project No.: 93-E-328 |
|--|--------------------------|
- 

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

Modification of other buildings at ORNL to provide adequate office housing has also been determined to be more costly than replacement. The existing adequate facilities with the potential for conversion to offices are currently laboratory/office facilities. The removal of adequate laboratory space from the ORNL inventory is not prudent since current and future programs are projected to require the continued use of this space as laboratories.

Construction of multiple GPP facilities as replacements for obsolete temporary space has been, and continues to be, a viable approach. Unfortunately the amount of remaining deficient space and the requirements to support utilities and other Laboratory needs makes the timing of this approach unacceptable.

The lease of off-site space has also been pursued by the Laboratory in recent years. Although some off-site rental space is in use, these arrangements are less efficient and are serving only as temporary measures until permanent buildings can be constructed on site.

The purchase of trailers or modular office housing is not an acceptable alternative since the purpose of this project is to provide permanent long-term housing and both trailers and modular housing are short-term approaches. The economic life of a trailer is 5-15 years and for modular housing is 10-20 years. The new building will have an economic life of 35-40 years or more. The cost of trailers or modular housing would be similar to that of the new building since a two story design is required to get the needed population on the available site.

In summary, the alternatives provide options with varying degrees of acceptability. Most of the alternatives cost significantly more than the proposed building. None offer the Laboratory appropriate housing in a reasonable time frame, at the lowest total cost. Only the proposed facility can accomplish this.

Use of the metric system of measurement for design, procurement and construction was considered for this project; but, because of its relatively small size and the prevailing practices in the region, it was determined to be uneconomical.



PROJECT DATA SHEETS

1. Title and location of project: Central Research and Support Building  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee

2. Project No.: 93-E-328

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

	<u>Prior Years</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>Total</u>
a. Total project costs (TPC)						
(1) Total facility costs						
(a) Construction line item.....	\$ 0	\$ 1,100	\$ 4,000	\$ 4,200	\$ 3,100	\$12,400
(b) Expense funded equipment.....	0	0	0	0	0	0
(c) Inventories.....	0	0	0	0	0	0
Total direct costs.....	\$ 0	\$ 1,100	\$ 4,000	\$ 4,200	\$ 3,100	\$12,400
(2) Other project costs						
(a) R&D necessary to complete construction.....	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
(b) Conceptual design costs.....	180	0	0	0	0	180
(c) Other project related costs...	130	0	0	0	0	130
Total other project related costs.	\$310	\$ 0	\$ 0	\$ 0	\$ 0	\$ 310
Total project costs (Items 1 & 2).	\$310	\$ 1,100	\$ 4,000	\$ 4,200	\$ 3,100	\$12,710
b. Other related annual costs* (Estimated Life: 50 Years)						
(1) Facility operating costs .....						\$ 385

\* These costs are expressed in FY 1993 dollars.

PROJECT DATA SHEETS

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1. Title and location of project: Central Research and Support Building Oak Ridge National Laboratory Oak Ridge, Tennessee	2. Project No.: 93-E-328
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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project costs

(1) Total facility costs

(a) Construction line item

Construction line item costs for the design, procurement, construction of the Central Research and Support Building and the demolition of existing structures are estimated to be \$12,400,000. This includes \$100,000 for readiness review of the demolition of existing structures known to be contaminated with asbestos and radioactive materials.

(b) Expense funded equipment

No narrative required

(c) Inventories

No narrative required

(2) Other project costs

(a) R&D necessary to complete construction

No narrative required

(b) Conceptual design costs

Cost of Conceptual Design Report and its FY 1985 and FY 1987 modification is \$180,000.

(c) Other project related cost

The cost of preparing the design criteria for Title I and II Design and for preparing the project management plan is projected to be \$130,000.

b. Other Related Annual Costs (Estimated Life: 50 Years)

(1) Facility operating costs

The annual costs to operate and maintain the facility including utilities, labor and material are estimated to be \$385,000. This includes maintenance and repairs, reconfiguration of office space, janitorial and other miscellaneous support services. Approximately four staff years of effort will be required to operate and maintain the facility. Similar costs for the facilities replaced by this project are \$485,000. The \$100,000 in savings is primarily from energy conservation features and labor savings due to decreased maintenance requirements.

PROJECT DATA SHEETS

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1. Title and location of project: Central Research and Support Building Oak Ridge National Laboratory Oak Ridge, Tennessee	2. Project No.: 93-E-328
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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements (Continued)

- (2) Programmatic operating expenses directly related to the facility  
No programmatic costs are shown because the building is a multiprogram general purpose facility. Between 20 and 40 percent of the occupants will be charging directly to several different programs activities. Some of these will be guest researches. The remainder of the occupants will be indirect support personnel.
  
- (3) Capital equipment not related to construction but related to the programmatic effort in the facility  
(See Item 13.b.(2) above.)
  
- (4) Maintenance, repair, GPP or other construction related to the programmatic effort in the facility  
(See Item 13.b.(2) above.)
  
- (5) Other costs  
No narrative required

DEPARTMENT OF ENERGY  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
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: Safety and Support Services Facility Lawrence Berkeley Laboratory Berkeley, California	2. Project No.: 93-E-327
3a. Date A/E work initiated, (Title I design start scheduled): 2nd Qtr. FY 1993	5. Previous construction cost estimate: None
3b. A/E work (Title I & II) duration: 10 months	6. Current construction cost estimate: \$9,900 TECC: \$9,900 TPC: \$10,100 Date: January 1992
4a. Date physical construction starts: 4th Quarter FY 1993	
4b. Date construction ends: 4th Quarter FY 1995	

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$2,980	\$2,980	\$ 950
	1994	4,470	4,470	2,900
	1995	2,450	2,450	4,450
	1996	0	0	1,600

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

PROJECT DATA SHEETS

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1. Title and location of project: Safety and Support Services Facility                      2. Project No.: 93-E-327  
Lawrence Berkeley Laboratory  
Berkeley, California
- 

8. Brief Physical Description of Project

The proposed Safety and Support Services Facility will be a three-story building of 34,970 net usable space and 42,000 GSF located near Buildings 69 and 75 with access from Centennial Drive and Cyclotron Road. This new building will consist of a rigid structural steel clear span frame with secondary structural members supporting pre-finished corrugated metal wall panels and insulated metal roof panels.

The building is designed for installation upon a concrete slab-on-grade and a foundation system to spread footing and friction piles. The second and third floors will be prefabricated modular steel frame units, independently supported by a tubular steel columnar system spaced 20 feet on center. Each floor module is covered with 1-1/8" plywood attached to the steel subframe for complete floor diaphragm continuity. Partitioned offices are prefabricated modular units that contain intergral ceiling and lighting systems. All other office space will be furnished with relocated open-plan modular furniture and partition systems. Site utilities, available at the site, will be modified or extended to fit the facility requirements. Distribution of utilities within the building will be designed for compatibility with the modular floor system. The building will be protected by a sprinkler system connected to the Lawrence Berkeley Laboratory (LBL) fire alarm system. A hydraulic passenger elevator of 4,000 pounds capacity services each floor.

Occupancy and net areas: Net Usable (3 Floors) = 34,970 S.F.  
Gross Enclosed Area = 42,000 S.F.  
Efficiency = 83%  
Total Occupancy will be 143 persons

Design and construction of the facility will comply with DOE 6430.1A and applicable codes and ordinances.

These new government-owned facilities will be located on leased land owned by the University of California and will serve or be operated in conjunction with other government-owned facilities at LBL.

## PROJECT DATA SHEETS

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1. Title and location of project: Safety and Support Services Facility                      2. Project No.: 93-E-327  
Lawrence Berkeley Laboratory  
Berkeley, California

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9. Purpose, Justification of Need and Scope of Project

Currently, LBL's Environmental and Safety Hazards Control (E&SHC) Health and Safety (EH&S) Department occupies a temporary trailer complex near Building 75 in a parking lot adjacent to a transportation terminal congested with trucks, buses, a radiation calibration range, and a temporary hazardous waste handling facility. Construction of the Safety and Support Services Facility will mitigate radiation, traffic and pedestrian hazards, permit removal of the trailer complex, and improve the efficiency and quality of EH&S operations.

LBL's Central Stores and Inventory Management occupy the first floor of Building 7, a substandard World War II wood frame structure, and an adjoining trailer. Electronics Engineering activities are located on the second floor. In its current condition the facility is in violation of NFPA 101, the Life Safety Code and the Improved Risk Program required by DOE Order 5480.7. Major violations include:

- o Entire structure constructed of combustible materials
- o Inadequate separation of warehousing space from office space
- o Egress systems and exit corridors composed of flammable materials
- o Flammable electrical cables and wires in exit corridors
- o Ineffective sprinkler system

Should a fire occur, these deficiencies represent a life threatening condition to the occupants and could precipitate a severe loss of property.

When construction of the Safety and Support Services Facility is complete, Central Stores and other Material Management operations will be combined in the new building in close proximity to other allied administration operations in adjoining Building 69, including Purchasing, Business Services, Receiving, Shipping, and Transportation. This consolidation will substantially increase the efficiency of these activities. Electronics Engineering activities will also be moved into the new building so that Building 7 can be demolished and related trailers occupied by Electronics and Material Management can be removed.

PROJECT DATA SHEETS

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1. Title and location of project: Safety and Support Services Facility Lawrence Berkeley Laboratory Berkeley, California	2. Project No.: 93-E-327
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9. Purpose, Justification of Need and Scope of Project (Continued)

In summary, construction of the Safety and Support Services Facility will enable the EH&S Department, Central Stores and Material Management and Electronics Engineering activities to move from substandard, obsolete or temporary trailers into space in proximity to allied operations to maximize effectiveness and efficiency. The relocation of the EH&S Department will eliminate safety hazards associated with proximity to the Radiation Calibration operation. The removal of Building 7 (and adjacent trailers) and the existing EH&S trailer complex near Building 75 will significantly enhance personnel safety and eliminate the costly maintenance of these substandard facilities. Traffic and pedestrian safety hazards will be mitigated in both the new building site area and the Building 7 area. The future redevelopment of the "Original Laboratory Site," which is the key element in the LBL Site Development Plan, will be greatly facilitated, substantially decreasing future costs and disruptions to research support activities.

10. Details of Cost Estimate a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. (1) Engineering, design and inspection approximately 11% of construction costs, item b 1,2,3,4.....		\$ 800
(2) Construction management at approximately 4% of construction costs..		300
b. Construction costs.....		7,260
(1) Improvements to land.....	\$ 660	
(2) Building (42,000 GSF @ \$124/SF).....	5,230	
(3) Special Facilities.....	910	
(4) Utilities.....	250	
(5) Project Management (3% of construction costs, item b 1,2,3,4.....	210	
c. Standard Equipment.....		20
d. Relocations.....		420
Subtotal.....		8,800
e. Contingency approximately 13% of construction cost.....		1,100
Total estimated construction cost (TECC).....		\$9,900

a/ Conceptual design is complete. Title II design is 75% complete. PED requirements: None. Construction costs have been escalated at 1.2% for FY 1989, 3.1% for FY 1990, 3.6% for FY 1991, 4.5% for FY 1992, 5.1% for FY 1993 and 5.6% for FY 1994; and 5.7% for FY 1995; compounded to midpoints of phased construction.

PROJECT DATA SHEETS

1. Title and location of project: Safety and Support Services Facility  
 Lawrence Berkeley Laboratory  
 Berkeley, California

2. Project No.: 93-E-327

11. Method of Performance

Design is 75% complete. Title II drawing will be completed by the LBL Plant Engineering staff. 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

	<u>Prior Years</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>Total</u>
a. Total project costs (TPC)						
1. Total facility costs						
(a) Construction line item (TECC).	\$ 0	\$ 950	\$2,900	\$4,450	\$1,600	\$ 9,900
Total direct costs.....	\$ 0	\$ 950	\$2,900	\$4,450	\$1,600	\$ 9,900
2. Other project costs						
(a) Conceptual design costs.....	50	0	0	0	0	50
(b) Environmental and Safety (NEPA and SAD) documentation costs..	100	50	0	0	0	150
Total other project related costs	150	50	0	0	0	200
Total project costs (Items 1 & 2)	<u>\$150</u>	<u>\$1,000</u>	<u>\$2,900</u>	<u>\$4,450</u>	<u>\$1,600</u>	<u>\$10,100</u>
b. Other related funding requirements (estimated)						
1. Facility operating costs.....					\$ 230	

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. Other related annual costs
1. Facility operating costs: Includes estimated cost for maintenance, custodial service and utilities such as light, heat, and water.
2. No programmatic activities will be located in this facility. The support activities to be conducted in the facility are described in Section 9 above.

DEPARTMENT OF ENERGY  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
PROJECT DATA SHEETS  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Laboratory Addition Building 205 Argonne National Laboratory Argonne, Illinois	2. Project No.: 93-E-326
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3a. Date A-E work initiated (Title I design start scheduled): 2nd Qtr FY 1993	5. Previous cost construction estimate: None
3b. A-E work (Titles I & II) duration: 12 months	
4a. Date physical construction starts: 4th Qtr FY 1994	6. Current construction cost estimate: \$5,750
4b. Date construction ends: 4th Qtr FY 1996	TECC: \$5,750 TPC: \$5,835 Date: January 1992

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$ 620	\$ 620	\$ 360
	1994	2,770	2,770	1,000
	1995	2,360	2,360	3,360
	1996	0	0	1,030

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

PROJECT DATA SHEETS

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1. Title and location of project: Laboratory Addition  
Building 205  
Argonne National Laboratory  
Argonne, Illinois

2. Project No.: 93-E-326

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8. Brief Physical Description of Project

This project provides for the design, procurement and construction of a 21,880 gross square foot laboratory and office building addition located on vacant land, east of "D" Wing of Building 205. This addition will provide the concentration, reorganization and accommodation of the present and anticipated functions, requirements, and missions of the Analytical Chemistry Laboratory (ACL) at ANL-East.

The building addition will be designed for a 25 year life and will consist of a service floor, two laboratory/office floors, and a mechanical penthouse. The building will be approximately 80 feet wide x 122 feet long x 31 feet in height.

Included in the project scope are necessary site development such as roadways, loading dock, and landscaping. Utility requirements will be provided by connecting into nearby domestic fire and chilled water piping; steam piping; sewers; and telephone services.

The building will be constructed of exterior red face-brick, cavity load bearing walls. The super-structure will consist of pre-stressed concrete planks supported on exterior and interior load bearing masonry walls. Fenestration will consist of aluminum therma-break windows with insulated glass. Vinyl floors will be used in laboratories and carpeting in offices. Partitioning systems compatible with use, flexibility, and life cycle costs will be concrete block and drywall. Acoustical ceilings will be used throughout except in storerooms, service floor, and penthouse.

The heating and air conditioning will be a variable air volume system with corridor pressure control and designed for maximum life cycle costed energy efficiency.

Electrical energy for the addition will be supplied from an existing 13,200 volt feeder in Building 205.

PROJECT DATA SHEETS

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1. Title and location of project: Laboratory Addition  
Building 205  
Argonne National Laboratory  
Argonne, Illinois

2. Project No.: 93-E-326

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8. Brief Physical Description of Project (Continued)

Building occupancy will consist of:

Laboratories for organic testing and evaluations, wet chemistry, handling potential carcinogenics, analytical analysis, and instrumentation.

Offices for ACL Manager, Staff Scientists, Group Leaders, and Manager's Secretary.

Space for secretarial group, files, fax, and copier.

Receiving and shipping area will provide for receiving samples at a point of use location and increase the efficiency of handling all dock functions.

A sample unloading room will reduce the contamination that might occur through spillage or breakage of samples.

Walk-in cold rooms adjacent to the dock elevator and sample unloading room and on the Service Floor for efficient movement and storage of samples.

An elevator for material and personnel conveyance to the various floors. Elevator service in the existing building is too remote to provide effective service to the addition.

Gas cylinder storage room to provide safe and convenient storage for the various laboratory gases.

Toilet rooms for approximately 35 people (50% men, 50% women).

Sample storage for storage of empty coolers and analytical sample containers, to provide archival storage of samples retained for legal purposes, and to provide space for excess samples.

Equipment storage for storage of glassware inventory, instrument spare parts, and solvent storage cabinets.

PROJECT DATA SHEETS

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|---|--------------------------|
| 1. Title and location of project: Laboratory Addition<br>Building 205<br>Argonne National Laboratory<br>Argonne, Illinois | 2. Project No.: 93-E-326 |
|---|--------------------------|

8. Brief Physical Description of Project (Continued)

Service floor to provide space for retention tanks, walk-in coolers, sample unloading, elevator, elevator equipment, mechanical and electrical equipment, and utilities and sewer services.

Mechanical and electrical roof penthouse to enclose major mechanical and electrical equipment.

9. Purpose, Justification of Need and Scope of Project

Argonne's Analytical Chemistry Laboratory (ACL) expanded its activities in several areas, most notably environmental analysis. Current space in Buildings 200, 203, 205, and 211 has not adequately accommodated the addition of over 15 FTEs in the last 3 years, and cannot accommodate an additional increase of 11 FTEs anticipated in the next 5 years. To relieve the crowding condition created by additional ACL staff and equipment, the new building addition to 205 will give the needed expanded space and the desired consolidation of certain ACL groups now dispersed in Buildings 200, 203, 205, and 211.

The space analysis is as follows:

<u>Building</u>	<u>Existing ACL Space (NSF)</u>	<u>Existing ACL Space Vacated (NSF)</u>	<u>New Bldg. ACL Space (NSF)</u>
200	10,127	1,000	
203	1,480	1,480	
205	10,211	4,704	
211	1,768	1,768	
New Bldg. Addn	<u>0</u>	<u>0</u>	<u>10,400</u>
	23,586 NSF	8,952 NSF	10,400 NSF

Net Space Increase: 10,400 NSF - 8,952 NSF = 1,448 NSF

Total ACL Net Space: 23,586 NSF + 1,448 NSF = 25,034 NSF

The space being vacated in the various buildings will be readily absorbed by the remaining building occupants.

PROJECT DATA SHEETS

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1. Title and location of project: Laboratory Addition Building 205 Argonne National Laboratory Argonne, Illinois	2. Project No.: 93-E-326
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9. Purpose, Justification of Need and Scope of Project (Continued)

Currently, ACL has 6 analytical instruments and up to 8 chemists working in 3 labs in Building 211 handling potentially toxic samples for the DOE programs. For some of the environmental survey analyses, the preparation is conducted in Building 211 and the instrument analysis is done in Building 205; this means that extracts must be transported outside, causing both inefficiencies in operations as well as additional safety problems. This overcrowding was noted in a report by auditors for the DOE Environmental Survey as an unacceptable condition. There are no standards available on the size of laboratory space that is adequate per scientist. The 540 square foot lab for 2.5 persons in this proposal is based on the long standing in-house experience, wherein, CMT typically allocates 250 sq. ft. per scientist. Also, no additional space is available to allow for required expansion due to increased secretarial needs, sample preparation needs, and data and archival storage needs.

Increased work with potentially hazardous environmental samples, especially potential carcinogens, requires special handling and adequate ventilation. It is anticipated that older laboratory space will not be adequate as new standards are set forth for safe handling of these samples. In Building 211, the current HVAC systems cannot handle the load -- several days of analyses were lost due to summer temperature changes in the laboratories which caused instruments to drift out of calibration.

Current laboratory space is inadequate for current needs. Although the DOE Environmental Survey Program concluded in FY 1990, ACL continues to analyze environmental samples for a number of DOE sites. In planning to meet DOE environmental and waste management analytical needs, additional space will be needed, particularly dealing with mixed wastes.

In addition to planned expansion, the Environmental Survey Program has been impacted by the limited capacity, especially in the organic analysis area, to meet their sample loads. Currently, capacity is space-limited for many of the analysis requests.

Long-term plans in ACL call for continued expansion of the staff and facilities to perform analyses for DOE and Argonne programs. In addition, more emphasis is being placed on analysis requests which cross the boundaries of the four groups -- e.g., organometallic specification and mixed hazardous/radiological waste characterization,

PROJECT DATA SHEETS

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1. Title and location of project: Laboratory Addition Building 205 Argonne National Laboratory Argonne, Illinois	2. Project No.: 93-E-326
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9. Purpose, Justification of Need and Scope of Project (Continued)

thus, there will be an increasing need for the four ACL groups to interact and be physically closer. Transportation of samples between buildings, which can be done safely, poses some risk and extra effort, particularly if weather conditions are adverse.

The current facilities also have numerous safety limitations. The spaces are crowded to the point of presenting a safety concern. Chemicals and reagents are stored in the hallways. Hoods are in short supply. Regulations are getting tighter and the analysis requests increasingly deal with hazardous or toxic chemicals. Thus, safety concerns, also increasing, require that additional space be available to ACL for proper conduct of work.

Another factor is that space for ACL operations in Building 200 is restrictive. There will be a space issue problem with the planned addition of a clean room, a laboratory for preparation of environmental samples, and two new instruments. The proposed building addition will provide the needed space to transfer operations from Building 200.

The new building addition to 205 will consolidate most of ACL in one area with a closer working relationship. New space will permit locating chemists who work on the same project and analyze the same sample to be in the same proximity. New space will solve safety concerns and will improve the efficiency and safety of ACL operation and the quality of work.

The programming analysis of the ACL spaces and their relative locations has explicitly illustrated that ACL cannot expand into adjacent spaces nor relocate into existing facilities sufficient in size and configuration to fulfill their present and future missions. Therefore, if the addition is not constructed, inter-related activities and personnel will remain dispersed throughout the Laboratory site. Sample transfers, interaction and analytical interfacing will become increasingly difficult and inefficient and the lack of space for effective operation and growth will severely encumber the functions and efficacy of the increased ACL staff.

