

DEPARTMENT OF ENERGY  
FY 1994 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT

OVERVIEW

MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT

Attaining the R&D goals articulated in the Energy Policy Act of 1992 (EPACT) involves significant use of the Energy Research (ER) laboratories. 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 program dedicated ER laboratories. All facilities at these laboratories are government owned and have an estimated replacement cost of over \$10 billion dollars. The average age of the laboratories' facilities is 30 years and plans indicate that these laboratories will be heavily utilized by DOE programs throughout the 1990's and well into the 21st century.

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. The Multiprogram Energy Laboratories-Facilities Support (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, environmentally responsible, and productive manner; (2) reduce the backlog of facility deficiencies; (3) address Tiger Team identified Environment, Safety and Health (ES&H) remediation needs; (4) remove inactive general purpose facilities that are surplus to current and planned operations and costly to maintain, and (5) clean-up contaminated portions of general purpose facilities and maintain and prepare for transfer to the Office of Environmental Restoration and Waste Management (EM) appropriate contaminated general purpose facilities (GPF) for decontamination and decommissioning (D&D).

The MEL-FS program is composed of three subprograms. The General Purpose Facilities (GPF) subprogram provides construction support for the rehabilitation and replacement of the GPF at the ER laboratories. These construction projects have a total estimated cost (TEC) of \$1.2 million or above and are directed at GPF which include general use, service and support facilities such as administrative space, general office/laboratory space, utility systems, sanitary sewers, roads, etc. This subprogram also begins implementation of an infrastructure replacement and upgrade initiative in response to the Secretary's emphasis on modernizing the Department's aging infrastructure, reducing the large backlog of deficiencies and improving project management. For the first time, \$700,000 is requested in operating funds to support new planning and management oversight activities related to this effort. These include implementing and operating the Condition Assessment Survey and Capital Assets Management Process (CAMP), improved maintenance and an integrated multiyear capital investment plan and project management system for ER's infrastructure support program.

The Tiger Team Remediation subprogram is an on-going activity that provides support necessary to correct general ES&H deficiencies identified in Tiger Team assessments of ER laboratories. Correcting these deficiencies that have accumulated over many years represents a significant burden to current laboratory budgets. In addition, a comprehensive across-the-complex ES&H performance review is now underway. The costs of complying with more stringent laws, regulations and orders are currently being developed. This program helps relieve the increased burden on current laboratory research budgets while providing effective Headquarters oversight of these ES&H activities. The oversight role allows the Office of Energy Research to develop and implement initiatives across the laboratories to speed compliance with new requirements and practices.

Operating funds are requested for the first time under the Tiger Team Remediation subprogram. These funds will support the highest priority compliance-related corrective actions related to Tiger Team and other ES&H reviews such as upgrades to radiological assistance programs, improvements to hazards assessment plans, upgrades to emergency operations center systems, air toxics compliance activities, upgrades to maintenance programs, upgrades to chemical monitoring systems and Occupational Safety and Health Administration (OSHA) items such as crane compliance, additional eyewash/safety showers and chemical and gas storage improvements. The program will also initiate an activity to proactively address the highest priority cross-laboratory ES&H issues such as identifying and transferring "noteworthy practices" and promoting needed process improvements in high priority areas such as construction safety.

The Inactive and Surplus Facilities subprogram is a new activity that will provide resources to better manage the large number of retired, inactive and contaminated general purpose facilities at ER laboratories prior to their final removal or transfer to EM for D&D. The largest ER

Overview - MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT (Cont'd)

laboratories date back to the 1940's and have many facilities that have outlived their usefulness. These facilities can not be economically maintained or renovated to house current or planned activities and must be retired. In addition, portions of some operating facilities may be inactive due to contamination and must be cleaned-up. Those contaminated facilities that qualify for clean-up by EM will be maintained and prepared for transfer in accordance with established criteria. The backlog of activities within ER to be funded by this program is estimated to be \$250 million.