Overcrowding, excessive travel time and deficient work environment will place undue burdens and impair the morale and professionalism associated with this department. In addition, the physical plant inefficiencies

PROJECT DATA SHEETS

1. Title and location of project: Laboratory Addition  
 Building 205  
 Argonne National Laboratory  
 Argonne, Illinois

2. Project No.: 93-E-326

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

inherent in some of the mechanical and electrical systems will remain unchanged, and potential problems with fire prevention, safety and health will continue. In conclusion, there is no viable alternative to the proposed action.

10. Details of Cost Estimate a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. (1) Engineering, design, and inspection at approximately 13% of construction costs.....		\$ 556
(2) Construction management at 3% of construction costs.....		129
(3) Project management at 1% of construction costs.....		43
b. Construction costs.....		4,113
(1) Improvements to land (sitework), including grading and landscaping.....	\$ 44	
(2) Building (21,800 sf x \$180/sf).....	3,947 <u>b/</u>	
(3) Utilities, including electrical power, water, sewers, steam, chilled water, telephone.....	122	
c. Standard equipment: office furniture.....		<u>158</u>
Subtotal.....		4,999
d. Contingency at approximately 15% of above costs.....		<u>751</u>
Total estimated construction cost (TECC).....		\$5,750 <u>c/</u>

a/ The above estimates are based on completed conceptual design and current cost data.

b/ Includes fixed casework and lab bench costs; relocation costs of equipment and apparatus from existing buildings; and costs for Environment, Safety and Health Construction requirements and for a safe and healthful work place.

c/ All costs have been escalated from January 1991 to the midpoint of construction at the rate of 1.236. Escalation rate methodology is based upon FY 1992 Guidance dated August 1990: FY 1991 - 3.6%, FY 1992 - 4.5%; FY 1993 - 5.1%, FY 1994 - 5.6%, FY 1995 - 5.7%, and FY 1996 - 5.7%.

PROJECT DATA SHEETS

1. Title and location of project: Laboratory Addition Building 205 Argonne National Laboratory Argonne, Illinois	2. Project No.: 93-E-326
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11. Method of Performance

Engineering and design will be performed under a negotiated A/E contract with guidance, review and monitoring by Laboratory personnel. Inspection will be performed by Laboratory personnel aided by the A/E firm. Construction management and project management will be performed by Laboratory personnel. Construction will be accomplished by fixed-price lump sum contract awarded on the basis of competitive bidding.

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

	Prior Years	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	Total
a. Total project costs (TPC)								
(1) Total facility costs								
(a) Construction line item (TECC)	\$ 0	\$ 0	\$ 0	\$ 360	\$1,000	\$3,360	\$1,030	\$5,750
Total direct costs.....	\$ 0	\$ 0	\$ 0	\$ 360	\$1,000	\$3,360	\$1,030	\$5,750
(2) Other project costs								
(a) Conceptual design costs.....	\$ 65	\$ 12	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 77
(b) Documentation costs.....	5	3	0	0	0	0	0	8
Total other project related costs	\$ 70	\$ 15	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 85
Total project costs (Items 1 and 2).....	\$ 70	\$ 15	\$ 0	\$ 360	\$1,000	\$3,360	\$1,030	\$5,835
b. Total related annual costs (estimated life of building: 25 yrs.)								
		<u>Existing</u>			<u>New</u>		<u>Change</u>	
(1) Facility operating costs.....		8952 NSF			10,400 NSF		+1,448 NSF	
		\$137.8			\$157.0		+\$ 19.2	

PROJECT DATA SHEETS

1. Title and location of project: Laboratory Addition  
 Building 205  
 Argonne National Laboratory  
 Argonne, Illinois

2. Project No.: 93-E-326

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

- a. Total project costs (TPC)
- (1) Total projects costs  
 No narrative required.
  - (1) Other project costs
    - (a) Conceptual design costs are for Conceptual Design Reports.
    - (b) Documentation costs include preparation of project data sheets, design criteria, and Environmental Evaluation Notification Form (DOE-CH 560).
- b. Total related annual costs
- (1) Facility operating costs are a summation of the following Cost Items:

<u>Cost Component</u>	Vacated Existing	Proposed New	<u>Change</u>
	<u>ACL Space</u> 8952 NSF	<u>ACL Space</u> 10,400 NSF	
Building Maint.	\$ 16.2	\$ 19.0	\$ 2.8
Utilities	106.4	124.0	17.6
Custodial	14.0	14.0	0
Major Repairs	<u>1.2</u>	<u>0.0</u>	<u>( -1.2)</u>
	\$ 137.8	\$ 157.0	\$ 19.2

- (2) Programmatic operating expenses directly related to the facilities: ACL has projected a need in FY 1996 of 11 additional staff if this building addition is not constructed, and 9 additional staff if this building addition is constructed. Therein, this building addition increases available space to remedy extreme overcrowding conditions and will produce efficiencies that will result in a savings of \$419,000/year beginning in FY 1996.
- (3) There is no capital equipment related to the programmatic effort of the facility due to the relocation of existing equipment from the existing buildings.
- (4) There is no maintenance, repair, GPP or other construction related to programmatic effort in this new facility.

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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: Potable Water System Upgrade - Phase I<br>Brookhaven National Laboratory<br>Upton, New York | 2. Project No.: 93-E-325  |
| 3a. Date A/E work initiated, (Title I design start scheduled): 1st Qtr. FY 1993   | 5. Previous construction cost estimate: None  |
| 3b. A/E work (Title I & II) duration: 8 months  | 6. Current construction cost estimate: \$5,250<br>TECC: \$5,250<br>TPC: \$5,250<br>Date: January 1992 |
| 4a. Date physical construction starts: 4th Quarter FY 1993  |   |
| 4b. Date construction ends: 4th Quarter FY 1994   |   |

<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$3,500	\$3,500	\$ 875
	1994	1,750	1,750	2,375
	1995	0	0	2,000

8. Brief Physical Description of Project

This project commences the upgrade of potable water system as outlined in the Master Plan, Potable Water System 1989-2000. This project represents the first of several phases of an overall planned program to rehabilitate and improve the BNL potable water supply and will insure that an adequate supply of good quality potable water is available for the laboratory through the year 2000 and beyond.

Included in this first phase of work are the following improvements:

- a. Installation of carbon absorption filtration systems to remove volatile organic compound contamination on main wells that supply water to the laboratory in the following sequence: Wells 10, 12, 4, 6, and 7.
- b. Replacement of the existing 4,000 feet of cast iron pipe with cement-lined ductile iron pipe to eliminate the existing problem with low pressure/flow.

PROJECT DATA SHEETS

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1. Title and location of project: Potable Water System Upgrade - Phase I Brookhaven National Laboratory Upton, New York	2. Project No.: 93-E-325
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8. Brief Physical Description of Project (Continued)

- c. Partial replacement of 1,750 feet out of a total of 35,000 feet of "transite" pipe to eliminate the future possibility of asbestos contamination of the water.
- d. Installation of additional equipment at each well station to improve the safety of the existing chlorine gas disinfection system located at each well station.

9. Purpose, Justification of Need and Scope of Project

- a. Well Stations - The existing nine potable water wells date back to 1941. Of these nine, the three oldest have been decommissioned because of volatile organic contamination. Of the remaining six wells, only one, No. 7, does not show signs of contamination.

Since this well is capable of only providing approximately half of the water requirements for the laboratory, steps must be taken to insure a safe, adequate supply of water into the future when considering the fact that the chemical contamination intrusion appears to be spreading. Eventually all of the wells may be affected. In addition, the Federal Government is in the process of tightening the current drinking water standards.

A means of insuring a long term and reliable service of safe potable water must be implemented. The drilling of new wells is not a viable alternative because of the uncertainty of the quality of the water from the new well(s). Previous studies have determined that the most cost-effective approach is the installation of a carbon adsorption filtration system at each well station. Because all of the wells are of the same capacity (1,200 gpm), a single modular design system can be purchased, and installed on a segmental basis at minimum cost, time and disruption.

Although Well No. 7 does not yet show contamination, the program plans for installation of carbon adsorption units on this well, anticipating the probable spread of the existing contamination problems. BNL is currently installing a prototype carbon adsorption system on Well No. 11. Operating experience gained on this installation will be utilized for the proposed systems on the other wells.

Five carbon adsorption filtration units will be installed as part of this Phase I work for Well Nos. 4, 6, 7, 10, and 12.

PROJECT DATA SHEETS

1. Title and location of project: Potable water system upgrade - Phase I  
 Brookhaven National Laboratory  
 Upton, New York

2. Project No.: 93-E-325

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

- b. Cast Iron Piping - The 4,000 feet of cast iron piping supplying the area south of Bell Avenue needs to be replaced to eliminate the unacceptable iron contact levels (resulting in discoloration and sediment) in the water, due to the corrosion on the interior of the cast iron pipe. Corrosion and scaling have also contributed to high pressure drops in the distribution piping, which inhibits fire fighting flow availability.
- c. Transite Piping - Approximately 35,000 feet of transite pipe are part of the laboratory's potable water system. Some of this pipe dates back as far as the 1940s. In order to eliminate the potential health hazard of asbestos contamination of the potable water system, it is necessary to replace this pipe with cement-lined ductile iron pipe.

Because of the large quantity of pipe involved, in all sizes from 4" to 24" diameter, and because the piping covers a wide physical area of the laboratory grounds, the only practical engineering approach is to replace the pipe in sections. The total area has been divided into smaller subareas so that the pipe replacement can be performed in a manageable fashion. These subsurfaces have been selected on the basis of each forming a contiguous region that could be replaced with minimum disruption of service and minimum number of interconnections with adjoining areas.

Because of the large amount of transite piping involved and the budget for Phase 1, only 1,750 feet of transite piping will be replaced at this time.

10. Details of Cost Estimate a/

	<u>Item Cost</u>	<u>Total Cost</u>
a. (1) Engineering, design, and inspection and administration at approximately 14% of construction costs, item b.....		\$ 578
(2) Construction management at 2% of construction costs, Item b.....		63
b. General Construction.....		3,150
(1) Well Station Treatment.....	\$ 2,280	
(2) Replacement of Cast Iron and Transite Pipe.....	870	
c. BNL Furnished Equipment (5 carbon adsorption systems).....		980
Subtotal.....		\$ 4,771
d. Contingency at approximately 10% of above costs .....		479
Total estimated construction cost (TECC).		\$ 5,250

a/ The estimate is based on a conceptual design. Escalation rates used were taken from DOE Departmental Price Change Index - FY 92 Guidance, August 1990 Update.

PROJECT DATA SHEETS

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1. Title and location of project: Potable Water System Upgrade - Phase I  
Brookhaven National Laboratory  
Upton, New York

2. Project No.: 93-E-325

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11. Method of Performance

Design and inspection will be on the basis of negotiated architect-engineer contract. Construction and procurement will be accomplished by a competitively obtained lump sum contract.

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: Underground Power and Communication System Upgrade - Phase I  
 Brookhaven National Laboratory  
 Upton, New York

2. Project No. 93-E-316

3a. Date A-E initiated, (Title I design start scheduled): 2nd Qtr FY 1993

5. Previous construction cost estimate: None

3b. A-E work (Title I & II) duration: 15 months

4a. Date physical construction starts: 4th Qtr FY 1993

6. Current construction cost estimate: \$3,600  
 TECC: \$3,600  
 TPC: \$3,600  
 Date: January 1992

4b. Date construction ends: 4th Qtr FY 1995

<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	FY 1993	\$1,400	\$1,400	\$ 200
	FY 1994	2,200	2,200	2,200
	FY 1995	0	0	1,200

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

PROJECT DATA SHEETS

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1. Title and Location of project: Underground Power and Communication System Upgrade - Phase I  
Brookhaven National Laboratory  
Upton, New York

2. Project No. 93-E-316

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8. Brief Physical Description of Project

This project provides for the first phase of the replacement of old and deteriorating underground electrical cables, the addition of underground ductbanks to replace damaged portions and support new cabling, the installation of a new 13.8 kV - 2.4 kV substation, and the retrofitting of switchgear power circuit breakers. The project consists of the following elements:

The existing underground ductbanks will be replaced and supplemented with new concrete encased plastic ducts, to allow for the replacement of power and communication services that have exceeded their useful life. All electric service interruption will be held to a minimum and no major power cut off is anticipated.

The new 13.8 to 2.4 kV substation will provide additional power to the southeast portion of the Laboratory and balance the power flow through the 2.4 kV distribution grid.

Included are modifications to existing electric switchgear, buildings, etc. to accept the new and modified electric power distribution system. New conduit from the central ductbank will be installed to the existing electric distribution equipment. Communication conduits will be run in the same trench as the power conduit ductbank wherever possible when justified, based on analysis of current conditions and future requirements. New gas filled switches and associated equipment will be installed where existing equipment is being removed as part of the underground electric cable replacement. All existing cables removed from service will be abandoned in place unless their removal is required to install new feeders. Existing electrical switchgear power circuit breakers in need of repair will be retrofitted with new solid state trip devices to provide proper protection to personnel and equipment.

## PROJECT DATA SHEETS

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1. Title and Location of project: Underground Power and Communication System Upgrade - Phase I Brookhaven National Laboratory Upton, New York	2. Project No. 93-E-316
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9. Purpose, Justification of Need and Scope of Project

There have been numerous failures in the existing underground cables. Extensive electric service interruptions have been experienced affecting both programmatic and non-programmatic facilities.

Cable failures began to occur about 10 years ago and the rate of failure has increased to 2 to 3 occurrences per year. Experience has shown that repairs performed on an emergency basis require a minimum of 48 to 72 hours. It is anticipated that interruptions will continue and increase in number as the average cable life is exceeded. The estimated useful life of electric power cables is 30-40 years. Eight of the paper insulated lead covered cables serving the scientific and support facilities are 40 years old.

Some sections of the existing ductbank system have collapsed or have settled with respect to electric manholes. Additional physical stress has been placed on these electric cables in the form of shear and/or compression.

The new 13.8 to 2.4 kV substation will provide additional power to the southeast portion of the site which is now fed through the 2.4 kV distribution grid. During periods when one of the existing three substations is down for maintenance, power flow through the bottleneck portions of the grid exceed capacity and cause localized overheating. This new substation will eliminate the bottleneck and provide needed power during prolonged emergency situations, such as a total loss of one of the three major distribution substations.

Switchgear breakers are currently being serviced, but BNL cannot always bring them back into manufacturer's specifications due to deterioration and age of materials.

It is imperative that funding for this project be authorized to diminish the risk and downtime impact of electric power interruption which affect scientific programs.

PROJECT DATA SHEETS

1. Title and Location of project: **Underground Power and Communication System Upgrade - Phase I**  
**Brookhaven National Laboratory**  
**Upton, New York**

2. Project No. **93-E-316**

10. Details of Cost Estimate a/

	<u>Item Cost</u>	<u>Total Cost</u>
a. (1) Engineering, design, and inspection at 14.5% of item b .....		\$ 397
(2) Construction management at 3% of construction costs, Item b .....		82
b. Construction Costs .....		2,735
(1) Ductbank & Feeder Construction.....	\$1,611	
(2) 13.8 kV - 2.4 kV Substation Installation.....	564	
(3) Power Circuit Breaker Retrofit.....	207	
(4) BNL Supplied Items.....	353	
(a) Substation.....	\$155	
(b) 15 kV Switches.....	198	
Subtotal.....		<u>3,214</u>
c. Contingency @ approximate 12% of cost.....		<u>386</u>
Total estimated construction costs (TECC).....		<u>\$3,600</u> b/

- a/ The above estimates are based on the Conceptual Design Report dated December 1989.
- b/ Escalation rates were taken from DOE Departmental Price Change Index - FY 91 Guidance, August 1989 Update and were 4.2% (FY 90), 4.6% (FY91), 5.5% (FY92), 5.7% (FY93) and 5.8% (FY94).

PROJECT DATA SHEETS

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1. Title and Location of project: Underground Power and Communication System Upgrade - Phase I  
Brookhaven National Laboratory  
Upton, New York

2. Project No. 93-E-316

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11. Method of Performance

Engineering, design and inspection will be performed by the operating contractor. 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.

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

Not required.



PROJECT DATA SHEETS

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1. Title and location of project:	Sitewide Conventional Substation Feeder Improvement Stanford Linear Accelerator Center Stanford, California	2. Project No. 93-E-314
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8. Brief Physical Description of Project

This project improves the reliability of the SLAC site 12.47 kV electrical feeder system. The project will replace the C-2 (partial), C-3, C-4 cables which run from the master substation to the linac's conventional substations and master substation to research area substation feeder cables C-9 and C-10. These cables extend from the master substation to some laboratory conventional substations and the research area substation. The replacement will include all cable splices and cable termination associated with the new cable.

Major items included in the scope for replacement are: 55 three conductor high voltage cable sections; 30 inline three-conductor splices; and 49 three conductor cable stress cone terminations.

9. Purpose, Justification of Need and Scope of Project

This project will replace and correct serious shortcomings in the 12.47 kV distribution system from the master substation to the accelerator's conventional substations as well as provide reliable power to the Research Area substation. The project will bring the high voltage feeders C-2 (partial), C-3, C-4, C-9 and C-10 to current National Electric Code (NEC) standards and safety requirements. The existing paper insulated lead covered (PILC) cable feeders are reaching the end of their useful life and must be replaced.

In addition, the termination in the high voltage switch compartments are leaking oil and no-void compound. The oil and no-void are expelled during normal thermal cycles, causing the cable to absorb moisture and air. This has continued even after repairs have been attempted. In 1991, five sections of the C-2 cable were replaced because of extensive insulating oil and no-void eruption blowing out through pressure tightened gaskets. This type of condition will result in a major failure of site high voltage conventional distribution feeders unless the feeder system is replaced. Consequently, unplanned shutdowns in operations could occur.

PROJECT DATA SHEETS

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1. Title and location of project:	Sitewide Conventional Substation Feeder Improvement Stanford Linear Accelerator Center Stanford, California	2. Project No. 93-E-314
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10. Details of Cost Estimate a/

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at 15% of construction costs, Item b.....		\$ 250
b. Construction Costs.....		1,680
(1) Cable.....	\$1,031	
(2) Splices.....	23	
(3) Terminations.....	26	
(4) Removal and Installation.....	600	
Subtotal.....		<u>\$ 1,930</u>
c. Contingency at 15% of above costs.....		<u>290</u>
Total estimated construction cost (TECC).....		<u>\$ 2,220</u> b/

a/ All costs are escalated to the mid-point of construction. The rates used are 3.6, 4.5 and 5.1 percent for the years FY 1991, FY 1992, and FY 1993 respectively, as shown in the "DOE Department Price Change Index," dated August 1990.

A Conceptual Design Report (CDR) for the project has been completed.

PROJECT DATA SHEETS

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1. Title and location of project:	Sitewide Conventional Substation Feeder Improvement Stanford Linear Accelerator Center Stanford, California	2. Project No. 93-E-314
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11. Method of Performance

Engineering, design and inspection will be done by SLAC personnel. Procurement and construction will be accomplished by fixed price contracts and subcontracts awarded by SLAC 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:	Electrical System Upgrade - Phase II Argonne National Laboratory Argonne, Illinois	2. Project No. 93-E-313
3a. Date A/E work initiated, (Title I design start scheduled):	2nd Qtr. FY 1993	5. Previous construction cost estimate: None
3b. A/E work (Title I & II) duration:	8 months	6. Current construction cost estimate: \$5,100
4a. Date physical construction starts:	2nd Quarter FY 1994	TECC: \$5,100
4b. Date construction ends:	4th Quarter FY 1995	TPC: \$5,259 Date: January 1992

<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$3,000	\$3,000	\$ 750
	1994	1,500	1,500	1,700
	1995	600	600	1,375
	1996	0	0	1,275

PROJECT DATA SHEETS

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1. Title and location of project:	Electrical System Upgrade - Phase II Argonne National Laboratory Argonne, Illinois	2. Project No. 93-E-313
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8. Brief Physical Description of Project

The project provides for the rehabilitation of the main electrical distribution system and major components in the 200 area. The work consists of the following:

Replace the Inner Circle Drive 13.2 kV underground vault feeder loop switches, underground main feeder loop cables (B1, B2, B3 and B4) and building service lateral cables in 200 Area with type EPR cables and an underground conduit system. Replace below grade switch vaults. Replace 15 kV exterior automatic transfer switches. Provide a Central Control Station for the Site-wide Electrical Distribution System, with instrumentation and control of major components of the system.

9. Purpose, Justification of Need and Scope of Project

- a. The 13.2 kV main feeder automatic transfer switch equipment is over 30 years old. Malfunctions on the switches have occurred. Maintenance of these switches is becoming increasingly difficult due to inability to obtain spare parts. A complete replacement, employing the present state-of-the-art technology, is recommended to insure safe, reliable, and continuous operation of the Laboratory's programmatic experiments.
- b. The 13.2 kV loop switches located in below grade manholes are undersized in their current capacity rating, have malfunctioned and present a hazard to operational personnel. The manufacturer has issued a hazard warning letter (G&W dated 7/10/85) to all Users on the hazard present to personnel and equipment on operating these switches under any load condition.
- c. The building high-voltage underground service cable laterals and Inner Circle main cable loop feeders B1, B2, B3 and B4 are direct burial, over 30 years of age and have passed the end of the predicted useful life, as recommended by cable manufacturers of Cross-Linked Polyethylene Cables.
- d. A Central Control and Monitoring Station is necessary to permit fast control of the Site Distribution System from a central point where all necessary parameters would be available and for quick system analysis when problems occur. Disturbances on the distribution system have caused repeated untimely interruptions and loss of experimental data. A Central Control and Monitoring Station will quickly identify the trouble so that corrective action can be taken to minimize downtime.



PROJECT DATA SHEETS

1. Title and location of project:	Electrical System Upgrade - Phase II Argonne National Laboratory Argonne, Illinois	2. Project No. 93-E-313
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11. Method of Performance

Engineering and design will be performed under a negotiated A/E contract with guidance, review and monitoring by Laboratory personnel. Inspection will be performed by Laboratory personnel aided by the A/E firm. Construction management and project management will be performed by Laboratory personnel. Construction will be accomplished by fixed-price lump sum contract(s) awarded on the basis of competitive bidding.

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

	Prior Years	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	Total
a. Total project costs (TPC)								
1. Total project costs								
(a) Construction line item (TECC).....	\$ 0	\$ 0	\$ 0	\$ 750	\$1,700	\$1,375	\$1,275	\$5,100
Total direct costs .....	\$ 0	\$ 0	\$ 0	\$ 750	\$1,700	\$1,375	\$1,275	\$5,100
2. Other project costs								
(a) Conceptual design costs.....	\$ 125	\$ 25	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 150
(b) Documentation costs.....	6	3	0	0	0	0	0	9
Total other project costs.....	\$ 131	\$ 28	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 159
Total project costs (Items 1 & 2).....	\$ 131	\$ 28	\$ 0	\$ 750	\$1,700	\$1,375	\$1,275	\$5,259
b. Total related annual costs (estimated life of project: 30 years)								
None.								

PROJECT DATA SHEETS

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1. Title and location of project:	Electrical System Upgrade - Phase II Argonne National Laboratory Argonne, Illinois	2. Project No. 93-E-313
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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project costs (TPC)

1. Total project costs

(a) Construction line item (TECC) - No narrative required.

2. Other project costs

(a) Conceptual design costs are for Conceptual Design Reports.

(b) Documentation costs includes preparation of project data sheets, design criteria and Environmental Evaluation Notification Form (DOE-CH 560).

b. Total related annual costs

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. Programmatic 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 programmatic effort in the facility - None.

4. Maintenance, repair, GPP or other construction related to programmatic effort - None.

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

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1. Title and Location of Project: Upgrade Laboratory Space Support Systems Argonne National Laboratory Argonne, Illinois	2. Project No.: 93-E-311
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3a. Date A-E work initiated, (Title I design start scheduled): 2nd Qtr FY 1993 3b. A-E work (Title I & II) duration: 11 months 4a. Date physical construction starts: 3rd Quarter FY 1994 4b. Date construction ends: 4th Quarter FY 1995	5. Previous construction cost estimate: None  6. Current construction cost estimate: \$6,330 TECC: \$6,330 TPC: \$6,465 Date: January 1992
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<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1993	3,080	3,080	770
	1994	2,220	2,220	2,385
	1995	1,030	1,030	1,600
	1996	0	0	1,575

PROJECT DATA SHEETS

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|---|--------------------------|
| 1. Title and Location of Project: Upgrade Laboratory Space<br>Support Systems<br>Argonne National Laboratory<br>Argonne, Illinois | 2. Project No.: 93-E-311 |
|---|--------------------------|
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8. Brief Physical Description of Project

This project will provide the most urgently needed rehabilitation of laboratory space support systems that are no longer adequate, reliable, efficient or in accordance with health safety standards as follows: replacement of air compressor systems in Bldgs. 202, 203, 205 and 212 (including compressors, dryers, after-coolers, moisture separators, filters, air-receiver tanks and controls); replacement of steam-turbine emergency-generators, with new diesel emergency generators in Bldgs. 200, 203, 212, 315, 362 and 375 (including remote radiators, prefabricated metal or masonry wall enclosures, diesel oil storage tanks, day tanks, batteries, switches and wiring); replacement of an antiquated diesel emergency generator with a new diesel generator in Bldg. 205 (including prefabricated metal enclosure, diesel oil storage tank, day tank, transfer switch and wiring); and renovation of electrical switchgear in Bldgs. 202, 203, 205 and 301 (including replacement of air circuit breakers and reconditioning of bus bar connection points).

9. Purpose, Justification of Need and Scope of Project

Air Compressor Systems

These critical systems provide 100 pounds per square inch guage compressed air to pneumatic controls and to laboratories for research instruments, cleaning, fume hoods, and other pneumatic equipment. The systems are generally 30 to 40 years old and have many moving parts that have nearly worn out and need frequent replacement. Some parts, such as reed-type valve seats, are no longer used in newer model compressors and can take 3 to 6 months for delivery. Most other replacement parts are also difficult to obtain and require near rebuilding of the compressors.

Feather valves, which function as a spring and resealing element have cycled (open-close) beyond their design ratings. The hour-glass-like wear pattern of the cylinders creates excessive wear on the head-end and mis-alignment of the cylinders and piston rods, which causes overheating. Blow-by becomes excessive which results in loss of air capacity and increased discharge temperature. Lowered response characteristics and control difficulties have occurred due to buildup of gum and contaminants at orifices and valves. Accumulation of compressor contaminants and solids has increased and cannot be removed by filters. Condensation and

PROJECT DATA SHEETS

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1. Title and Location of Project: Upgrade Laboratory Space Support Systems Argonne National Laboratory Argonne, Illinois	2. Project No.: 93-E-311
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9. Purpose, Justification of Need and Scope of Project (Continued)

contaminant buildup becomes a by-product which can damage automatic controls and expensive laboratory instruments. There are frequent oil leaks which result in friction wear.

The frequency and duration of general maintenance has continued to increase beyond normal expectations, which results in longer than desired operation of stand-by units, greater probability of failure, increased parts and labor costs, and increased potential for negative impact on scientific programs.

Emergency Generators

The existing emergency generators provide the critical back-up electrical power when there is an interruption or failure of the normal power source or feeders provided by the utility company. The generators provide power to pumps, critical air exhaust fans, selected distribution panels for laboratory instruments, and emergency lighting. In many cases, their capacity and operational functions are critical toward protecting the indoor and outdoor environments and the general safety of personnel, and preventing the loss of vital data from long-term scientific experiments. The existing generators, with the exception of the diesel generator in Bldg. 205, are steam driven turbine systems, which totally rely on steam pressures of 180 to 200 lbs to reach their original design capacity.

Recent load tests on these generators revealed, that at the maximum supplied steam pressures, the generators were providing only 60 to 80% of their rated capacity. It is logical to presume, from experience, that this age-related degradation of capacity will continue until the generators are no longer capable of serving their connected loads.

In addition, the capacity of the generators is directly dependent on the ability of the existing steam distribution system to maintain adequate steam pressure and flow, an ability that could be compromised by component failure or by damage to the boiler house and/or steam distribution piping caused by disasters such as tornadoes.

Lastly, these steam driven turbine generators are not in compliance with the National Electrical Code (NEC - Article 700) nor the National Fire Protection Association (NFPA 10) which require that Level-1 emergency power supply systems (EPS) shall be provided with an on-premise fuel supply and will not be dependent on

PROJECT DATA SHEETS

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1. Title and Location of Project: Upgrade Laboratory Space Support Systems Argonne National Laboratory Argonne, Illinois	2. Project No.: 93-E-311
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9. Purpose, Justification of Need and Scope of Project (Continued)

other sources of fuel supply. Level-1 which refers to applications that protect against loss of human life or serious injury, further requires that emergency power supply systems shall be located in separate and dedicated two-hour fire-rated interior enclosures or non-combustible sheltered exterior enclosures. None of the existing steam turbines or the one diesel generator (Bldg. 205) fulfill these requirements.

Electrical Switchgear

The main electrical indoor substation switchgear equipment was manufactured prior to 1950 (they had been used by the armed services before installation at Argonne). Electrical switchgear contains several circuit breakers which are switching devices designed to open a current-carrying circuit under abnormal current conditions. The safety of all electrical installations depends heavily upon the function of protective devices like the circuit breaker (or fuse) to disconnect the source of supply from any portion of a system which has experienced a fault (short circuit).

Because of the nature of its function, a circuit breaker is subjected to many stresses which are not normally present in other electrical equipment. Those stresses are thermal, electrical, magnetic and structural. The contact surfaces of any switching mechanism are subject to deterioration such as crystallization due to the heating and pitting caused by magnetic stresses which tend constantly to cause vibration between those surfaces. Since the circuit breaker itself is a source of heat (especially in larger units such as those in this project), insulating materials incorporated in their designs are also subject to a more rapid degree of deterioration.

Circuit breakers operate under conditions of structural stress, that is, they are normally held closed against a force which constantly attempts to open them. The force is restrained by mechanical means such as a latch, which in turn is released through the actions of delicate devices (bimetallic thermal elements, solenoids or a combination thereof) with instrument-like precision. As a result of heating upon all of these elements, their characteristics are subject to changes resulting in decay of spring tensions, deviations in bimetallic responses, derangement of sensing elements, loss of calibration and, thus, a generally ineffective circuit breaker.

PROJECT DATA SHEETS

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1. Title and Location of Project: Upgrade Laboratory Space Support Systems Argonne National Laboratory Argonne, Illinois	2. Project No.: 93-E-311
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9. Purpose, Justification of Need and Scope of Project (Continued)

Because of these functional characteristics and regardless of whether a circuit breaker is called upon to operate under short circuit conditions, it must constantly be maintained in proper operating condition. This requires the replacement of worn or deteriorated parts, resulting in increased maintenance costs.

When a circuit breaker is called upon to stop the flow of very large short circuit currents, it is subjected to stresses which exceed those normal stresses described above by as much as 400 times. After such a violent operation, and although properly applied breakers are supposed to withstand those stresses, any circuit breaker must be suspect of possible serious damage. Upon examination, it is normally found that various components must be replaced.

After a certain number of years, the useful life of the circuit breaker is considered expended. At that time, spare parts are often no longer available, or deterioration has progressed to the point where dependable repair can no longer be effected.

Alternatives to the Proposed Action

There appear to be two alternatives other than the proposed rehabilitation project: (1) take no action, and (2) make only minimal repairs and rehabilitate only progressively when absolutely necessary.

No Action Alternative 1

This approach would allow the adverse environmental, fire, safety and health conditions and the inefficient mechanical and electrical systems to continue in their present state. The frequency and duration of partial or total, functional shutdowns and the negative impact on productivity of scientific work, some of which is time-sensitive would increase. Yearly maintenance costs would also increase and be subject to inflationary pressures as well. Finally, morale would be impaired. This approach is not recommended.

PROJECT DATA SHEETS

1. Title and Location of Project: Upgrade Laboratory Space Support Systems  
Argonne National Laboratory  
Argonne, Illinois

2. Project No.: 93-E-311

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

Minimum and Progressive Rehabilitation Alternative 2

This is the option now in use. It is an expensive approach over a long duration of time and allows various adverse environmental fire, safety, and health conditions, inefficient physical plant systems and periodic scientific shutdowns to continue until rehabilitation occurs at some future time. The repairs are expensive and represent a "band-aid" approach as some working mechanical and electrical parts are not now available for the existing systems and equipment. The unreliability of aged and worn components compounds the problems. Importantly, the piecemeal rectification approach over a long period of time for each item in this report increases the number of times that an entire wing must be shut down for repairs. This approach is not recommended.

The recommended approach to expediently solve the described problems is to perform the rehabilitation and replacement work as discussed in this proposal.

10. Details of Cost Estimate a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ approximately 12% of construction costs, item b.....		\$ 570
b. Construction management @ approximately 3% of construction costs, item b.....		140
c. Project management @ approximately 2% of constructions costs, item b.....		90
d. Construction costs.....		4,710
(1) Air compressors.....	\$1,010	
(2) Emergency generators.....	2,450	
(3) Switchgear.....	1,250	
Subtotal.....		<u>\$5,510</u>
e. Contingency @ approximately 15% of above costs.....		<u>820</u>
Total estimated construction cost (TECC).....		<u>\$6,330</u>

a/ The above estimates are based upon a completed conceptual design and current cost data. All costs have been escalated from January 1991 to the midpoint of construction. Escalation rate is based upon DOE FY 1992 Guidance dated August 1990: FY 1991 - 3.6%, FY 1992 - 3.5%, FY 1993 - 4.0%, FY 1994 - 4.5%, and FY 1995 - 4.9%.

PROJECT DATA SHEETS

1. Title and Location of Project:	Upgrade Laboratory Space Support Systems Argonne National Laboratory Argonne, Illinois	2. Project No.: 93-E-311
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11. Method of Performance

Engineering and design will be performed under a negotiated A/E contract with guidance, review and monitoring by Laboratory personnel. Inspection will be performed by Laboratory personnel aided by the A/E firm. Construction management and project management will be performed by Laboratory personnel. Construction will be accomplished by fixed-price lump sum contract(s) awarded on the basis of competitive bidding.

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

	Prior Years	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	Total
a. Total project costs (TPC)								
1. Total project costs								
(a) Construction line item.....	\$ 0	\$ 0	\$ 0	\$ 770	\$2,385	\$1,600	\$ 1,575	\$ 6,330
Total direct costs.....	\$ 0	\$ 0	\$ 0	\$ 770	\$2,385	\$1,600	\$ 1,575	\$ 6,330
2. Other project costs								
(a) Conceptual design costs.....	\$80	\$ 40	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 120
(b) Documentation costs.....	10	5	0	0	0	0	0	15
Total other project costs.	\$90	\$ 45	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 135
Total project costs (items 1 & 2)....	\$90	\$ 45	\$ 0	\$ 770	\$2,385	\$1,600	\$ 1,575	\$ 6,465

b. Total related annual costs  
None.

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
  2. Other project funding
    - (a) Conceptual design costs are for Conceptual Design Reports.
    - (b) Documentation costs include preparation of project data sheets, design reviews, and Environmental Evaluation Notification Form (DOE - CH560).

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FY 1993 CONGRESSIONAL BUDGET REQUEST  
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ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Upgrade of Site Mechanical Utilities Phase II - Sewer Monitoring Lawrence Berkeley Laboratory Berkeley, California	2. Project No.: 93-E-310
3a. Date A-E work initiated (Title I design start scheduled): 2nd Qtr FY 1993  3b. A-E work (Titles I & II) duration: 15 months  4a. Date physical construction starts: 3rd Qtr FY 1993  4b. Date construction ends: 3rd Qtr FY 1996	5. Previous construction cost estimate: None   6. Current construction cost estimate: \$7,100 TECC: \$7,100 TPC: \$7,150 Date: January 1992

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u> a/	<u>Obligations</u>	<u>Costs</u>
	1993	\$ 800	\$ 800	\$ 200
	1994	3,350	3,350	1,775
	1995	2,950	2,950	3,075
	1996	0	0	2,050

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

## PROJECT DATA SHEETS

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1. Title and location of project: Upgrade of Site Mechanical Utilities, Phase II - Sewer Monitoring Lawrence Berkeley Laboratory Berkeley, California	2. Project No.: 93-E-310
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### 8. Brief Physical Description of Project

This project includes the following items of construction:

- o East Canyon Utility Center
- o East Canyon Sanitary Sewer Modifications
- o East and West Canyon Sanitary Sewer Monitoring Facilities
- o Miscellaneous Site Utilities

An East Canyon Utility Center will be constructed in the Building 74/83 Area. It will provide cooling water and compressed air to the Building 74/83 Area and compressed air to other building areas in the East Canyon. It will be of modular design with space reserved to allow expansion of cooling water systems for future building projects in Building 74/83 Area.

The East Canyon sanitary sewer system will be modified to separate Lawrence Berkeley Laboratory (LBL) sanitary waste from that of UC Berkeley and gather all LBL sanitary waste into one outfall.

New waste monitoring facilities will be constructed at the West Canyon and East Canyon sanitary sewer outfalls.

Cathodic corrosion protection for buried cooling water and compressed air lines will be installed; a storm drain system for Building 52 will be constructed; and buried tanks will be removed and replaced with tanks of double wall construction with leak monitoring.

These improvements to existing government-owned facilities will be located on land owned by the University of California and will serve or be operated in conjunction with other government-owned facilities at LBL.

## PROJECT DATA SHEETS

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1. Title and location of project: Upgrade of Site Mechanical Utilities, Phase II - Sewer Monitoring Lawrence Berkeley Laboratory Berkeley, California	2. Project No.: 93-E-310
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### 9. Purpose, Justification of Need and Scope of Project

The East Canyon Utility Center and Central Cooling System are needed in order to remove two aged and obsolete cooling towers from the roof of Building 74, allow expanded cooling in the building, provide a central cooling system (of modular design to facilitate future expansion in keeping with the long-range site plan) and provide a central compressed air facility in the East Canyon Area.

The East Canyon Sanitary Sewer Modifications are needed because new state and local environmental regulations require LBL sanitary sewer discharges to be monitored for more hazardous materials than is possible with existing facilities. LBL has two existing monitoring stations. One of them serves the West Canyon portion of the system and the other serves the East Canyon, including UC Berkeley buildings. A total of six monitoring facilities would be required to monitor all LBL sewer outfalls separate from those of UC Berkeley. Modification of the system will allow monitoring to be accomplished with two monitoring stations (one at each of two outfalls) instead of six. The construction costs for four additional monitoring facilities would greatly exceed the cost of system modifications incorporated in this project. In addition, much greater operating costs would be required to operate four additional facilities.

The East and West Canyon Sanitary Sewer Monitoring Facilities are needed because the West Canyon monitoring station is substandard and it is not feasible to upgrade it to current standards. The East Canyon monitoring system is also substandard, located outside of LBL boundaries and remote from the location of the proposed East Canyon single outfall. Both of the existing monitoring stations must be replaced and removed.

Miscellaneous Site Utilities are needed because:

Recent experience at LBL and recommendations from corrosion consultants indicate a need for cathodic corrosion protection of buried cooling water and compressed air lines similar to the system that has just been installed for the natural gas distribution system.

Construction of an improved storm drain system of Building 52 will correct a serious drainage ponding problem with interferes with building operations.

PROJECT DATA SHEETS

<p>1. Title and location of project: Upgrade of Site Mechanical Utilities, Phase II - Sewer Monitoring Lawrence Berkeley Laboratory Berkeley, California</p>	<p>2. Project No.: 93-E-310</p>
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9. Purpose, Justification of Need and Scope of Project (Continued)

Current environmental regulations require that buried tanks containing hazardous materials be of double-wall construction with leak monitoring. Investigations have identified several single-wall tanks that must be removed or replaced.

<u>10. Details of Cost Estimate a/</u>	<u>Item Costs</u>	<u>Total Cost</u>
a. (1) Engineering, design, and inspection at approximately 18% of construction costs, Item b.1.....		\$ 900
(2) Construction management at approximately 2% of construction costs....		100
b. Construction costs.....		5,130
(1) Utilities.....	4,980	
(2) Project Management (3% of Construction costs, Item b1).....	150	
Subtotal.....		<u>6,130</u>
c. Contingency at approximately 16% of above costs.....		<u>970</u>
Total estimated construction cost (TECC).....		<u>\$ 7,100</u>

a/ Costs have been escalated at, 3.1% for FY 1990, 3.6% for FY 1991, 3.5% for FY 1992, 4.0% for FY 1993, 4.5% for FY 1994, and 4.9% for FY 1995; compounded to the midpoint of construction, August 1995.

Conceptual design is complete.  
PED requirements: None.

11. Method of Performance

Design will be accomplished on basis of a negotiated architect-engineer contract. Construction and procurement will be accomplished by fixed price contracts awarded on basis of competitive bidding.

PROJECT DATA SHEETS

1. Title and location of project: Upgrade of Site Mechanical Utilities, Phase II - Sewer Monitoring Lawrence Berkeley Laboratory Berkeley, California	2. Project No.: 93-E-310
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12. Funding Schedule of Project Funding and Other Related Funding Requirements

	<u>Prior Yrs</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>Total</u>
a. Total project costs (TPC)						
(1) Total facility costs						
(a) Construction line item (TECC)	\$ 0	\$ 200	\$ 1,775	\$ 3,075	\$ 2,050	\$ 7,100
Total direct costs.....	\$ 0	\$ 200	\$ 1,775	\$ 3,075	\$ 2,050	\$ 7,100
(2) Other project costs						
(a) Conceptual design costs.....	\$ 50	\$ 0	\$ 0	\$ 0	\$ 0	\$ 50
Total other project related costs	\$ 50	\$ 0	\$ 0	\$ 0	\$ 0	\$ 50
Total project costs (Items 1 and 2)...	<u>\$ 50</u>	<u>\$ 200</u>	<u>\$ 1,775</u>	<u>\$ 3,075</u>	<u>\$ 2,050</u>	<u>\$ 7,150</u>
b. Other related annual costs						
None.						

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.
- (2) Other project costs
- (a) Conceptual design costs: Includes costs for preparation of conceptual design report (CDR) by consultants and LBL personnel.
- b. Other Related Annual Costs
- None

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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 Substation Upgrade Argonne National Laboratory (ANL) Argonne, IL	2. Project No. 92-E-329
3a. Date A/E work initiated, (Title I design start scheduled): 2nd Qtr. FY 1992	5. Previous construction cost estimate: None
3b. A/E work (Title I & II) duration: 14 months	6. Current construction cost estimate: \$4,970 TECC: \$4,970 Date: January 1992
4a. Date physical construction starts: 3rd Quarter FY 1993	
4b. Date construction ends: 4th Quarter FY 1994	

<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1992	\$ 500	\$ 500	\$ 400
	1993	4,470	4,470	3,200
	1994	0	0	1,370

PROJECT DATA SHEETS

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1. Title and location of project: Electrical Substation Upgrade  
Argonne National Laboratory (ANL)  
Argonne, IL

2. Project No. 92-E-329

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8. Brief Physical Description of Project

The project provides for the upgrade of the main electrical substation at Facility 549. The work consists of the following elements:

- a) Increase the substation fenced area at 549B (west) by 13,400 sq. ft.
- b) Install two 25 MVA transformers (T7 & T8).
- c) Install associated primary and secondary protective devices (circuit breakers).
- d) Install a steel tower under existing 138 KV line to accommodate new transformer high voltage service connections.
- e) Install concrete oil containment basin under new and existing transformers.
- f) Extend existing lighting and ground grid systems.