The benefits to be gained from supporting the program are: improved laboratory safety, security and environmental compliance levels; reduced health risks; decreased operating costs and improved productivity; and continuity of operations. The program also provides continuity and a broad basis for establishing overall laboratory infrastructure needs and priorities. The program helps ensure that the laboratories' infrastructure is adequate for the continued effective accomplishment of the Department's research and development (R&D) missions today and in the future. The program represents the Department's commitment to responsible management of the Government's real property.

The program's request also includes funding for ER's landlord responsibilities at ORNL and Oak Ridge Institute for Science and Education (ORISE). In FY 1992 and FY 1993, under an interim arrangement, the landlord funding responsibility for ORNL was carried by EM. With the FY 1994 budget, the landlord responsibility reverts back to ER. Starting with this budget, landlord funding requirements for ORISE is transferred to this program. Funding is requested for General Plant Projects (GPP) and General Purpose Equipment (GPE).

**DEPARTMENT OF ENERGY**  
**FY 1994 CONGRESSIONAL BUDGET REQUEST**  
**ENERGY SUPPLY, RESEARCH AND DEVELOPMENT**  
(Tabular dollars in thousands narrative in whole dollars)

**LEAD TABLE**

**Multiprogram Energy Laboratories - Facilities Support**

<u>Activity</u>	<u>FY 1992 Adjusted</u>	<u>FY 1993 Appropriation</u>	<u>FY 1993 Adjustment</u>	<u>FY 1994 Request</u>
<b>Operating Expenses</b>				
General Purpose Facilities .....	\$0	\$0	\$0	\$700
Tiger Team Remediations .....	0	0	0	623
Inactive and Surplus Facilities.....	0	0	0	500
Subtotal Operating Expenses.....	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$1,823</u>
<b>Capital Equipment</b>				
General Purpose Facilities .....	\$0	\$0	\$0	\$6,000
Tiger Team Remediations .....	0	3,000	-2,500 a/	500
Subtotal Capital Equipment.....	<u>\$0</u>	<u>\$3,000</u>	<u>-\$2,500</u>	<u>\$6,500</u>
<b>Construction</b>				
General Purpose Facilities .....	\$25,591	\$56,700	-\$34,340 b/	\$27,489
Tiger Team Remediations .....	0	7,000	-3,850 a/	5,776
Subtotal Construction.....	<u>\$25,591</u>	<u>\$63,700</u>	<u>-\$38,190</u>	<u>\$33,265</u>
Subtotal, Multiprogram Energy Laboratories -Facilities Support.....	\$25,591	\$66,700	-\$40,690	\$41,588
Adjustment.....	0	-40,000 a/	40,000 a/	0
<b>TOTAL.....</b>	<u><u>\$25,591</u></u>	<u><u>\$26,700</u></u>	<u><u>-\$690</u></u>	<u><u>\$41,588</u></u>
<b>Summary</b>				
Operating Expenses.....	\$0	\$0	\$0	\$1,823
Capital Equipment .....	0	500	0	6,500
Construction .....	25,591	26,200	-690	33,265
<b>Total Program.....</b>	<u><u>\$25,591</u></u>	<u><u>\$26,700</u></u>	<u><u>-\$690</u></u>	<u><u>\$41,588</u></u>

**Authorizations:**

P.L. 95-91, "Department of Energy Organization Act" (1977), Section 647

a/ Program specific general reduction.

b/ Program specific general reduction of \$33,650,000 and general reduction of \$690,000 for use of prior year balances.

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SUMMARY OF CHANGES

Multiprogram Energy Laboratories - Facilities Support

FY 1993 Appropriation .....	\$ 66,700
- Adjustment - Program specific general reduction.....	- 40,000
- Adjustment- General reduction for use of prior year balances.....	<u>- 690</u>
FY 1993 Adjusted .....	\$ 26,010
- Supports infrastructure planning and management activities and improvements to program/ project support systems.....	+ 700
- Supports most critical and highest priority corrective actions related to Tiger Team and other ES&H reviews.....	+ 623
- Provides support for cleanup or removal of inactive and surplus facilities.....	+ 500
- Provides support for landlord responsibilities at Oak Ridge National Laboratory and Oak Ridge Institute for Science and Education.....	+ 15,000
- Supports continuation/completion of on-going Tiger Team projects.....	+ 2,626
- Supports continuation/completion of ongoing GPF projects and initiation of new GPF projects.....	<u>- 3,871</u>
FY 1994 Congressional Budget Request.....	<u>\$ 41,588</u>