9. Purpose, Justification of Need and Scope of Project

The existing electrical system at Facility 549 has the capacity to service existing programmatic experiments and utilities. The system's reliability is questionable. The present load conditions are such that any transformer failure would result in the remaining transformers assuming a proportionate load and going into fan cooling capacity for a prolonged period of time until transformer repairs (6 to 9 months) or transformer replacement (12 months or longer) could be made. During this period of time it might be necessary to cut back on scientific program loads. Due to the age of the existing transformers it's questionable as to how long they will hold up while operating in an overload condition for a long period of time.

PROJECT DATA SHEETS

1. Title and location of project: Electrical Substation Upgrade  
 Argonne National Laboratory  
 Argonne, IL

2. Project No. 92-E-329

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

Additional transformers at Facility 549 would give the laboratory the needed reserve capacity and allow segregation and isolation of those research programs that are sensitive to line fluctuations created by other users. Oil containment basins for all transformers (existing and new) will be provided in accordance with Federal Environmental Protection Agency regulations on oil pollution prevention.

If this project is not approved and the existing distribution system at Facility 549 remains as is, the present and future known load conditions would have to be serviced from existing transformers and would not allow further expansion of 13.2 Kv power within the base ratings of the existing transformers.

10. Details of Cost Estimates a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. (1) Engineering, design and inspection at approximately 12% of construction costs.....		\$ 440
(2) Construction management at 3% of construction costs.....		110
(3) Project management at 2% of construction costs.....		70
b. Construction Cost.....		3,700
(1) Site work.....	\$ 300	
(2) Transformers.....	1,400	
(3) High Voltage Protection Switches.....	1,200	
(4) Electrical Installations.....	700	
(5) General Conditions.....	100	
Subtotal.....		\$ 4,320
c. Contingency at approximately 15% of above costs.....		650
Total estimated construction cost (TECC).....		\$ 4,970 <u>b/</u>

a/ The above estimates are based on a completed conceptual design and current costs data.

b/ All costs have been escalated from January 1990 to the midpoint of construction. Escalation rate methodology was based upon DOE FY 1990 guidance dated August 1989; FY 1990 - 2.9%, FY 1991- 3.6%, FY 1992 - 3.5%, FY 1993 - 4.0%, and FY 1994 - 4.5%.

PROJECT DATA SHEETS

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1. Title and location of project: Electrical Substation Upgrade Argonne National Laboratory (ANL) Argonne, IL	2. Project No. 92-E-329
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11. Method of Performance

Engineering and design will be performed under a negotiated A/E contract with guidance, review and monitoring by Laboratory personnel. Inspection will be performed by Laboratory personnel aided by the A/E firm. Construction management and project management will be performed by Laboratory personnel. Construction will be accomplished by fixed-price lump sum contract(s) 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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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: Technical and Administrative Services Facility  
 Ames Laboratory  
 Ames, Iowa

2. Project No.: 92-E-328

3a. Date A-E work initiated (Title I design start scheduled): 3rd Qtr FY 1991

3b. A-E work (Titles I & II) duration: 6 months

4a. Date physical construction starts: 1st Qtr FY 1992

4b. Date construction ends: 4th Qtr FY 1993

5. Previous construction cost estimate: None

6. Current construction cost estimate: \$ 6,040<sup>a/</sup>  
 TECC: \$ 6,040  
 Date: January 1992

<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1991	\$ 0 <sup>a/</sup>	\$ 0 <sup>a/</sup>	\$ 0
	1992	1,500	1,500	400
	1993	1,557	1,557	1,800
	1994	0	0	857

8. Brief Physical Description of Project

This project is a four-story building which will house the programmatic support activities and the central administrative offices of the Ames Laboratory. The building is to be constructed between Spedding Hall, a research laboratory building, and the Chemistry building of Iowa State University. This building will be attached to Spedding Hall and is located on land currently leased to the Federal Government by the State of Iowa under a long term agreement.

<sup>a/</sup> \$2,982,600 provided by Congress in Basic Energy Sciences program to initiate construction of this facility. These funds are part of the current cost estimate.

PROJECT DATA SHEETS

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1. Title and location of project: Technical and Administrative Services Facility Ames Laboratory Ames, Iowa	2. Project No.: 92-E-328
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8. Brief Physical Description of Project (Continued)

The site chosen for this facility is presently a grassed area and loading dock with driveway. No roadway construction is required by this project. Site preparation will require the removal of the loading dock and approach ramp. The present elevation will require cut and fill to provide a final building site.

The building will be a four-story structure, with space designated separately in a partial basement or penthouse for mechanical equipment. The floor area will be approximately 9,350 square feet per story for a total enclosed gross area of 37,400 square feet. Story height will match the existing floor elevations of Spedding Hall. The structure will be steel and masonry, with a brick facia exterior to match the existing building. Utilities will be provided from the basement of Spedding Hall from the transformer in that substation and extension of plumbing already existing in that basement. Standard utilities to be provided include water, sewer, electric power, chilled water, steam and condensate returns for heating, and communication lines. Standard equipment to be provided include fixed items such as fire detection equipment and window treatments. Furniture is included for all areas where required by the configuration or the special use areas such as conference rooms and computer terminal areas. Individual office furniture will be relocated from existing spaces.

Special equipment required for this project includes a building and Ames Laboratory directory in the lobby space, with display cases for highlighting activities of Ames Laboratory. Relocation of the administrative services computer group into this space will require a computer room with adequate air conditioning and security for the associated business systems computer equipment.

9. Purpose, Justification of Need and Scope of Project

The purpose of this project is to provide space for programmatic support services required within Ames Laboratory. These programmatic support services include environmental, safety, and health services; administrative support services and automatic data processing facilities; graphics and printing services; and laboratory management.

Environmental and safety services are increasing at a rapid pace as required by DOE orders and regulations. Full compliance with the Occupational Safety and Health Act (OSHA) is required by DOE, and new sections recently added to OSHA impact the laboratory by requiring additional staff, space and facilities to meet these requirements. Additional training for all staff is also required which demands more space and facilities to meet those needs.

PROJECT DATA SHEETS

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| 1. Title and location of project: Technical and Administrative Services<br>Facility<br>Ames Laboratory<br>Ames, Iowa | 2. Project No.: 92-E-328 |
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9. Purpose, Justification of Need and Scope of Project (Continued)

Environmental activities required to conform to the Environmental Policy Act (EPA) are significantly increased. Waste minimization and tracking efforts are required within Ames Laboratory and this in turn requires additional space and facilities. Efforts to minimize waste, track chemicals and other waste, recycle materials, and to provide training in these activities are currently being implemented.

The DOE posture is shifting from reactive to proactive safety, environmental and health activities. This includes industrial and chemical hygiene activities which need expansion at Ames Laboratory. The Occupational Medicine program at Ames is currently located in space that is absolutely inadequate for its mission. A recent appraisal of the occupational medicine program at the Ames Laboratory by the Department of Energy highlights this deficiency. Recommendation three of the appraisal report states "...that additional space [should] be promptly found for the medical department." The discussion describes the current area as "grossly deficient" and further states, "Space is so short that no privacy for patients can be assured and the physician's efficiency for seeing patients is seriously compromised." The existing facility also lacks sufficient amenities for its function. Specifically, it lacks dedicated toilet rooms, laboratory space, examination rooms, and consultation space. Furthermore, access is not convenient for patients, the handicapped or ambulance service. The new construction will provide the space and facilities required for the group to effectively carry out its mission.

The administrative support services include the functions of accounting, budgeting, procurement, property management, personnel, graphics and printing, and data systems. The personnel providing these services are located in a building designed for research facilities and, such usage of facilities does not represent efficient use of research space. The interior construction of these present facilities is composed of high ceilings, ceramic tile type walls, and long and narrow floor plans which do not contribute to a business environment and divide administrative functions which should be co-located. Additionally, each research bay has individual utilities and environmental control standards not required for administrative activities. Maximum utilization can be achieved from these facilities only when they are occupied and used by research organizations, the purpose for which they were constructed.

Presently, administrative computer facilities are located in a renovated vehicle garage, built in 1950, which is remotely located from the organizational elements these facilities support. The scientific computer facilities are located in other laboratory areas and rented space. The movement of these

PROJECT DATA SHEETS

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1. Title and location of project: Technical and Administrative Services Facility Ames Laboratory Ames, Iowa	2. Project No.: 92-E-328
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9. Purpose, Justification of Need and Scope of Project (Continued)

facilities to the new structure will allow Ames Laboratory to satisfy both ADP environmental and ADP security requirements while becoming readily accessible to those primary users of the system which includes top management personnel, administrative staff and operations and facilities organizational elements. The 40-year-old renovated vehicle garage is located over an area that had an underground fuel oil tank leak in 1970-71.

Remediation of that problem by removal of the fuel-oil contaminated soil will require demolition of the old building. The State of Iowa has agreed to delay this remediation work only for several years to allow acquisition of replacement space for the computer facilities.

Ames Laboratory management is currently located in offices rented from Iowa State University which are remotely located (two buildings and a parking lot away) from the majority of other organizational elements of the Ames Laboratory, such as the offices of budget, personnel and accounting. Thus, the offices of the director, deputy directors and associate directors are inconveniently accessed by those who require frequent interaction. A single, moderately sized conference room is available to the directors on a shared basis with a variety of university functions, thus making scheduling of meetings difficult at best as the Laboratory has no priority in the scheduling of this room. Indeed, the Ames Laboratory has no control over assignment of space in the rented space and has experienced a steady decrease in functions at Ames Laboratory to provide a central and identifiable location for efficient administration and management.

Existing facilities have been reviewed in order to determine if economical modifications could be accomplished in order to satisfy the stated space requirements. As stated earlier, the existing facilities were designed to maximize research, and both utilities and environmental controls are oriented towards these efforts. Thus, the only conclusion is that these existing facilities should be returned to their original purpose and would not be modified easily or economically for continued use by administrative personnel. The need for research laboratory space is continuing in Ames Laboratory and the relocation of the administrative offices which provide the programmatic support services will provide such laboratory space at less cost than new construction. Reduction of rented space also has a positive impact on the operating budget.

PROJECT DATA SHEETS

1. Title and location of project: Technical and Administrative Services Facility  
 Ames Laboratory  
 Ames, Iowa

2. Project No.: 92-E-328

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

By meeting the proposed completion date, Ames Laboratory will achieve two major benefits. Research facilities will be returned to their original intended purpose which means additional research facilities will be available at the lowest possible cost and the management and administrative functions of the laboratory will be centralized in a structure designed for business operations. This will provide cohesiveness and organizational unity for subunits while achieving a one-stop administrative area for the support of scientific programs. The completion of the facility will also allow prompt remediation of the fuel-oil contamination at the computer garage site and will provide adequate space for the increasing level of activities in environmental, health and safety programs.

10. Details of Cost Estimate <sup>a/</sup>

	<u>Item Costs</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ approximately 14% of construction costs, item b.....		\$ 627
b. Construction.....		4,645
(1) Improvements to Land.....	\$ 25	
(2) Building.....	4,620	
(a) Structural & Architectural.....	3,115	
(b) Mechanical/Electrical (Incl. Outside Util.)....	1,425	
(c) Telecommunication.....	80	
c. Equipment and Furnishings.....		68
(1) Fixed Equipment.....	48	
(2) Special Equipment (Conf. Room).....	20	
Subtotal.....		<u>\$5,340</u>
d. Contingency at approximately 13% of above costs.....		<u>700</u>
Total Estimated cost.....		<u>\$6,040</u>

a/ Cost estimate is based on a conceptual design completed in 1990. Escalation Rate Used: General Construction Index = 1.15 for midpoint of construction in 1993.

11. Method of Performance

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

PROJECT DATA SHEETS

1. Title and location of project: Technical and Administrative Services Facility Ames Laboratory Ames, Iowa	2. Project No.: 92-E-328
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12. Funding Schedule of Project Funding and Other Related Funding Requirements

	<u>Prior Years</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>Total</u>
a. Total project costs (TPC)				
(1) Total facility costs				
(a) Construcion line item.....	\$ 3,825	\$ 1,590	\$ 0	\$ 5,415
(b) Engineering, design & inspection costs.....	\$ 575	\$ 50	\$ 0	\$ 625
Total direct costs.....	\$ 4,400	\$ 1,640	\$ 0	\$ 6,040
(2) Other project costs				
(a) Conceptual design costs.....	\$ 25	\$ 0	\$ 0	\$ 25
Total other project costs.....	\$ 25	\$ 0	\$ 0	\$ 25
Total Project Costs (items 1 & 2).....	\$ 4,425	\$ 1,640	\$ 0	\$ 6,065
b. Other Related Annual Costs (Estimated Life: 35 Years)				
(1) Facility operating costs.....				\$ 80
(2) Programmatic operating expenses directly related to the facility (overhead services).....				2,700
(3) Capital equipment not related to construction but related to the programmatic effort.....				40
(4) Maintenance, repair, GPP or other construction related to the programmatic effort.....				50
Total related annual costs.....				\$ 2,870

PROJECT DATA SHEETS

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- |  |                          |
|--|--------------------------|
| 1. Title and location of project: Technical and Administrative Services<br>Facility<br>Ames Laboratory<br>Ames, Iowa | 2. Project No.: 92-E-328 |
|--|--------------------------|
- 

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

- a. Total Project Costs
  - (1) Total facility cost estimate in Item 10 based on completed conceptual design report.
  - (2) Other project costs
    - (a) Conceptual design performed in FY 1991 at a cost of \$25,000.
  
- b. Total related funding requirements - it is estimated the facility will be used 35 years for its programmatic purpose.
  - (1) Facility operating costs  
This cost is estimated on the basis of average operating cost per square foot for all other space in Ames Laboratory.
  - (2) Programmatic operating costs  
This cost is based on the staff utilizing this facility at an average cost per man-year in Ames Laboratory. This staff is providing services supported by overhead funds.
  - (3) Capital equipment costs  
This cost is the continuing general purpose equipment cost for use by the staff in 2.
  - (4) Maintenance and repair costs  
This cost is based on the average cost per square foot for all other space in Ames Laboratory.

DEPARTMENT OF ENERGY  
FY 1993 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: Safety Compliance Modifications, 326 Building  
 Pacific Northwest Laboratory  
 Richland, Washington

2. Project No. 92-E-324

3a. Date A-E work initiated (Title I design start scheduled): 2nd Qtr. FY 1992

3b. A-E work (Title I & II) duration: 11 months

4a. Date physical construction starts: 2nd Qtr. FY 1993

4b. Date construction ends: 1st Qtr. FY 1994

5. Previous construction cost estimate: None

6. Current construction cost estimate: \$ 8,400  
 TECC: \$ 8,400  
 TPC: \$ 8,520  
 Date: January 1992

<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1992	\$ 1,700	\$ 1,700	\$ 400
	1993	6,000	6,000	3,054
	1994	700	700	3,746
	1995	0	0	1,200

## PROJECT DATA SHEETS

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1. Title and location of project: Safety Compliance Modifications, 326 Building  
Pacific Northwest Laboratory (PNL)  
Richland, Washington
2. Project No. 92-E-324
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### 8. Brief Physical Description of Project

This project will bring the 326 Building, which is an aged but strategically important laboratory, into compliance with DOE Order 6430.1A, National Fire Protection Association (NFPA) Requirements, National Electric Code Requirements, and State of Washington Requirements.

This project will include the following modifications to 326 Building:

Clearly define the egress pathways from the facility to meet the intent of NFPA 101, provide fire resistant stairwells and exit corridors to meet the intent of NFPA 101, extensive upgrading of the building electrical system to comply with The National Electric Code including replacement of most of the electrical distribution system, installation of a new motor control center, installation of backflow prevention on the fire main to meet State of Washington requirements, installation of handicap facilities, installation of full wet pipe sprinklers to comply with NFPA Requirements, and other modifications to meet code requirements.

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

The purpose of this project is to ensure continuity of operations in a vital laboratory facility supporting energy research operations. The 326 Building figures prominently in PNL's research in structural and microstructural materials research, microstructural services, chemical methods and separations, component analysis, super critical fluids, super conducting materials and various other basic research programs.

PROJECT DATA SHEETS

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1. Title and location of project: Safety Compliance Modifications, 326 Building      2. Project No. 92-E-324  
Pacific Northwest Laboratory (PNL)  
Richland, Washington

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

Department of Energy Order 6430.1A requires facilities to comply with the requirements of NFPA 101, Life Safety Code. Modifications to the facility will upgrade egress pathways, stairwells, and exit corridors to meet the intent of NFPA 101. Department of Energy Order 6430.1A also requires facilities to comply with the provisions of NFPA 70, NEC. Some aspects of the existing power distribution system do not meet the requirements for clear access as described in the NEC. In addition, replacement parts are not readily available for panelboards. There are some panels that are at full capacity with some circuits being overloaded. Additional distribution panel will be installed to alleviate the condition.

Under agreement with the State of Washington, potable water systems at Hanford will be installed or modified to meet the requirements of the Washington State Department of Social and Health Services. At the 326 Building this effort will include installing backflow prevention devices on the building fire main to meet the intent of these requirements.

Department of Energy Order 6430.1A requires that any DOE facility whose intended use may result in the employment of physically handicapped persons be designed in accordance with the Uniform Federal Accessibility Standards in 41 CFR 101-19-6. Modifications will be completed to comply with this provision.

This project will renovate portions of the 326 Building to modify the existing egress from the building and upgrade the facility to meet the current requirements of DOE Order 6430.1A. Modifications will be done to the building's architectural, structural, piping, heating, ventilating, and air conditioning (HVAC), fire protection, and communication systems.

PROJECT DATA SHEETS

1. Title and location of project: Safety Compliance Modifications, 326 Building Pacific Northwest Laboratory (PNL) Richland, Washington 2. Project No. 92-E-324

10. Details of Cost Estimates a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. (1) Engineering, design and inspection at approximately 35% of construction costs, item b.....		\$ 1,700
(2) Construction management at 3% of construction costs, Item b..		130
b. Construction costs.....		4,770
(1) Building (building modification only).....	4,610	
(2) Utilities.....	60	
(3) Special facilities.....	100	
Subtotal b/.....		<u>\$ 6,600</u>
c. Contingency at approximately 27% of the above cost.....		1,800
Total estimated construction costs (TECC) c/		<u>\$ 8,400</u>

a/ Based on completed conceptual design.

b/ Engineering costs are higher than normal due to the complexity of this project which is entirely facility modification work. The project contingency was applied at an average of 27%, which is at the upper end of contingency guidelines, due to uncertainties and restraints involved in demolition in areas having asbestos, HVAC ductwork modifications, and electrical tie-ins.

c/ Includes escalation at the rates of 2.2 (FY 1990), 3.6 (FY 1991), 4.5 (FY 1992), and 5.1 (FY 1993) to midpoint of construction with rates based on the January 1990 Hanford Material and Labor Escalation Study.

11. Method of Performance

Design and inspection of the building modification work will be performed by the onsite architecture engineer. Construction and procurement will be accomplished by the onsite construction contractor.

PROJECT DATA SHEETS

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1. Title and location of project: Safety Compliance Modifications, 326 Building Pacific Northwest Laboratory (PNL) Richland, Washington

2. Project No. 92-E-324

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

a. Total project costs (TPC)	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>	<u>Total</u>
1. Total facility costs						
(a) Construction line item.....	\$ 0	\$ 400	\$3,054	\$3,746	\$1,200	\$8,400
Total.....	\$ 0	\$ 400	\$3,054	\$3,746	\$1,200	\$8,400
2. Other project costs						
(a) R&D necessary to complete construction.....	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
(b) Conceptual design costs.....	120	0	0	0	0	120
(c) Other project related costs... ..	0	0	0	0	0	0
Total project costs.....	\$ 120	\$ 0	\$ 0	\$ 0	\$ 0	\$ 120
Total project costs (Item 1&2)	\$ 120	\$ 400	\$3,054	\$3,746	\$1,200	\$8,520

PROJECT DATA SHEETS

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1. Title and location of project: Safety Compliance Modifications, 326 Building Pacific Northwest Laboratory (PNL) Richland, Washington	2. Project No. 92-E-324
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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 -- \$8,400,000
    - (b). PE&D -- None
    - (c). Inventories -- Inventories necessary to put the facility into use are estimated to cost -- \$0
  - 2. Other Project Funding
    - (a). R&D Necessary to Complete Construction -- Preconceptual design/engineering studies cost -- \$0
    - (b). Conceptual Design was completed in FY 1990 at a total cost of \$120,000
    - (c). Other Project Related Funding -- Project support and start-up are estimated to cost -- \$TBD
- b. Total related funding requirements
  - 1. Facility operating costs -- The major elements comprising the annual operating costs are operating and maintenance costs for upkeep of the building HVAC systems and equipment, janitorial costs, steam and electrical utility costs. These costs are estimated to be approximately \$715,000 annually.
  - 2. Programmatic Operating Expenses directly related to the facility -- None
  - 3. Capital Equipment not Related to Construction, but Related to Programmatic Effort in the Facility -- None
  - 4. Maintenance, Repair, GPP, or Other Construction Related to Programmatic Effort in the Facility -- None

DEPARTMENT OF ENERGY  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
PROJECT DATA SHEETS  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT CAPITAL AND 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 Steam Distribution System - West End  
 Oak Ridge National Laboratory  
 Oak Ridge, Tennessee

2. Project No.: 92-E-323

3a. Date A-E work initiated (Title I design start scheduled): 1st Qtr FY 1992

3b. A-E work (Title I & II) duration: 12 months

4a. Date physical construction starts: 1st Qtr FY 1993

4b. Date construction ends: 4th Qtr FY 1995

5. Previous construction cost estimate: \$5,500

6. Current construction cost estimate: \$9,000\*  
 TECC: \$9,000  
 TPC: \$9,130  
 Date: January 1992

<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1992	\$1,080	\$1,080	\$ 300
	1993	5,607	5,607	3,000
	1994	2,313	2,313	3,200
	1995	0	0	2,500

8. Brief Physical Description of Project

This project is needed to replace deteriorated portions of the central steam distribution system at ORNL, predominately in the western end of the plant. New isolation valves will be installed to improve efficiency, reliability, and maintainability. Deteriorated air supply lines adjacent to steam lines being replaced will also be replaced. The project will provide a condensate-return system, modifications to connect condensate systems in selected buildings, and other ancillary equipment.

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

\* The increase from the previous cost estimate is explained at the end of Item 9.

## PROJECT DATA SHEETS

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1. Title and location of project: Upgrade Steam Distribution System - West End      2. Project No.: 92-E-323  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee

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9. Purpose, Justification of Need and Scope of Project

The purpose of this project is to replace sections of the central steam and air supply systems, predominately in the west end of ORNL, that have been in service for as long as 30 years and are approaching the end of usable life. The system contains twelve bellows-type expansion joints identical to those that have failed catastrophically in other areas at the laboratory. Underground lines that are replaced will be abandoned in situ except in valve pits. Replaced above-ground lines and lines in valve pits being reused will be removed and disposed of in a suitable landfill.

Deteriorated jacketing has resulted in a saturation of the insulation from steam leaks and ground water. This insulation failure is documented in Facilities Evaluation Study Steam Distribution System, ORNL/CF-83/90. This deteriorated condition, coupled with lack of condensate return, has resulted in large losses of energy. Both the existing steam lines and adjacent air supply lines have begun failing due to corrosion. While failures to date have been predominately pinholes, the potential for significant steam supply failures will increase progressively as the system continues to age. System failure in any of several areas could result in the interruption of experiments which have been ongoing for several years and could impact research and related activity involving multimillion dollar budgets. Furthermore, a steam supply failure could interrupt critical functions, such as cell ventilation or off-gas services required in handling radioactive materials in reactors, isotope facilities, and hot cells, requiring immediate shutdown of operations until the steam supply is restored. Forced expenditures will be required to restore the steam supply in the event of such failures. This will replace the system piecemeal at a higher cost and without the energy cost savings provided with this proposal.

Two alternatives and the proposed system upgrade project are compared in a feasibility study dated February 1, 1984, prepared by an architect-engineer (A-E). The other alternatives are: a low-temperature hot water system, and a high-temperature hot water system.

The first alternative, a low-temperature hot water system, although offering operating savings through lowered energy consumption and maintenance costs, cannot economically support the 70% higher capital costs of installation including the necessary conversion of building heating systems from steam to hot water.

The second alternative, high-temperature hot water system, was quickly determined to be less cost-effective than the low-temperature hot water system as a result of even higher capital costs due to more expensive piping mandated by the use of higher pressures. Furthermore, this option does not offer all of the advantages of the low-temperature system.

PROJECT DATA SHEETS

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1. Title and location of project: Upgrade Steam Distribution System - West End      2. Project No.: 92-E-323  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee

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

If the proposed project is not funded the existing west end portion of the central steam distribution system will be operated with the loss of \$520,000 (FY 1992 dollars) per year in operating funds expended for the extra fuel required to overcome system heat losses due to deterioration of old lines. And, the potential for system failures and their accompanying impacts on research and the operation of critical facilities will continue to increase with age.

As shown in items 5 and 6 on the first page, the total estimated cost for this project has increased \$3,500,000 from the previous estimate. This includes \$1,580,000 for adjustments in labor and material cost factors including escalation to cover the two year delay in the start date from FY 1990 to FY 1992; \$1,200,000 for increased provisions to assure compliance with various regulatory requirements; and, \$720,000 to implement use of a construction manager beginning in FY 1991.

10. Details of Cost Estimate: a/

	<u>Total Cost</u>
a. Engineering, design, and inspection at approximately 15% of construction costs, item b.....	\$ 1,010
b. Construction costs b/.....	<u>6,780</u>
Subtotal.....	7,790
c. Contingency at approximately 16% of above costs.....	<u>1,210</u>
Total estimated construction cost (TECC).....	\$ 9,000

a/ The cost estimate is based on a conceptual design report completed in January 1987 at a cost of \$100,000 and last updated in May 1990.

b/ Construction costs include \$24,000 for readiness reviews.

PROJECT DATA SHEETS

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1. Title and location of project: Upgrade Steam Distribution System - West End      2. Project No.: 92-E-323  
 Oak Ridge National Laboratory  
 Oak Ridge, Tennessee

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11. Method of Performance

Design shall be performed under a negotiated architect-engineer contract and inspection shall be performed by the operating contractor. 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

	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>	<u>Total</u>
a. Total Project Costs (TPC)						
1. Total facility costs						
(a) Construction line item (TECC).....	\$ 0	\$ 300	\$ 3,000	\$ 3,200	\$ 2,500	\$ 9,000
(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....	\$ 0	\$ 300	\$ 3,000	\$ 3,200	\$ 2,500	\$ 9,000
2. Other project funding						
(a) R&D necessary to complete construction.....	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
(b) Conceptual design costs.	100	0	0	0	0	100
(c) Other project related costs.....	30	0	0	0	0	30
Total Other Project Funding.....	\$130	\$ 0	\$ 0	\$ 0	\$ 0	\$ 130
Total project costs (Items 1 & 2).....	<u>\$130</u>	<u>\$ 300</u>	<u>\$ 3,000</u>	<u>\$ 3,200</u>	<u>\$ 2,500</u>	<u>\$ 9,130</u>

PROJECT DATA SHEETS

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1. Title and location of project: Upgrade Steam Distribution System - West End Oak Ridge National Laboratory Oak Ridge, Tennessee	2. Project No.: 92-E-323
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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 equipment  
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  
The conceptual design report was completed in January 1987, at a cost of approximately \$100,000.
  - b. Total related funding requirements  
The estimated useful life of the Upgraded Steam System is 50 years.
    - 1. Facility operating costs a/  
The estimated annual savings in operating the steam system at ORNL is based upon the reduced use of coal (approximately 8,000 tons less per year for a savings of \$360,000 per year), natural gas (approximately 40,000,000 cubic feet per year for a savings of \$140,000 per year), and water and water treatment (approximately 30,000,000 gallons per year for a savings of \$20,000 per year). The total annual savings as a result of reduced heat loss and condensate return is \$520,000 per year.
    - 2. Programmatic operating expenses 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
- a/ This savings is expressed in FY 1992 dollars.

DEPARTMENT OF ENERGY  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
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: East Canyon Electrical Safety Project  
 Lawrence Berkeley Laboratory (LBL)  
 Berkeley, California
2. Project No.: 92-E-322
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- 3a. Date A-E work initiated (Title I design start scheduled): 2nd Qtr FY 1992
- 3b. A-E Work (Titles I & II) Duration: 20 months
- 4a. Date physical construction starts: 2nd Qtr FY 1994
- 4b. Date construction ends: 4th Qtr FY 1995
5. Previous construction cost estimate: None
6. Current construction cost estimate: \$3,900  
 TECC: \$3,900  
 Date: January 1992

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<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	1992	\$ 377	\$ 377	\$ 100
	1993	1,507	1,507	800
	1994	2,016	2,016	2,000
	1995	0	0	1,000

8. Brief Physical Description of Project

This project is the third of several rehabilitation elements that are part of a master plan to improve the reliability of the electrical distribution system of the entire laboratory. The project will utilize the new circuit breakers provided in FY 1987 by the improvements to the main substation (Electrical Project #1). The scope

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

## PROJECT DATA SHEETS

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1. Title and location of project: East Canyon Electrical Safety Project  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California
2. Project No.: 92-E-322
- 

### 8. Brief Physical Description of Project

includes the installation of a new 12kV switching station near the Centennial Drive overpass and new 12kV distribution circuits to laboratory facilities in the East Site area. Also included will be the installation of a new 500 kVA substation with standby generation at Building 72 (National Center for Electron Microscopy). In essence, these improvements will replace the old existing mode of electrical service for the East Site area.

The new switching station will be in a double-ended configuration and utilize 750 MVA, 13.8kV metalclad switchgear. The new 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 switching station, redundant 12kV power circuits will radially branch out and distribute electrical energy to building and laboratory substations. These circuits will utilize 250 MCM power cables, which will be installed in new and existing underground ducts. The redundant supply feeders from the Grizzly Peak main substation to the switching station will be sized 500 MCM and installed in new and existing underground ducts.

These new government-owned facilities will be located on land owned by the University of California and will serve or be operated in conduction with other government-owned facilities at the Lawrence Berkeley Laboratory.

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

The existing 12kV power distribution to the East Site facilities consists of one 12kV cable sized at 500 MCM, which is 21 years old. This cable provides power for Buildings 62, 66, 72, 73, 74, 76, 77, and 83. The total load on this cable is about 6,000 kVA.

The major deficiencies of the existing 12kV power system are:

- o No redundancy: A cable fault will cause extended power outage.
- o No individual ground fault protection: A ground fault will open the main circuit breaker at Grizzly Substation, resulting in a loss of power to the entire East Site.

PROJECT DATA SHEETS

1. Title and location of project: East Canyon Electrical Safety Project  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2. Project No.: 92-E-322

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

- o Difficult to maintain: Since there is no redundancy, preventive maintenance operations can only be accomplished during scheduled shutdowns of the entire East Site.
- o Age of power cable, reaching end of useful life (25 years maximum) and should be replaced.

A new substation at Building 72 (National Center for Electron Microscopy) is required to provide an urgently needed independent power supply system to this major research facility. Currently, this facility is supplied through a low-voltage (480V) power feeder from Building 62 and does not have standby power backup. Power outages adversely affect the operation of the electron microscopes, requiring long time periods for adjustment and recalibration of these major scientific instruments.

10. Details of Cost Estimate a/

Item Costs      Total Cost

a. Engineering, design and inspection @ approximately 15% of construction costs, item b.....		\$ 425
b. Construction costs.....		2,895
(1) Utilities.....	\$ 1,887	
(2) Special Facilities Engineered Equipment.....	923	
(3) Project Management.....	85	
Subtotal.....		<u>3,320</u>
c. Contingency at approximately 17% above costs.....		<u>580</u>
Total estimated cost.....		\$3,900

a/ Construction costs have been escalated at 1.4% for FY 1987, 4.0% for FY 1988, 4.4% for FY 1989, 4.3% for FY 1990, 4.7% for FY 1991, 5.5% for FY 1992, 5.7% for FY 1993, 5.8% for FY 1994, and 1.5 % for FY 1995, compounded to midpoint of construction, December 1994, for a total of 43.6%. Procurement costs have been escalated at 1.4% for FY 1987, 4.0% for FY 1988, 4.4% for FY 1989, 4.3% for FY 1990, 4.7% for FY 1991, 5.5% for FY 1992, 5.7% for FY 1993, and 2.4% for FY 1994, compounded to midpoint of procurement, February 1994, for a total of 37.3%. Conceptual design is complete. PED requirements: None.

PROJECT DATA SHEETS

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1. Title and location of project: East Canyon Electrical Safety Project  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2. Project No.: 92-E-322

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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.

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  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
PROJECT DATA SHEETS  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Fire Safety Improvements Argonne National Laboratory (ANL) Argonne, Illinois	2. Project No. 92-E-321
3a. Date A/E work initiated, (Title I design start scheduled): 2nd Qtr. FY 1992	5. Previous construction cost estimate: None
3b. A/E work (Title I & II) duration: 10 months	6. Current construction cost estimate: \$1,720 TECC: \$1,720 Date: January 1992
4a. Date physical construction starts: 2nd Quarter FY 1993	
4b. Date construction ends: 4th Quarter FY 1994	

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1992	\$ 603	\$ 603	\$ 546
	1993	1,117	1,117	620
	1994	0	0	554

PROJECT DATA SHEETS

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- |  |                         |
|--|-------------------------|
| 1. Title and location of project: Fire Safety Improvements<br>Argonne National Laboratory (ANL)<br>Argonne, Illinois | 2. Project No. 92-E-321 |
|--|-------------------------|
- 

8. Brief Physical Description of Project

The Fire Safety Improvements Project will encompass fire protection system extensions, new installations, and replacements in twenty-nine ANL-E buildings. The project can be grouped into three sub-projects which include extensions or new installations of wet-pipe sprinkler systems, replacement of existing fire alarm panel and detection devices, and extending the fire separation walls around a large computer room.

Of the twenty-nine buildings, six will undergo both sprinkler system and fire alarm/detection system installations, two will undergo only sprinkler system installations, eleven will undergo only fire alarm/detection system installations, one will have fire alarm/detection system installation and wall extension construction, two will undergo sprinkler system extension and fire alarm/detection system installation, and seven will undergo only sprinkler system extensions.

a. Sprinkler System Subproject:

The following nine buildings will have sprinkler systems extended to unprotected areas:

- Building 203 - Extend existing system to protect ATLAS beam line.
- Building 205 - Extend existing system to provide complete protection for J-Wing high bay.
- Building 212 - Extend existing system into Wing DL laboratories to provide complete Wing D protection.
- Building 213 - Extend existing system into refrigeration and food preparation areas of cafeteria.
- Building 330 - Extend existing system into A-Wing to provide complete protection.
- Building 333 - Extend existing system into dormitory, kitchen, conference room, and locker area to provide complete protection for the site fire station.
- Building 340 - Extend existing system into offices and corridor to provide complete building protection.
- Building 362 - Install a sprinkler system for the high bay area to provide complete building protection.
- Building 365 - Extend existing system to operating floor level to provide protection for beam line and storage area.

PROJECT DATA SHEETS

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1. Title and location of project: Fire Safety Improvements  
Argonne National Laboratory (ANL)  
Argonne, Illinois

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2. Project No. 92-E-321

8. Brief Physical Description of Project (Continued)

The following eight buildings will have new sprinkler system installed:

- Building 364 - Install complete system throughout the mechanical room and four levels of storage.
- Building 366 - Install complete system throughout the high bay building.
- Building 369 - Install complete system throughout the high bay building.
- Building 370 - Install complete system throughout the high bay building.
- Building 371 - Install complete system throughout the high bay building and central chilled water plant.
- Building 372 - Install complete system throughout the office building.
- Building 375 - Install complete system throughout the high bay Intense Pulsed Neutron System building.
- Building 376 - Install complete system throughout the high bay building.

b. Fire Detection and Alarm System Subproject:

The twenty buildings scheduled for fire detection and alarm replacements include Buildings 205, 221, 223, 306, 308, 309, 310, 317, 335, 360, 361, 362, 366, 369, 370, 371, 375, 376, 391, and 399.

c. Computer Room Wall Modifications Subproject:

The existing walls of the Main Computer Room in Building 221 need to be upgraded, above the suspended ceiling, to obtain a 1-hour fire resistance rating.

The structural steel above the suspended ceiling is fireproofed with a sprayed asbestos fiber material which will require work to be done in conformance with current OSHA and Argonne National Laboratory procedures for working in an asbestos area.

PROJECT DATA SHEETS

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1. Title and location of project: Fire Safety Improvements Argonne National Laboratory (ANL) Argonne, Illinois	2. Project No. 92-E-321
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9. Purpose, Justification of Need and Scope of Project

The purpose of the Fire Safety Improvements Project is to continue the progress of the selected buildings toward the "Improved Risk" concept as defined in DOE Order 5480.7 Fire Protection. That Order establishes objectives for an "improved risk" level of fire protection which are applicable throughout its facilities.

1. No threats to the public health or welfare will result from fire.
2. There are no undue hazards to employees from fire.
3. Vital Department of Energy programs will not suffer unacceptable delays as a result of fire.
4. Property damage will be held to manageable levels.

Compliance with improved risk criteria objectives have been met when:

1. There are no threats to the public health and welfare and no undue hazards to life from fire.
2. There are no unacceptable impairments to vital DOE programs for a period longer than acceptable to the program division.
3. Automatic fire protection systems are provided when the maximum possible fire loss is in the range of \$1-25 million and a redundant protection system is provided when the loss range is \$25-50 million, so that property damage is limited to \$1 million or less in either case.
4. That facility or program requiring a "higher" standard of protection can expect a loss to be limited to \$250,000 due to the presence of an automatic fire protection system.
5. Delays in project approval or rejection of funding would leave employees of ANL exposed to undue risks of life and safety as a result of fire. Secondly, lack of funding for this project would impair continued operating of vital DOE programs caused by extensive property damage to facilities or programs due to fire.

The three subprojects described below will remedy identified risks to the Laboratory's program, personnel, and physical plant.

## PROJECT DATA SHEETS

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1. Title and location of project: Fire Safety Improvements  
Argonne National Laboratory (ANL)  
Argonne, Illinois

2. Project No. 92-E-321

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

a. Sprinkler System Subprojects

In conformance with DOE Order 5480.7, the Factory Mutual (FM) Research Corporation was retained by Headquarters to survey the improved risk status of DOE facilities (DOE Contract No. DE-AC01-84PE-17056). Numerous recommendations were issued. In February, 1988, the Industrial Safety and Fire Protection (ISFP) Appraisal conducted by the Chicago Operations Office, issued Recommendation No. ISFP-88-3 to Argonne to develop and implement a program for completion of the outstanding FM recommendations. This project will provide for the completion of four of those recommendations pertaining to the installation of an automatic sprinkler system.

Of the seventeen buildings in this subproject, nine buildings will have sprinkler systems extended to unprotected areas and eight buildings will have new systems installed throughout. All systems will be of the wet-pipe type designed to protect Ordinary Hazard occupancies in accordance with NFPA 13 Standard for the Installation of Sprinkler Systems as directed by DOE Order 6430.1A General Design Criteria.

When Argonne last received fire safety improvement funding for sprinkler system installations (late 1970's and early 1980's), the 360 area buildings were in the process of decommissioning from the Zero Gradient Synchrotron (ZGS) program. Since no new program had been identified for these facilities, sprinkler systems were not planned. Over the last eight years, programs have begun occupying parts of these buildings.

b. Fire Detection and Alarm System Subproject:

The existing systems in the earlier identified twenty buildings are 25 to 35 years old. These systems have numerous shortcomings:

1. They are near or at capacity thereby prohibiting expansion for occupancy changes or building additions.
2. The components are no longer manufactured or sold.
3. Smoke detectors cannot be installed where preferred over the use of heat detectors since some systems will not accommodate smoke detectors. This can result in slow detection in areas with high value electronics and computer systems.

PROJECT DATA SHEETS

1. Title and location of project: Fire Safety Improvements  
Argonne National Laboratory (ANL)  
Argonne, Illinois
2. Project No. 92-E-321

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

- 4. Many of the systems do not meet current National Fire Protection Standards.
- 5. Many of the systems utilize 220 Volt DC circuitry. New systems are designed for better personnel safety using 24 volts DC circuitry and modular components.
- 6. Reliability has decreased which results in an increased number of false alarms and failures to report the alarms.

c. Computer Room Wall Modifications Subproject:

A 1-hour fire resistance noting on the perimeter walls surrounding the main computer room in Building 221 is required by DOE/EP-0108, Standard for Fire Protection of DOE Electronic Computer/Data Processing Systems. Recent occupancy changes and existing wall deficiencies necessitate the upgrading.

10. Details of Cost Estimates a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. (1) Engineering, design and inspection at approximately 12% of construction costs.....		\$ 150
(2) Construction management at 3% of construction costs.....		35
(3) Project management at 3.5% of construction costs.....		30
b. Construction costs.....		1,280
(1) Automatic Sprinkler Protection.....	\$ 654	
(2) Fire Detection and Alarm Systems.....	604	
(3) Wall Construction.....	22	
Subtotal.....		<u>1,495</u>
c. Contingency at approximately 15% of the above cost.....		225
Total estimated construction costs (TECC)...		<u>\$ 1,720b/</u>

a/ Based upon a completed conceptual design and current cost data - at time of estimation (1989).

b/ All costs have been escalated from January 1990 to the midpoint of construction. Escalation rate methodology is based on DOE Guidance as follows: for FY 1990 - 4.3%; for FY 1991 - 4.70%; for FY 1992 - 5.50%; for FY 1993 - 5.70%; for FY 1994 - 5.8%

PROJECT DATA SHEETS

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1. Title and location of project: Fire Safety Improvements  
Argonne National Laboratory (ANL)  
Argonne, Illinois
2. Project No. 92-E-321
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11. Method of Performance

Engineering, design and inspection will be performed by Laboratory engineering personnel, aided by outside A/E firm. 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.

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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: Roof Replacements, Phase I<br>Lawrence Berkeley Laboratory (LBL)<br>Berkeley, California | 2. Project No.: 92-E-312  |
| 3a. Date A-E work initiated: 2nd Qtr. FY 1992  | 5. Previous construction cost estimate: None  |
| 3b. A-E work (Title I & II) duration: 24 months  | 6. Current construction cost estimate: \$ 2,500<br>TECC: 2,500<br>TPC: \$ 2,500<br>Date: January 1992 |
| 4. Date physical construction starts: 3rd Qtr. FY 1993   | 4. Date construction ends: 3rd Qtr. FY 1995   |

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1992	\$ 2,000	\$ 2,000	\$ 155
	1993	500	500	703
	1994	0	0	1,148
	1995	0	0	494

PROJECT DATA SHEETS

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|--|--------------------------|
| 1. Title and location of project: Roof Replacements, Phase I<br>Lawrence Berkeley Laboratory (LBL)<br>Berkeley, California | 2. Project No.: 92-E-312 |
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8. Brief Physical Description of Project

The proposed three year \$2.5M project will replace over 115,000 sq. ft. of high maintenance roofs in most critical need of repair/replacement. The roofing system which has been selected, is a 3-ply modified bitumen for thermal expansion/contraction and vibration from mechanical sources, strength and durability for foot traffic and ease of maintenance and repair. New roof insulation will be installed. Where rooftop equipment platforms are disassembled to accommodate new roof construction, they will be redesigned and rebuilt to facilitate ease of room maintenance, repair or replacement and ease of equipment maintenance and repair. Equipment on platforms will be braced to conform with the latest seismic codes.

These improvements to existing government-owned facilities will be located on land owned by the University of California and will serve or be operated in conjunction with other government-owned facilities at the Lawrence Berkeley Laboratory.

9. Purpose, Justification of Need and Scope of Project

The Laboratory occupies 80 permanent buildings on the main site, two-thirds of which are 20 years or older. With few exceptions, the same proportion of these buildings have therefore exceeded their recommended service life of 20 years. Exposure to the elements over time progressively erodes the roof system's ability to maintain its waterproof properties, resulting in failure (leakage). Roof leakage compromises the integrity of the roof system and structure, and progressive worsening leads to damage of the building and its contents, disrupting affected research programs. Repairs are generally implemented as part of an overall facilities maintenance program, however, when repairs are no longer cost effective, resurfacing or complete roof replacement is recommended.

At the Laboratory, the problem of roof failure due to prolonged exposure is compounded by roof platforms which support mechanical equipment. Ideally, platform design should be fully integrated with roof design. That is, roof maintenance, resurfacing, or replacement should be able to occur independently of the platform and equipment which it supports. Instead, ad hoc platform installations and equipment protrusions have made roof maintenance awkward and difficult. The majority of existing platforms impede resurfacing or replacing roofs because they must be totally disassembled and rebuilt to accommodate the process, adding substantially to costs.

PROJECT DATA SHEETS

1. Title and location of project: Roof Replacements, Phase I  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2. Project No.: 92-E-312

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

The roofs which will be replaced are characterized by old age, deterioration, high maintenance and as having long outlived their recommended service life of 20 years. The average age is 34 years old. About half are 40 years and older, although about two-thirds of the square footage slated for replacement falls within the 25-30 year range. These roofs are characterized by widespread failure (leakage) and are no longer cost effective to maintain. In FY 1989, over a quarter of a million dollars was spent to maintain the Laboratory's 800,000 sq. ft. of roofs. It is projected that this will only accelerate with time due to increasing age and escalation.

Replacement of the roofs earmarked for this project will reduce associated disruptions. Requisite related work will fully integrate the redesign and rebuilding of rooftop equipment platforms with roof design. The integration will facilitate ease of maintenance and repair of the roof and its associated equipment.

Besides eliminating problems directly associated with roof failure, another benefit will be realized as well. New insulation installed between the existing roof structure and the new roof membrane will be of an R Value and thickness to optimize building energy efficiency, thereby decreasing energy use. On average, the new insulation will save about \$66K/year in energy costs.

10. Details of Cost Estimate a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. Engineering, design and inspection at approximately 17% of construction costs, item b .....		\$ 305
b. Construction costs .....		1,775
(1) Improvements to land .....	0	
(2) Building .....	\$ 1,690	
(3) Project Management (5% of construction cost) .....	85	
	Subtotal .....	<u>2,080</u>
c. Contingency @ 20% of above costs .....		<u>420</u>
	Total estimated project cost.....	\$2,500

a/ Based on completed conceptual design. Includes escalation at the rates of 4.3% for FY 1990, 4.7% for FY 1991, 5.5% for FY 1992, 5.7% for FY 1993 and 5.8% for FY 1994.

PROJECT DATA SHEETS

- 
1. Title and location of project: Roof Replacements, Phase I                      2. Project No.: 92-E-312  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California
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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 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: Sanitary System Modification - Phase I Brookhaven National Laboratory (BNL) Upton, New York	2. Project No.: 92-E-309
3a. Date A-E work initiated (Title I design start scheduled): 1st Qtr FY 1992	5. Previous construction cost estimate: None
3b. A-E work (Titles I & II) duration: 8 months	
4a. Date physical construction starts: 4th Qtr FY 1992	6. Current construction cost estimate: \$4,000 TECC: \$4,000 TPC: \$4,000 Date: January 1992
4b. Date construction ends: 3rd Qtr FY 1994	

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1992	\$ 1,238	\$ 1,238	\$ 620
	1993	2,762	2,762	1,700
	1994	0	0	1,680

PROJECT DATA SHEETS

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|---|-------------------------|
| 1. Title and location of project: Sanitary System Modification - Phase I<br>Brookhaven National Laboratory (BNL)<br>Upton, New York | 2. Project No. 92-E-309 |
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8. Brief Physical Description of Project

This project begins the rehabilitation of the sanitary system as outlined in our Master Plan, Sanitary Utility 1989 - 2000. This project provides the first phase of implementing the rehabilitation projects which affect the ability of the existing system to properly collect and treat the sanitary wastes generated by the Brookhaven facility.

Included in the first phase of work are the following improvements:

- a. Automate the primary clarifier bypass sluice gate, first dosing chamber feed slide gate, and second dosing chamber bypass slide gate, which are currently manually operated.
- b. Add a second primary clarifier to the Sewerage Treatment Plant.
- c. Install a new leachate collection system for the sludge and scum lagoon.
- d. Replacement of defective sewer pipe to stop exfiltration of waste water.
- e. Replacement or repair of defective manholes that are either operational or safety related.
- f. Replacement of approximately 900 feet out of 6,000 feet of undersized sewer pipe as part of Phase I.

9. Purpose, Justification of Need and Scope of Project

Based on recent continued growth at the laboratory, expansion through 1994 is projected to include the addition of 10 new buildings. These buildings will be occupied by as many as 1,100 people. Many of these people would be relocated from the 16 buildings presently slated for demolition during this time period. The overall influx of new personnel will range between 400-700, bringing the maximum population at the site to between 5,100 and 5,400. This includes short-term visitors to the laboratory.

## PROJECT DATA SHEETS

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| 1. Title and location of project: Sanitary System Modification - Phase I<br>Brookhaven National Laboratory (BNL)<br>Upton, New York | 2. Project No. 92-E-309 |
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### 9. Purpose, Justification of Need and Scope of Project (Continued)

As a result of this growth, to upgrade the various sanitary facilities to current day standards and to meet performance objectives of the Tiger Team assessment, the following work needs to be performed:

#### Waste Water Treatment Plant Improvements

- a. Remedy Emergency Bypass Conditions: In order to more accurately control flow during emergency conditions, the primary clarifier bypass sluice gate, first dosing chamber feed slide gate, and second dosing chamber bypass slide gate, which are currently manually operated will be automated. This will entail the installation of motor operators on each gate and the associated instrumentation to start, stop and control the bypass. The initiation of a bypass will then be remotely controlled from the service building (#575).
- b. Primary Clarifier (#588): It is the best management practice to meet requirements of the "Ten-State Standards" which have been adopted by the NYSDEC as its recommended design criteria for sewerage treatment plants which require that all plants with a design flow of more than 100,000 gpd have more than one clarifier capable of independent operation. The performance objective of SW/BMPF-5, Sewage Treatment Plant Deficiencies, listed in the Tiger Team Assessment, makes mention of this. A second primary clarifier will be installed in the Phase I modification. This will permit compliance with the design criteria and permit maintenance to be performed on the clarifier without discharging untreated sewage.
- c. Primary Digester Building - Sludge and Scum Lagoons (#587): In order to upgrade the condition of this facility, a new leachate collection system for the sludge and scum lagoon will be installed.

#### Sewage Collection System Improvements

As a result of this visual inspection made of the sewage collection system, and the performance objective of SW/BMPF-3 Deteriorating Sewer Lines, as listed in the Tiger Team Assessment, the following improvements need to be made to the system in order to bring its operation up to an acceptable operating level and comply with effluent discharge criteria.

PROJECT DATA SHEETS

1. Title and location of project: Sanitary System Modification - Phase I  
Brookhaven National Laboratory (BNL)  
Upton, New York

2. Project No. 92-E-309

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

The required tasks are:

- a. Correction of crooked or broken pipes, root intrusions and open joints.
- b. Replacement of defective manholes which are also a safety hazard.
- c. Exposed sewer main pipe needs to be covered with fill to protect it from possible damage.
- d. Correction of the influent flow to stop exfiltration of sewage.

10. Details of Cost Estimates a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. Engineering, design and inspection at approximately 14% of construction costs, item c.....		\$ 440
b. Construction management at 2% of construction costs, item c...		63
c. General Construction.....		3,140
(1) WWTF Improvements.....	\$ 1,125	
(2) Defective Sewer Pipe Replacement.....	1,825	
(3) Manhole Repair.....	50	
(4) Undersized Pipe Replacement.....	140	
Subtotal.....		<u>\$ 3,643</u>
d. Contingency at approximately 10% of the above cost.....		357
Total estimated construction costs (TECC)		<u>\$ 4,000</u>

a/ This estimate is based on a conceptual design. Escalation rates used were taken from DOE Departmental Price Change Index - FY 91 Guidance: 3.6% (FY 1991), 3.5% (FY 1992), 4.0% (FY 1993) and 4.5% (FY 1994).



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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 90 Seismic Rehabilitation Lawrence Berkeley Laboratory (LBL) Berkeley, California	2. Project No. 91-E-323
3a. Date A-E work initiated (Title I design start scheduled): 2nd Qtr FY 1991 3b. A-E work (Titles I & II) duration: 15 months 4a. Date physical construction starts: 2nd Qtr FY 1994 4b. Date construction ends: 2nd Qtr FY 1994	5. Previous construction cost estimate: None  6. Current construction cost estimate: \$6,800 TECC: \$6,800 TPC: \$6,900 Date: January 1992

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1991	\$3,678	\$3,678	\$ 36
	1992	2,700	2,700	3,000
	1993	422	422	2,364
	1994	0	0	1,400

## PROJECT DATA SHEETS

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1. Title and location of project: Building 90 Seismic Rehabilitation Lawrence Berkeley Laboratory (LBL) Berkeley, California	2. Project No. 91-E-323
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### 8. Brief Physical Description of Project

Building 90 is a four-story structural steel office building with a partial base which contains 88,301 gross square feet and has an occupancy capacity of 380 people. It was designed to the 1955 Uniform Building Code which did not reflect the maximum design earthquake now anticipated on the nearby Hayward Fault. The structure is much too flexible and would experience extreme stresses and inelastic lateral deflections in the event of a major earthquake rendering the building uninhabitable and nonrepairable. Building 90 has also experienced continuous foundation settlement since it was constructed in 1959 due to overloading of the foundation bearing strata. Differential settlement has distorted the structural steel building frame causing additional static stresses in related columns and beams.

The proposed project will brace the building to withstand the maximum design earthquake on the Hayward Fault and eliminate stresses induced by long term differential settlement. Seismic strengthening will be accomplished utilizing exterior braced steel frames connected to the existing main structural steel frame on the north, south and west sides of the building. Seismic bracing, which will mitigate the most dangerous hazards, will be accomplished first. Differential settlement and related stresses will be reduced by jacking existing columns after bracing construction is complete. Non-structural components, which could be life safety hazards in the event of a strong earthquake, will be eliminated by bracing the suspended ceiling grid and air handling ductwork above the suspended ceiling. This work will be accomplished in parallel with bracing construction.

Sides at either end of the structure will be stabilized with "tie back" lateral support systems. These systems will consist of vertical steel beams encased in concrete caissons drilled through the slide into bedrock with steel tieback anchor sloping down from the beam tops and grouted into rock behind the slide plane. A

PROJECT DATA SHEETS

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1. Title and location of project: Building 90 Seismic Rehabilitation Lawrence Berkeley Laboratory (LBL) Berkeley, California	2. Project No. 91-E-323
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8. Brief Physical Description of Project (Continued)

horizontal reinforced concrete grade beam will be installed interconnecting and encasing the tops of the vertical beams. Subsurface drainage systems consisting of horizontal hydraugers will be installed to minimize hydrostatic pressure at the plane of the shear key caissons.

The use of the strengthened building will not change. No new floor space will be added.

These improvements to existing government-owned facilities will be located on land owned by the University of California and will serve or be operated in conjunction with other government-owned facilities at the Lawrence Berkeley Laboratory.

9. Purpose, Justification of Need and Scope of Project

In the event of a major earthquake on the nearby Hayward Fault, Building 90 would suffer irreparable damage rendering it uninhabitable for further use. A panel of independent consulting structural and geotechnical engineers has reviewed Building 90 and related dynamic structural analyses. The panel has confirmed the conclusions summarized above and recommended corrective measures described below. Although it is anticipated that the building would not experience catastrophic collapse, earthquake shaking would result in significant hazards resulting in personal injury to the occupants as well as severe damage to equipment and personal property. In the aftermath of such an earthquake, 380 persons would have to be relocated to leased offsite space for a minimum period of three years, provided capital funding for replacement of the building were immediately available. Existing Building 90 would have to be demolished and replaced.

## PROJECT DATA SHEETS

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|--|-------------------------|
| 1. Title and location of project: Building 90 Seismic Rehabilitation<br>Lawrence Berkeley Laboratory (LBL)<br>Berkeley, California | 2. Project No. 91-E-323 |
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9. Purpose, Justification of Need and Scope of Project (Continued)

The out of pocket costs for remedy would be approximately \$30 million not including lost time due to disruption (minimum loss of six months for DOE programs and support services requiring relocation) or the inefficiencies due to the remote location of program and support services off site for an additional two and one-half years.

During the magnitude 7.1 Loma Prieta Earthquake of October 17, 1989, Building 90 experienced strong shaking in spite of its 104km distance from the epicenter. Although structural deflections remained within the elastic range, minor non-structural damage occurred and occupants were severely affected. It is obvious that a strong earthquake on the Hayward Fault would have the effects predicted by the independent review panel.

There are large ancient landslides at either end of Building 90. The slide northwest of Building 90 has experienced downward creep movement for many years causing settlement for road paving about 60 feet from the northwest corner of the building. Although the building's foundation caissons extend below the slip plane of the landslide, the effect of precipitous downward movement of the slide during heavy ground shaking could reduce subsurface lateral support of the caissons. A portion of the ancient slide body southeast of Building 90 underlies the spread footing under the partial basement. This poorly consolidated material which contributes to differential settlement, would also be susceptible to lateral movement during heavy shaking. To ensure that these slides will not adversely affect Building 90 under either static or seismic conditions, this project will stabilize these slides through installation of tie-back walls at either end of the building.

Strengthening of the building and stabilization of the slides will protect the building, occupants and DOE programs from the potentially disastrous effects of strong earthquakes on the nearby Hayward Fault and in the San Francisco Bay Area in general.

PROJECT DATA SHEETS

1. Title and location of project: Building 90 Seismic Rehabilitation Lawrence Berkeley Laboratory (LBL) Berkeley, California	2. Project No. 91-E-323
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<u>10. Details of Cost Estimate</u> a/	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design, and inspection @ approximately 17% of construction costs, item b. 1 & 2.....		\$ 755
b. Construction costs.....		4,480
(1) Improvements to land.....	\$1,410	
Site Work.....	\$ 155	
Tie-Back Walls.....	1,255	
(2) Building improvements.....	2,910	
Structural Bracing.....	1,725	
Column Jacking.....	960	
Non-Structural Bracing.....	225	
(3) Project management.....	160	
c. Relocations.....		465
Subtotal.....		<u>\$5,700</u>
d. Contingency @ approximately 19% of above costs.....		1,100
Total estimated construction cost (TECC).....		<u>\$6,800</u>

a/ Construction costs have been escalated at 1.9% for FY 1987, 4.0% for FY 1988, 4.4% for FY 1989, 4.3% for FY 1990, 4.7% for FY 1991, 5.5% for FY 1992, and 5.8% for FY 1993, compounded to midpoints of phased construction.

Conceptual design is complete.  
 PED requirements: none.

PROJECT DATA SHEETS

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1. Title and location of project: Building 90 Seismic Rehabilitation  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2. Project No. 91-E-323

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11. Method of Performance

Structural design and construction contract documents will be performed by subcontracted A/E design firms in close consultation with LBL, structural and geotechnical consultants. A third party structural review will be performed by a structural engineering firm specializing in earthquake engineering.

Construction will be accomplished by prequalified construction contractors under lump sum contracts awarded after competitive bidding.

Construction inspection will be performed by the LBL Plant Engineering Department with the assistance of a geotechnical consultant and an independent testing laboratory.

Some minor design and construction may be performed by LBL personnel.

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

	<u>Prior Yrs.</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>Total</u>
a. Total project costs (TPC)						
1. Total facility costs						
(a) Construction line item						
(TECC).....	\$ 0	\$1,600	\$2,300	\$1,500	\$1,400	\$6,800
Total direct costs.....	\$ 0	\$1,600	\$2,300	\$1,500	\$1,400	\$6,800
b. Total related funding requirements (estimated)						
1. Operating expenses directly						
related to facility..	\$ 100	\$ 0	\$ 0	\$ 0	\$ 0	\$ 100
Total project costs.....	\$ 100	\$1,600	\$2,300	\$1,500	\$1,400	\$6,900

PROJECT DATA SHEETS

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1. Title and location of project: Building 90 Seismic Rehabilitation  
Lawrence Berkeley Laboratory  
Berkeley, California

2. Project No. 91-E-323

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

- a. Total project funding  
No applicable construction line item.
- b. Total related funding requirements  
Not applicable.

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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.)

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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.: 90-R-112

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3a. Date A-E Work Initiated (Title I Design): 1st Qtr. FY 1992

3b. A-E Work (Title I & II) Duration: 4 months\*

4a. Date physical construction starts: 2nd Qtr. FY 1993

4b. Date Construction Ends: 2nd Qtr. FY 1994

5. Previous construction cost estimate: \$4,430

6. Current construction cost estimate: \$4,730  
 TECC: \$4,730  
 TPC: \$4,950  
 Date: January 1992

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<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
	1990	\$ 884	\$ 884	\$ 0
	1991	3,082	3,082	5
	1992	0	300 a/	2,609
	1993	464	464	1,820
	1994	0	0	296

\* Design for site work and utilities only; the building will be modular construction with the design included in the building contract.

a/ \$300,000 reprogrammed from completed prior year project (87-R-752).

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.: 90-R-112

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8. Brief Physical Description of Project

The proposed project will construct a two-story building providing approximately 14,800 sq. ft. in the Instruments and Controls complex area. It will contain offices, testing areas for instrumentation and automation systems, a process instrument shop, chemical laboratory support, a conference/training room and service areas for utilities, power and other building operations support systems. Telecommunication features will include voice, data, and public address systems.

The offices and testing areas will accommodate about 42 people. The test areas will consist of rooms which will be used for staging and testing electro-optics, dust sensitive assemblies and devices, electro-magnetic interference/radio frequency interference (EMI/RFI) sensitive and other electronics, and computer systems. A process instrument shop will be provided for maintenance and assembly of instrument systems.

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

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

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

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

The original scope of the project described above, which was based on a conceptual design completed in January, 1987, has been changed. The reasons are described below.

The original project scope included demolishing an existing "temporary" wooden building, constructed during the 1940s, disposing of the scrap and spoils and, then, restoring the site so that the new building could be constructed on the same location. The old wooden structure has some radioactive contamination and a considerable amount of asbestos materials in several different forms. The total estimated construction cost of \$4,430,000 for

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.: 90-R-112

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8. Brief Physical Description of Project (Continued)

the original scope was based on the conceptual design completed in January of 1987. From that time until the project was authorized in FY 1990, several things happened that impacted project cost. Increased regulatory requirements and the Department of Energy's increase emphasis on the Occupational Health and Safety Administration (OSHA) compliance resulted in significant cost growth, especially involving work around or disposal of radioactive contaminated waste and asbestos materials. Procurement policy was also changed to require that telecommunications equipment be purchased instead of leased and the cost charged to the project. In addition, when the original estimate was made, fixed price construction contracts were managed by DOE - Oak Ridge Operations Office personnel at no cost to the projects. In October 1990 a construction manager was contracted to perform this function with the cost being charged to the project. A re-estimate of the project scope in light of the increased requirements and changes showed that the total cost would exceed the authorized TECC.

An extensive study was initiated in FY 1990 to determine ways for containing costs. This included an investigation of innovative construction techniques (including modular buildings) and an analysis of several alternative combinations of the original scope. The primary alternatives considered were:

- a. demolish the old building and construct a new building on the same site,
- b. demolish part of the old building and construct a new building on the same site, and
- c. do not demolish the old building and build a new building on another location.

Because of the pressing need for adequate functional space and concern for potential complications with waste management that could result from latent conditions in the old building, the recommended action is to build a new 14,800 sq. ft. building on another site near the Instruments and Controls complex. The new building would be dedicated to development and maintenance activities for a wide variety of controls and automation systems in support of ORNL programs. To facilitate this, the basic design approach to the building would be changed from one featuring several different types of specialized laboratories to one having more generic electronics laboratories with in-the-floor utility and cable chases that provide greater flexibility for responding to changing needs in the future. The chemical laboratories which supported Industrial Hygiene and Environmental and Occupational Safety groups would be eliminated from the new design and provided in another facility being planned to accommodate the expanding needs of those functions.

The cost containment study, which delayed the start of design, was completed in December 1990, revised NEPA documentation was submitted January 1991, and the revised design criteria for the new building was issued in March

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.: 90-R-112

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8. Brief Physical Description of Project (Continued)

1991. This delay has caused a dramatic shift in the project funding requirements, as reflected in the Financial Schedule shown in Item 7. In August 1991, a request for reprogramming \$300,000 in FY 1991 to increase the TECC was submitted to partially offset the reduction in floor space that was necessitated as part of the cost containment effort.

Funding for FY 1993 will be used to complete construction including utility tie-ins and finish site work.

9. Purpose, Justification of Need 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 room inadequate for current and projected needs.

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

- a. Rehabilitation of other existing space cannot be cost-effectively accomplished.
- b. Major losses in productivity due to the currently inadequate facilities.
- c. The need for adequate long-term housing for the Instruments and Controls functions.

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

The following alternatives were considered for this project.

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

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

PROJECT DATA SHEETS

1. Title and location of project: Measurements and Controls Support Facility  
Oak Ridge National Laboratory (ORNL)  
Oak Ridge, Tennessee

2. Project No.: 90-R-112

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

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

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

Use of the metric system of measurement for design, procurement and construction was considered for this project; but, because of its size and the prevailing practices in the region, it was determined to be uneconomical.

10. Details of Cost Estimate a/

	<u>Item Cost</u>	<u>Total Cost</u>
a. (1) Engineering, design, and inspection at approx. 9.2% of construction costs, item b.		\$ 312
(2) Construction management costs at approx. 12% of construction costs, item b. . . .		402
b. Construction costs: <u>b/</u> . . . . .		3,364
(1) Improvements to land . . . . .	\$ 362	
(2) Building costs, approximately 14,800 sq ft @ approximately \$175/sf. . . . .	2,590	
(3) Outside utilities . . . . .	412	
c. Standard Equipment (conf. room and office furniture) . . . . .		32
Subtotal . . . . .		<u>4,110</u>
d. Contingency at approximately 15% of above costs . . . . .		<u>620</u>
Total Project Cost . . . . .		\$4,730

a/ The cost estimate is based on a completed design criteria, issued in April 1991, at a cost of \$100,000. The DOE Headquarters Economic Escalation Indices for Construction Projects were used as appropriate over the project cycle. The conceptual design was completed in January 1987 at a cost of \$120,000. The estimate was updated in September 1991, to cover the cost of increased health and safety requirements and rate changes for engineering and construction management.

b/ Construction costs includes \$20,000 for readiness reviews.

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.: 90-R-112

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11. Method of Performance

To the extent feasible, modular building techniques will be used for the design and construction of the building. Design of the site work and utilities will be performed under a negotiated architect-engineer contract. All design, procurement and construction will be accomplished by fixed-price contracts awarded on the bases 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 Requirements

Not Required.

DEPARTMENT OF ENERGY  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
PROJECT DATA SHEETS  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Environmental Health and Safety Project Lawrence Berkeley Laboratory (LBL) Berkeley, California	2. Project No.: 88-R-806
3a. Date A-E work initiated: 2nd Qtr. FY 1988	5. Previous construction cost estimate: \$9,163
3b. A/E work (Title I & II) duration: 45 months	
4a. Date physical construction starts: 2nd Qtr. FY 1988	6. Current construction cost estimate: \$ 13,163
4b. Date construction ends: 4th Qtr. FY 1995	TECC: 0 TPC: \$ 13,225 Date: January 1992

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	1988	\$ 850	\$ 850	\$ 59
	1989	2,429	2,429	1,090
	1990	4,310	4,310	172
	1991	1,574	1,574	891
	1992	500	500	4,500
	1993	1,500	1,500	4,000
	1994	2,000	2,000	1,500
	1995	0	0	951

8. Brief Physical Description of Project

The project includes nine subprojects. They are all intended for a strong common purpose: The protection and improvement of the environment and the health and safety of Lawrence Berkeley Laboratory (LBL) employees and the

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

PROJECT DATA SHEETS

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1. Title and location of project: Environmental Health and 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)

general public. These improvements will not eliminate every deficiency in these areas of concern. They will, however, correct the more urgent and serious deficiencies which pose the greatest threat of pollution, contamination, accident, or disruption of program activities.

a. Air Sampling/Monitoring

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

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, cementitious exterior siding, gypsum wallboard partitions, insulation, suspended ceilings, and resilient floor covering. Power, lighting, heating, cooling, 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. Ventilation Improvements

Rehabilitate building ventilation systems by rebuilding and replacing defective and deteriorated air supply systems, controls, and fume hood exhaust systems. Major work will occur in the Building 70 Laboratory Complex. Ventilation improvements will be performed in 23 additional buildings.

d. Water Supply Cross-Connection

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

PROJECT DATA SHEETS

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1. Title and location of project: Environmental Health and 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)

e. Emergency Shower Water Supply Conversion

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

f. Area Lighting

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

g. Replace Drum Storage Racks

Replace existing drum storage racks with code compliant centrally located storage and dispensing enclosures. Provide storage cabinets and lockers for limited inside storage of flammable/combustible liquids. The existing storage racks will be dismantled and scrapped.

h. Building 77 Chemical Storage Facility

Provide a Chemical Storage Facility to store chemicals for the Building 77 Waste Treatment Unit. The installation will consist of four separate one story enclosures with secondary containments to store compatible chemicals. They will be steel-framed structures with reinforced concrete footings, metal roof and siding. This facility will have steel shelving, utilities, lighting, and ventilation. All exterior will have corrosion-resistant coatings.

i. 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.

These improvements to existing government-owned facilities will be located on leased land owned by the University of California and will serve or be operated in conjunction with other government-owned facilities at the Lawrence Berkeley Laboratory.

PROJECT DATA SHEETS

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1. Title and location of project: Environmental Health and 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. 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.

Supplemental funding of \$3,200,000 is required in order to perform the planned Construction activities in occupied space. Construction in occupied space produces inefficiencies and additional costs that were not included in the original Conceptual Design Report. Special arrangements will be made with building and laboratory occupants to minimize interruption of ongoing research activities through phasing of rehab work and, when necessary, performing construction during off hours, weekends, and holidays.

PROJECT DATA SHEETS

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1. Title and location of project: Environmental Health and 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)

d. 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.

e. Emergency Shower Water Supply Conversion

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

f. Area Lighting

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

g. Replace Drum Storage Racks

Existing sitewide installations have deteriorated with time. Some areas lack proper containment provisions. New environmental concerns require proper storage, dispensing, and handling to avoid leaks and spills.

Supplemental funding of \$800,000 is required for site construction and acquisition of pre-engineered enclosures, storage cabinets and lockers.

Regulation changes some of the original Competual Designs in 1987 now prohibit storage of dispensing drums in the horizontal position as was originally envisioned, and waste minimization planning at the laboratory have changed the requirement for the storage of drums. Central storage and dispensing is not required form pre-engineered facilities with code compliant spill containment, ventilation, lighting, security, weather and fire protection and seismic provisions. Additionally, satellite locations will be serviced with code compliant storage cabinets for temporary storage and dispensing requirements. Disposal of existing drum storage racks will be completed.

PROJECT DATA SHEETS

1. Title and location of project: Environmental Health and Safety Project  
 Lawrence Berkeley Laboratory (LBL)  
 Berkeley, California

2. Project No.: 88-R-806

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

h. Building 77 Chemical Storage Facility

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

i. 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.

10. Details of Cost Estimate \*

	<u>Item Costs</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ about 20% of construction, Item b.....		\$ 1,647
b. Construction costs.....		8,281
(1) Improvements to land.....	\$ 29	
(2) Buildings.....	5,765	
(3) Other construction (other than buildings).....	864	
(4) Special facilities.....	376	
(5) Utilities.....	774	
(6) Project management .....	473	
c. Standard equipment.....		1,580
d. Removal costs less salvage.....		14
Subtotal .....		11,522
e. Contingency at about 20% (of which \$780 is for building construction).....		1,641
Total estimated cost .....		\$ 13,163

Construction costs were previously escalated from January 1, 1986 to midpoint of construction for each project. Escalation rates were 1.3% for FY 86, 1.9% for FY 87, 3.4% for FY 89, and 4.8% for FY 90, 5.0% for FY 91, 5.1% for FY 92, 5.3% for FY 93 and 5.5% for FY 94.

PROJECT DATA SHEETS

1. Title and location of project: Environmental Health and Safety Project  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2. Project No.: 88-R-806

11. Method of Performance

Engineering, design and inspection will be performed under a negotiated Architect-Engineer Subcontracts. Inspection, some engineering and some construction will be accomplished by LBL forces. Construction and Procurement for all subprojects except the Site Ventilation Improvements subprojected will be accomplished by LBL Construction forces or by fixed price subcontracts awarded on the basis of competitive bids. This Site Ventilation Improvements subproject will be accomplished by subcontract awarded on the basis of price and other factors including past successful performance.

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

	<u>Prior Yrs.</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>	<u>Total</u>
a. Total project costs							
1. Total facility costs							
(a) Construction line item..	\$ 1,321	\$ 891	\$ 4,500	\$ 4,000	\$ 1,500	\$ 951	\$ 13,163
Total direct costs.....	\$ 1,321	\$ 891	\$ 4,500	\$ 4,000	\$ 1,500	\$ 951	\$ 13,163
2. Other Project Costs							
(b) Conceptual Design .....	41	0	21	0	0	0	62
Total project cost .....	\$ 1,362	\$ 891	\$ 4,521	\$ 4,000	\$ 1,500	\$ 951	\$ 13,225
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.

The nine sub-projects that compose the total EH&S(ER) Project are self-sustaining requiring no additional equipment or facilities.

DEPARTMENT OF ENERGY  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
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ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
MULTIPROGRAM ENERGY LABORATORIES - TIGER TEAM REMEDIATIONS  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Hazardous Materials Safeguards, Phase I Lawrence Berkeley Laboratory Berkeley, California	2. Project No.: 93-E-324
3a. Date A-E work initiated (Title I design start scheduled): 2nd Qtr FY 1993	5. Previous construction cost estimate: None
3b. A-E work (Titles I & II) duration: 15 months	
4a. Date physical construction starts: 3rd Qtr FY 1994	6. Current construction cost estimate: \$5,100
4b. Date construction ends: 2nd Qtr FY 1995	TECC: \$5,100 TPC: \$5,160 Date: January 1992

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	FY 1993	\$ 1,500	\$ 1,500	\$ 500
	FY 1994	3,600	3,600	2,300
	FY 1995	0	0	2,300

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

## PROJECT DATA SHEETS

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1. Title and location of project: Hazardous Materials Safeguards, Phase I  
Lawrence Berkeley Laboratory  
Berkeley, California

2. Project No.: 93-E-324

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### 8. Brief Physical Description of Project

This project will upgrade Building 70 to add safety, health and environmental protection safeguards to meet or exceed current standards of public health and safety. When completed the building will meet the requirements of the 1988 editions of the Uniform Fire Code (UBC and UFC) and safety standards for the storage, dispensing and use of hazardous materials required for research facilities using hazardous materials as well as state and federal regulations and best business practices.

Building 70 contains 62,237 GSF of space of which approximately 38,000 NSF is research laboratory area. Building modifications will include the separation of various types of research activities which require individualized control areas and safeguards as well as improved separations of normal laboratory-office occupancies. The separations will include new walls, doors, door frames and proper penetration seals. Also, vertical shafts will be upgraded to meet required separations for wall penetrations.

A separate chemical delivery system will be provided consisting of exterior walkways and vertical dumbwaiter in order to separate delivery of hazardous materials from exit corridors used by occupants. An exterior walkway will be constructed on the southwall of the building to provide chemical deliveries to laboratories within the building. These delivery routes will be "dedicated" chemical delivery corridors and not used as a means of ingress/egress for the Building. An internally situated dumbwaiter (serviced from the exterior) will connect the chemical delivery walkways and be accessible from the 1st floor loading dock level of the building.

Additional exits will be provided from laboratories which do not currently have a second means of egress.

The ventilation system will be upgraded to meet new code requirements and mitigate hazards throughout the building. This will include increased capacities for airflow chilled water and the heating system.

Electrical systems will also be upgraded to mitigate health and safety hazards throughout the building. The emergency power system will be upgraded to meet the requirements of NFPA 110, Level 1 operations. A central supervised monitoring and alarm system will be provided for monitoring hazardous materials. Emergency egress lighting will be provided in laboratories and corridors as required by ANSI Standard 446-1987, Chapter 3, Table 1.

PROJECT DATA SHEETS

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1. Title and location of project: Hazardous Materials Safeguards, Phase I      2. Project No.: 93-E-324  
Lawrence Berkeley Laboratory  
Berkeley, California

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8. Brief Physical Description of Project (Continued)

These improvements to existing government-owned facilities will be located on land owned by the University of California and will serve or be operated in conjunction with other government-owned facilities at Lawrence Berkeley Laboratory (LBL).

9. Purpose, Justification of Need and Scope of Project

The existing Building 70 is an aged laboratory facility used for materials sciences and semi-conductor research which are pertinent to the programs of Materials and Chemical Sciences, Nuclear Science, High Energy Physics, and Health and Environmental Research. These operations employ a wide variation of chemicals and gases which are flammable and/or toxic. The current configuration and distribution of research activities in Building 70 makes it impractical to apply operational and passive safeguards recently incorporated in the 1988 Uniform Building and Fire Codes and various new state and federal regulations governing the use of hazardous materials in research activities. Major building and building systems renovations are required to meet new standards for safeguarding health, safety and the environment.

If this project is not funded, research operations at the existing facility must be restricted, thus either seriously curtailing and/or eliminating LBL operations in these fields of research entirely.

PROJECT DATA SHEETS

1. Title and location of project: Hazardous Materials Safeguards, Phase I      2. Project No.: 93-E-324  
 Lawrence Berkeley Laboratory  
 Berkeley, California

<u>10. Details of Cost Estimate</u> <u>a/</u>	<u>Item Costs</u>	<u>Total Cost</u>
a.(1) Engineering, design, and inspection at approximately 17% of construction costs, Items b.1,2.....		\$    610
(2) Construction management at approximately 3% of construction costs.....		100
b. Construction costs.....		3,730
(1) Buildings.....	3,510	
(2) Removals.....	90	
(3) Project Management (3.6% of Construction Costs, Items b.1,2).....	130	
Subtotal.....		<u>4,440</u>
c. Contingency at approximately 15% of above costs.....		660
Total estimated construction cost (TECC) .....		<u>\$ 5,100</u>

a/      Costs have been escalated at, 3.6% for FY 1991, 4.5% for FY 1992, 5.1% for FY 1993, and 5.6% for FY 1994; compounded to the midpoint of construction, August 1994 for a total of 18.5%.

Conceptual design is complete.  
 PED requirements: None.

11. Method of Performance

Engineering design will be performed under a negotiated architect-engineer subcontract after a Pre-Title I survey and report for the facility has been prepared by a qualified chemical consultant. Inspection and some engineering may 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.

PROJECT DATA SHEETS

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1. Title and location of project: Hazardous Materials Safeguards, Phase I      2. Project No.: 93-E-324  
 Lawrence Berkeley Laboratory  
 Berkeley, California

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

	<u>Prior Yrs</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>	<u>Total</u>
a. Total project costs (TPC)					
(1) Total facility costs					
(a) Construction line item.....	\$ 0	\$ 500	\$ 2,300	\$ 2,300	\$ 5,100
Total facility costs.....	\$ 0	\$ 500	\$ 2,300	\$ 2,300	\$ 5,100
b. Total related funding requirements					
(2) Operating Expenses (Conceptual Design).....	\$ 60	\$ 0	\$ 0	\$ 0	\$ 60

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

- a. Total project funding
- (1) Total facility  
       The major elements of the Building 70 Rehabilitation have been described in Item 8.
- b. Total related funding requirements
- (1) Operating Expenses Related to this Facility  
       Conceptual Design was accomplished in FY 1991.  
       Programs already exist that will be using this facility.

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MULTIPROGRAM ENERGY LABORATORIES - TIGER TEAM REMEDIATIONS  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Fire and Safety Systems Upgrade, Phase I Lawrence Berkeley Laboratory Berkeley, California	2. Project No.: 93-E-323
3a. Date A-E work initiated (Title I design start scheduled): 2nd Qtr FY 1993	5. Previous construction cost estimate: None
3b. A-E work (Titles I & II) duration: 28 months	
4a. Date physical construction starts: 2nd Qtr FY 1994	6. Current construction cost estimate: \$4,600 TECC: \$4,600 Date: January 1992
4b. Date construction ends: 3rd Qtr FY 1996	

<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$ 1,500	\$ 1,500	\$ 500
	1994	2,000	2,000	1,200
	1995	1,100	1,100	1,600
	1996	0	0	1,300

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

## PROJECT DATA SHEETS

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1. Title and location of project: Fire and Safety Systems Upgrade, Phase I  
Lawrence Berkeley Laboratory  
Berkeley, California

2. Project No.: 93-E-323

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### 8. Brief Physical Description of Project

The 1989 Technical Safety Appraisal (TSA) identified Lawrence Berkeley Laboratory (LBL) facilities that were not in compliance with the Uniform Building Code, Uniform Fire Code, NFPA 101 Life Safety Code, NFPA 80 Fire Doors and Windows, NFPA 13 Installation of Sprinkler Systems, NFPA 14 Standpipe and Hose System, NFPA 72 Installation Maintenance and Use of Protective Signaling Systems, and DOE Order 5480.7 Fire Protection Improved Risk Program. This project is the first of several projects which will bring LBL facilities in compliance with recent building, fire and life safety codes. Corrective measures resulting from a facility-wide fire protection engineering survey will be prioritized and incorporated in the project. In general, some or all of the following modifications will be made where deficiencies exist:

- o Repair or replace fire rated assemblies which include fire rated doors, fire/smoke dampers, fire stopping at through-wall penetrations and patching of openings in wall and floors to provide integrity of the fire rated barriers.
- o Provide fire rated wall assemblies for occupancy separation as a result of change in use from the original building design.
- o Provide required number of exits per NFPA 101, the Uniform Building Code, and the Uniform Fire Code.
- o Retrofit exit doors with proper hardware.
- o Replace door latches which will not open in the event of a fire due to the pressure differences on both sides of the door.
- o Provide additional exit signs in areas per the requirements of NFPA 101 where the exits are not obvious.
- o Provide adequate exit lighting and emergency lighting per the requirements of NFPA 101.
- o Relocate and add automatic sprinklers in areas where the existing systems do not conform to the requirements of NFPA 13, e.g., under wood structures in Building 51B and the platform in Building 52.

## PROJECT DATA SHEETS

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1. Title and location of project: Fire and Safety Systems Upgrade, Phase I      2. Project No.: 93-E-323  
Lawrence Berkeley Laboratory  
Berkeley, California

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### 8. Brief Physical Description of Project (Continued)

- o Provide heat detectors and/or smoke detectors in addition to automatic sprinklers in areas where redundant systems are warranted due to the high replacement values and mission criticality of the facilities.
- o Repair and upgrade fire alarm systems to ensure the audibility is adequate to warn occupants in the event of fire including workers working on the roof.
- o Remove and replace excess combustibile construction in exit corridors, e.g., non fire retardant treated wood used as pipe supports and abandoned nonplenum rated telephone/electrical cables in the spaces above the corridor ceiling.
- o Provide flammable/combustible liquid storage cabinets.
- o If buildings where exiting deficiencies cannot be upgraded in a practical and/or a cost effective manner, upgrade supply air and exhaust systems to make provisions for incorporation of smoke control systems in the future.

These improvements to existing government-owned facilities will be located on land owned by the University of California and will serve or be operated in conjunction with other government-owned facilities at LBL.

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

Facilities at LBL were largely constructed from the 1940s to the mid 1960s and provided national scientific leadership during a historically significant period of high energy and nuclear physics research. Building design, including installation of fire protection systems, was based upon the applicable building and fire codes and intended occupancy at the time of construction. During this period, major changes occurred in the building, fire, and life safety codes. Furthermore, the conversion of LBL to a multiprogram research facility necessitated reassignment of space for different occupancies than originally intended. While sprinklers have been installed in most facilities, modifications are required to meet new codes and correct noncompliance conditions. Adequate compartmentalization (fire barriers) to prevent fire spread in some facilities does not exist. Fire alarm systems are inadequate in providing early warning signals to occupants in parts of these

PROJECT DATA SHEETS

1. Title and location of project: Fire and Safety Systems Upgrade, Phase I  
Lawrence Berkeley Laboratory  
Berkeley, California

2. Project No.: 93-E-323

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

buildings. Fire resistive ratings of the exit corridors have been comprised by through-wall penetrations and nonrated fire assemblies. Dead end corridors exceed the distance permitted by applicable codes, creating life safety hazards. Exit doors are not provided or have been replaced with hardware which does not conform to applicable codes.

10. Details of Cost Estimate a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. (1) Engineering, design, and inspection at approximately 17% of construction costs, Item b.1.....		\$ 540
(2) Construction management at approximately 3% of construction costs.....		100
b. Construction costs.....		3,310
(1) Buildings.....	3,200	
(2) Project Management (3% of Construction costs, Item b1).....	110	
Subtotal.....		<u>3,950</u>
c. Contingency at approximately 17% of above costs.....		<u>650</u>
Total estimated construction costs (TECC).....		\$ 4,600

a/ Costs have been escalated at, 3.6% for FY 1991, 4.5% for FY 1992, 5.1% for FY 1993, 5.6% for FY 1994, and 5.7% for FY 1995; compounded to the midpoint of construction, September 1994 for Subcontract A, for a total of 19%, and November, 1995 for Subcontract B for a total of 27.2%.

Conceptual design is complete.  
PED requirements: None.

11. Method of Performance

Design will be accomplished on basis of a negotiated architect-engineer contract. Construction and procurement will be accomplished by fixed price contracts awarded on basis of competitive bidding.

PROJECT DATA SHEETS

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1. Title and location of project: Fire and Safety Systems Upgrade, Phase I      2. Project No.: 93-E-323  
Lawrence Berkeley Laboratory  
Berkeley, California

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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  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
PROJECT DATA SHEETS  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
MULTIPROGRAM ENERGY LABORATORIES - TIGER TEAM REMEDIATIONS  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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1. Title and Location of Project: Fire and Safety Improvements, Phase II  
 Argonne National Laboratory  
 Argonne, Illinois

2. Project No.: 93-E-320

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3a. Date A-E work initiated, (Title I design start scheduled): 2nd Qtr FY 1993

3b. A-E work (Title I & II) duration: 18 months

4a. Date physical construction starts: 4th Quarter FY 1994

4b. Date construction ends: 4th Quarter FY 1996

5. Previous construction cost estimate: None

6. Current construction cost estimate: \$5,350  
 TECC: \$5,350  
 TPC: \$5,462  
 Date: January 1992

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<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	1993	1,870	1,870	470
	1994	2,000	2,000	1,700
	1995	1,480	1,480	1,870
	1996	0	0	1,310

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

PROJECT DATA SHEETS

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1. Title and Location of Project: Fire and Safety Improvements, Phase II      2. Project No.: 93-E-320  
Argonne National Laboratory  
Argonne, Illinois

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8. Brief Physical Description of Project

a. General Description

ANL management began its current review of its fire protection systems in 1985 with a Factory Mutual study which recommended improvements in the most critical areas. These recommendations formed the basis for the first phase of ANL's Fire Safety Upgrade program, the 1992 line item funding request "Fire Safety Improvements," which is currently included in the FY 1992 budget. This project, Phase II, is a continuation of those improvements.

The Phase II of the Fire Safety Improvements project will encompass fire protection system extensions, new installations, and system replacement in 80 existing ANL-E buildings. The project can be grouped into three areas:

1. Fire suppression system improvement
2. Fire detection and fire alarm system improvements
3. Construction for fire protection

This project will complete the upgrading of existing fire alarm and suppression systems and expand fire suppression systems to cover areas requiring protection as per current DOE orders.

b. Fire Suppression System Improvements

Of the 80 buildings identified for improvements, 26 require installation or modification of fire suppression systems, and 18 of the 26 buildings will require both alarm/detection as stated in Item 8.c. and suppression system installations.

66 carbon dioxide fire suppression systems with radioactive exhaust fume hoods will be replaced.

The antifreeze solution fire suppression systems for protection of cooling towers or other unheated areas will be converted to dry-pipe sprinkler systems.

PROJECT DATA SHEETS

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1. Title and Location of Project: Fire and Safety Improvements, Phase II Argonne National Laboratory Argonne, Illinois	2. Project No.: 93-E-320
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8. Brief Physical Description of Project (Continued)

c. Fire Detection and Fire Alarm System Improvements

63 building require fire detection and alarm systems replacement.

d. Construction for Fire Protection

A new 8-inch underground water main will be installed east of Building 202 to provide a loop around the building.

Fire separation construction will be improved to meet required fire separation ratings for computer rooms per DOE/EP-0108 in three buildings.

9. Purpose, Justification of Need and Scope of Project

a. General

This project's funding request timetable, originally scheduled to begin in the mid 1990s, has been accelerated due to the recent DOE Tiger Team Assessment.

This project was approved as part of ANL's 1990 Action Plan developed in response to DOE Tiger Team findings.

1. Finding No. FP.2-2 of the Tiger Team Assessment Section 4.5.18 "Fire Protection" states that the requirements for emergency alarms, as detailed in NFPA 72 and mandated by DOE 5480.4, are not met at ANL Facilities. Action Plan item AP294 responding to this finding, states that line item funding will be requested for site wide building fire alarm system upgrading.
2. Finding No. FP.4-1 of the Tiger Team Assessment Section 4.5.18 "Fire Protection" states that automatic fire suppression systems are not provided throughout ANL facilities as required by DOE 5480.7. Action Plan item AP25 responding to this finding, states that ANL will request funding to upgrade those areas of ANL not in compliance.

PROJECT DATA SHEETS

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1. Title and Location of Project: Fire and Safety Improvements, Phase II      2. Project No.: 93-E-320  
Argonne National Laboratory  
Argonne, Illinois

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

The action plan milestones dictate complete implementation of the fire alarm upgrades by 1996 and fire suppression upgrades by 1997. This project's schedule, as proposed, will meet these milestones.

b. Fire Detection and Alarm System Improvements:

The existing systems in the 63 identified buildings are 25-30 years old. These systems have numerous shortcomings:

1. They are near or at capacity, thereby prohibiting expansion for occupancy changes or building additions.
2. The components are no longer manufactured or sold.
3. Smoke detectors cannot be installed where preferred over the use of heat detectors since some systems will not accommodate smoke detectors. This can result in slower detection in areas with high value electronics and computer systems.
4. Many of the systems do not meet current National Fire Protection Association Standards.
5. The existing and aging fire alarm systems are 220V DC. The existing fire alarm panels have unprotected, hot 220V terminals, exposed to personnel contact during routine maintenance or inspection. This poses a threat of minor to serious injury. The new systems proposed are of reduced voltage, 24 V DC, significantly reducing any change of personal injury to very low or rare levels.
6. Reliability of the existing systems has decreased which results in an increased number of false alarms and failures to report alarms.
7. A number of existing smoke detectors installed in several buildings at ANL contain detector elements fabricated from Radium Sulfate (Radium 226). Although these sources produce less than 1 Rem/yr. exposure levels, ANL's "ALARA" program dictates the removal of these detectors. Proposed smoke detectors use Americium 241 and have an emittance level several orders of magnitude lower than Radium 226. This significantly reduces possible exposure levels to building occupants and alarm system maintenance personnel.

PROJECT DATA SHEETS

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1. Title and Location of Project: Fire and Safety Improvements, Phase II      2. Project No.: 93-E-320  
Argonne National Laboratory  
Argonne, Illinois

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

8. This project will allow ANL to utilize new and improved technologies in fire protection. New low voltage addressable fire alarm systems will allow more accurate communication of a fire condition to building occupants and the ANL Fire Department. This will reduce Fire Department response time, improve reliability, and improve the Fire Department's ability to locate the actual fire area.

c. Fire Suppression System Improvements:

1. The purpose of this part of Phase II of the Fire Safety Improvements Project is to complete the progress of selected buildings towards the "Improved Risk" concept as defined in DOE Order 5480.7 Fire Protection. That order established objectives for an "improved risk" level of fire protection which are applicable throughout its facilities. Objectives are as follows:

- a. No threats to the public health or welfare will result from fire.
- b. There are no undue hazards to employees from fire.
- c. Vital Department of Energy programs will not suffer unacceptable delays as a result of fire.
- d. Property damage will be held to manageable levels as defined in DOE Order 5480.7.

2. Automatic Sprinkler Systems:

Automatic fire protection systems shall be provided in Buildings 24, 40, 108, 129, 368, 377 and 583 as the maximum possible fire loss is in the range of 1 to 25 million dollars, so that property damage is limited to \$1 million or less in either case.

Automatic fire protection systems shall be provided in 19 buildings to keep property damage at manageable levels, and eliminate any hazards to life from fire. A number of these 19 buildings have some portions of the buildings protected with suppression systems at this time.

As programmatic needs change with time, facility fire alarm systems and fire suppression systems must provide adequate protection for the research and scientific programs. Major DOE initiatives could be affected due to facility shutdowns resulting from lack of required fire sprinkler and alarm systems. National Fire Protection Codes mandate that all facilities modified for new programs must also have their fire protection systems upgraded to meet current code requirements for existing facilities.

PROJECT DATA SHEETS

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1. Title and Location of Project: Fire and Safety Improvements, Phase II      2. Project No.: 93-E-320  
Argonne National Laboratory  
Argonne, Illinois

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

The modifications proposed herein will remedy the identified risks to the Laboratory's program, personnel, and physical plant.

3. Antifreeze Suppression Systems:

Existing antifreeze filled fire suppression systems pose a concern to the environment and increase waste management costs. Maintenance of these systems require draining the antifreeze and using appropriate waste management procedures to dispose of the solution. Leaks, breaks in a system or activation of an antifreeze system poses potential environmental hazards from the discharged antifreeze. Replacement of these systems with dry pipe type suppression systems will remove this potential hazard.

The antifreeze solution sprinkler systems protecting cooling towers and unheated storage buildings are required to have reduced pressure zone backflow preventers to comply with Section 890.1540 of the State of Illinois Plumbing Code. The reduced pressure zone backflow preventers are required to prevent the antifreeze solution from contaminating the potable water supply. Installation of reduced pressure zone backflow preventers on these systems is undesirable because of the pressure loss (approximately 10 psi) encountered through the device, rendering the system ineffective against fires. In addition, water from the relief valves on these devices cannot be readily discharged to drain in these areas. To eliminate the need for reduced pressure zone backflow preventers, the antifreeze systems will be converted to dry-pipe sprinkler systems.

4. Carbon Dioxide Suppression Systems

Sixty-five new carbon dioxide fire suppression systems are required to protect glove boxes, hoods, and other areas in Buildings 200, 203, 205, 211, 213 and 360 to replace existing systems which are antiquated and unreliable. The existing systems are not electrically supervised nor equipped with standby power. The majority of the heat detectors which activate these systems are corroded and may not be operable.

The existing carbon dioxide system protecting the kitchen hoods in Building 213 will be replaced by a wet chemical fire extinguishing system. A wet chemical system is more appropriate for this hazard to control re-ignition of a fire. As this building is heavily occupied during kitchen use, maximum protection should be provided to prevent any undue loss of life or property.



PROJECT DATA SHEETS

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1. Title and Location of Project: Fire and Safety Improvements, Phase II 2. Project No.: 93-E-320  
 Argonne National Laboratory  
 Argonne, Illinois

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10. Details of Cost Estimate a/

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection @ approximately 12% of construction costs, item b.....		\$ 462
b. Construction management @ approximately 4% of construction costs, item b.....		150
c. Project management @ approximately 2.5% of construction costs, item b.....		94
d. Construction costs.....		3,750
(1) Fire suppression systems.....	\$1,993	
(2) Fire detection and alarm systems.....	1,688	
(3) Construction for Fire Protection.....	69	
Subtotal.....		<u>\$4,456</u>
e. Contingency @ approximately 20% of above costs.....		<u>894</u>
Total estimated construction cost (TECC).....		<u>\$5,350</u>

a/ The above estimates are based upon a completed conceptual design and current cost data. All costs have been escalated from January 1991 to the midpoint of construction. Escalation rate is based upon DOE FY 1992 Guidance dated August 1990: FY 1991 - 3.6%, FY 1992 - 4.5%, FY 1993 - 5.1%, FY 1994 - 5.6%, and FY 1995 - 5.7% and FY 1996 - 5.7%.

11. Method of Performance

Engineering and design will be performed under a negotiated A/E contract with guidance, review and monitoring by Laboratory personnel. Inspection will be performed by Laboratory personnel aided by the A/E firm. Construction management and project management will be performed by Laboratory personnel. Construction will be accomplished by fixed-price lump sum contract(s) awarded on the basis of competitive bidding.

PROJECT DATA SHEETS

1. Title and Location of Project: Fire and Safety Improvements, Phase II Argonne National Laboratory Argonne, Illinois	2. Project No.: 93-E-320
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12. Funding Schedule of Project Funding and Other Related Funding Requirements

	<u>Prior</u>	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>Total</u>
	<u>Years</u>							
a. Total project costs (TPC)								
1. Total project costs								
(a) Construction line item.(TECC)	\$ 0	\$ 0	\$ 0	\$ 470	\$1,700	\$ 1,870	\$ 1,310	\$ 5,350
Total direct costs.....	\$ 0	\$ 0	\$ 0	\$ 470	\$1,700	\$ 1,870	\$ 1,310	\$ 5,350
2. Other project costs								
(a) Conceptual design costs.....	\$ 0	\$ 97	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 97
(b) Documentation costs.....	0	15	0	0	0	0	0	15
Total other project costs.	\$ 0	\$ 112	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 112
Total project costs (items 1 & 2)....	\$90	\$ 112	\$ 0	\$ 470	\$1,700	\$ 1,870	\$ 1,310	\$ 5,462
b. Other related annual costs								
None.								

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
2. Other project funding
- (a) A conceptual design was completed by an outside Fire Protection Engineering firm.
- (b) Documentation costs include preparation of project data sheets, design reviews, and Environmental Evaluation Notification Form (DOE - CH560).

b. Other related annual costs

Operating costs will be reduced as the new system components require less maintenance than the previous fire alarm system. Expansion of fire suppression system will not require any increase in maintenance personnel. No additional costs are expected.

DEPARTMENT OF ENERGY  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
PROJECT DATA SHEETS  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
MULTIPROGRAM ENERGY LABORATORIES - TIGER TEAM REMEDIATIONS  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Life Safety Code Compliance Pacific Northwest Laboratory Richland, Washington	2. Project No.: 93-E-317
3a. Date A-E work initiated (Title I design start scheduled): 2nd Qtr FY 1993	5. Previous cost construction estimate: None
3b. A-E work (Titles I & II) duration: 10 months	
4a. Date physical construction starts: 1st Qtr FY 1994	6. Current construction cost estimate: \$2,300
4b. Date construction ends: 3rd Qtr FY 1995	TECC: \$2,300 TPC: \$2,330 Date: January 1992

7. <u>Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$ 1,000	\$ 1,000	500
	1994	1,300	1,300	1,050
	1995	0	0	750

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

## PROJECT DATA SHEETS

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1. Title and location of project: Life Safety Code Compliance  
Pacific Northwest Laboratory (PNL)  
Richland, Washington

2. Project No.: 93-E-317

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### 8. Brief Physical Description of Project

This project will provide upgrades to selected 300 area PNL multi-program facilities. These modifications will mitigate known deficiencies to current requirements of the Life Safety Code, the National Fire Protection Association Code and DOE Order 6430.1A as they apply to existing facilities. The facilities included in this project are the Life Sciences Laboratory (331); the Technical Management Center (337); the Materials Development Laboratory (306W); and the Chemistry and Metals Science Laboratory (3720).

Design and construction activities will be necessary to correct the deficiencies associated with these facilities. Included in this work are modifications to firewalls, fire doors, vertical openings, exit corridors and egress pathways. Also included is the renovation of the 331 Building elevators.

The 306W work will include fire wall modifications to the east wall of Room 152, modifications to Room 119 to provide space for a hand and shoe counter in order to move the counter out of the corridor, and modification of the copier area to relocate the copier out of the egress corridor.

Modifications to the 331 Building will consist of numerous modifications on all three floors. The first floor lobby area will be provided with additional fire separations and doors. Eight doors and fifteen fire rated partitions have been identified as having unsealed, empty holes, pipe conduit, and duct penetrations to be repaired. The second floor Mechanical Room has approximately 577 ceiling and floor penetrations to be sealed. The existing elevators will be completely upgraded with a new shaft, fluids, cab and entry doors to meet current standards.

The 337 Building is composed of three open bay floors with interconnecting stairwells and a lobby area on the second floor for a primary exit. The main stairway and lobby area is not presently separated from the office wings by a complete fire wall assembly meeting requirements of the Life Safety Code and Uniform Building Code (UBC). Presently, nine areas have been identified for remodeling to bring the building into compliance.

PROJECT DATA SHEETS

1. Title and location of project: Life Safety Code Compliance  
Pacific Northwest Laboratory (PNL)  
Richland, Washington

2. Project No.: 93-E-317

8. Brief Physical Description of Project (Continued)

Presently, the use of hand and shoe counters are located in the corridors of 3720. These locations are in violation of the Life Safety Code since they are in the path of egress from the building. New alcoves will be provided to remove counters from corridors. These counters are located in three places; in the basement, in the intersection of corridors 200 and 500, and at the east end of corridor 500.

9. Purpose, Justification of Need and Scope of Project

The purpose of this project is to ensure continuity of operations in vital multiprogram laboratories at PNL. Department of Energy Order 6430.1A requires facilities to comply with the requirements of NFPA 101, Life Safety Code.

The Life Safety Code (National Fire Protection Association Standard #101) specifies how buildings must be arranged and constructed to protect occupants in the event of the need for evacuation because of fire or other emergency situations. DOE Order 480.4B "Environmental Protection Safety and Health Protection Standards" and DOE Order 6430.1A, "General Design Criteria" mandate that DOE facilities must comply with requirements of this code. The code violations cause significant concern and correction of these violations are mitigated by this project.

The code's scope addresses hazards to life safety from fire and similar emergencies. It also addresses those construction protection and occupancy features necessary to minimize hazards to life from fire, smoke, fumes, or panic. The code identifies the minimum criteria for the design of egress facilities so as to permit prompt escape of occupants from buildings, or where desirable, into safe areas within the building. The code also applies to both new construction and existing buildings. Failure to comply with the Life Safety Code jeopardizes the safety of staff members and visitors if emergency evacuation of a facility is needed. Violations to the Life Safety Code are continuing and facility shutdown is possible. In addition, upgrading of the fire walls to meet Life Safety Codes requirements will also help reduce potential property loss due to fire.

PROJECT DATA SHEETS

1. Title and location of project: Life Safety Code Compliance Pacific Northwest Laboratory (PNL) Richland, Washington	2. Project No.: 93-E-317
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9. Purpose, Justification of Need and Scope of Project (Continued)

The current condition of these buildings has raised many concerns about their adequacy to continuing operations. The PNL research missions can be continued by completing the work proposed in this project. This project also corrects Tiger Team priority 3 deficiencies addressed in TS.3-2.

10. Details of Cost Estimate a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. (1) Engineering, design, and inspection at approximately 23% of construction costs, Item b.....		\$ 460
(2) Construction management.....		40
b. Construction costs.....		1,300
(1) Buildings.....	\$ 1,300	
Subtotal.....		<u>1,800</u>
c. Contingency at approximately 28% of above costs.....		<u>500</u>
Total estimated construction cost (TECC).....		\$ 2,300 <u>b/</u>

a/ The above estimates are based on completed conceptual design.

b/ Material and labor rates have been escalated to 1991 dollars using the conversion method and index found in the Department of Energy Material and Labor Escalation Study for Richland Operations Office, FY 1991, Appendix 1, page 12.

PROJECT DATA SHEETS

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1. Title and location of project: Life Safety Code Compliance  
Pacific Northwest Laboratory (PNL)  
Richland, Washington

2. Project No.: 93-E-317

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11. Method of Performance

Design will be accomplished on basis of a negotiated architect-engineer contract. Construction and procurement will be accomplished by the onsite CPAF construction 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  
FY 1993 CONGRESSIONAL BUDGET REQUEST  
PROJECT DATA SHEETS  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
MULTIPROGRAM ENERGY LABORATORIES - TIGER TEAM REMEDIATIONS  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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- |  |   |
|--|---|
| 1. Title and location of project: Roof Replacement, Phase I<br>Brookhaven National Laboratory<br>Upton, New York | 2. Project No. 93-E-315   |
| 3a. Date A-E initiated, (Title I design start scheduled): 1st Qtr FY 1993  | 5. Previous construction cost estimate: None  |
| 3b. A-E work (Title I & II) duration: 6 months   |   |
| 4a. Date physical construction starts: 3rd Qtr FY 1993   | 6. Current construction cost estimate: \$3,130<br>TECC: \$3,130<br>TPC: \$3,130<br>Date: January 1992 |
| 4b. Date construction ends: 4th Qtr FY 1995  |   |

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<u>7. Financial Schedule</u>	<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Obligations</u>	<u>Costs</u>
	FY 1993	\$1,130	\$1,130	\$ 850
	FY 1994	2,000	2,000	1,280
	FY 1995	0	0	1,000

a/ Outyear amounts reflect funding levels higher than amounts contained in the OMB passback. The funding of these outyear requirements will be addressed in the next budget cycle.

PROJECT DATA SHEETS

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1. Title and location of project: Roof Replacement, Phase I  
 Brookhaven National Laboratory  
 Upton, New York

2. Project No. 93-E-315

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8. Brief Physical Description of Project

This proposal provides for the roof replacement on 13 buildings. Approximately 385,000 sq. ft. of re-roofing for permanent structures will be accomplished in this phase. Existing roofs and wet insulation will be removed. Deteriorated and or rusted metal decks will be repaired or replaced. Built up roofing system or mechanically fastened single-ply system suitable to the existing conditions will be installed.

9. Purpose, Justification of Need and Scope of Project

Roofs of primary structures totaling 1,859,200 sq. ft. were surveyed in 1989 by BNL consultants. The roofs were rated from failed to good. Forty-six roofs totaling 1,195,500 sq. ft. were further investigated and core samples from these roofs were analyzed. Life expectancy of each roof was calculated based on Laboratory core sample data, infrared thermography moisture detection surveys, and severity of roof conditions. Sixty percent of roof area of 46 buildings is in poor or failed conditions and replacement in the next 5 years is required.

10. Details of Cost Estimate a/

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at approximately 7% of construction costs, Item b.....		\$ 185
b. Construction costs.....		2,660
(1) Removal of existing roofs.....	\$ 770	
(2) Roof insulation.....	625	
(3) Re-roofing.....	1,265	
Subtotal.....		<u>2,845</u>
c. Contingency at approximately 10% of above costs.....		<u>285</u>
Total estimated construction costs (TECC).....		\$3,130

a/ This estimate is based on Conceptual Design Report dated January 1990. Escalation rates used were taken from DOE Departmental Price Change Index - FY 92 Guidance, August 1990 Update.

PROJECT DATA SHEETS

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1. Title and location of project: Roof Replacement, Phase I  
Brookhaven National Laboratory  
Upton, New York

2. Project No. 93-E-315

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11. Method of Performance

Roof replacement design will be on the basis of a 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.