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KEY ACTIVITY SUMMARY

MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT

I. Preface: General Purpose Facilities

The program requests operating funds to support the planning and management activities related to this effort. Funding would support implementation and operation of the DOE Condition Assessment Survey and Capital Assets Management Process and the new DOE Maintenance Order; the preparation of an integrated multi-year capital investment plan for general purpose facilities at ER laboratories; extraordinary laboratory costs in preparing project proposals and a project management system for tracking projects underway.

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 1992 Enacted	FY 1993 Enacted	FY 1994 Request	% Change
Operating Expenses.....	\$ 0	\$ 0	\$ 700	>999
Total, General Purpose Facilities	\$ 0	\$ 0	\$ 700	>999

II. B. Major Laboratory and Facility Funding

ARGONNE NATIONAL LABORATORY (EAST) .....	\$ 0	\$ 0	\$ 50	>999
BROOKHAVEN NATIONAL LABORATORY .....	\$ 0	\$ 0	\$ 50	>999
LAWRENCE BERKELEY LABORATORY .....	\$ 0	\$ 0	\$ 50	>999
OAK RIDGE NATIONAL LABORATORY .....	\$ 0	\$ 0	\$ 50	>999
PACIFIC NORTHWEST LABORATORY .....	\$ 0	\$ 0	\$ 30	>999

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

Program Activity	FY 1992	FY 1993	FY 1994
<b>General Purpose Facilities</b>			
Operating Expenses	No activity.	No activity.	Supports infrastructure planning and management activities, such as support for developing and implementing the DOE Condition Assessment Survey and Capital Assets Management Process, and the new DOE Maintenance Order. Also supports improvements to program/project support systems such as the Project Control and Status System.
	No activity.	No activity.	Development of tools such as management information systems and architectural and engineering contractor support to aid in the preparation of a facility policy and plan for the multiprogram energy laboratories as required by Section 2203(d) of the Energy Policy Act of 1992.
	\$ 0	\$ 0	\$ 700
<b>General Purpose Facilities</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 700</b>

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KEY ACTIVITY SUMMARY

MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT

I. Preface: Tiger Team Remediations

The Department has undertaken a uniform comprehensive review of ES&H compliance of its facilities. The Tiger Team Reviews which constituted the initial phase have now been completed. The results indicate numerous deficiencies that are to be corrected over a multi-year period. Subsequent follow-up reviews of ES&H performance are now underway. Additional deficiencies are emerging from these new reviews as laws, regulations and DOE ES&H Orders ensure adherence to new ES&H standards and expectations. Key weaknesses and deficiencies identified in the reviews are related to occupational safety and health, fire protection, emergency preparedness, safety/hazards analyses, conduct of operations, configuration management, work practices and radiation protection.

Correcting deficiencies that have accumulated over many years and that are a result of new laws, regulations and DOE Orders represents a significant burden on current laboratory research budgets. This program helps relieve the increased burden on current laboratory budgets while providing effective Headquarters oversight of these efforts. This oversight role allows the program to proactively address ES&H concerns across ER laboratories such as transferring "note worthy practices" and "lessons learned" between laboratories.

Operating funds are requested for the first time under the Tiger Team Remediations subprogram. These funds will support the highest priority compliance-related corrective actions related to Tiger Team and other ES&H reviews such as upgrades to radiological assistance programs, improvements to hazards assessment plans, upgrades to emergency operations center systems, air toxics compliance activities, upgrades to maintenance programs, upgrades to chemical monitoring systems and OSHA items such as crane compliance, additional eyewash/safety showers and chemical and gas storage improvements. The program will also initiate an activity to proactively address the highest priority cross-laboratory ES&H issues such as identifying and transferring "noteworthy practices" and promoting needed process improvements in high priority areas such as construction safety.

II. A. Summary Table: Tiger Team Remediations

Program Activity	FY 1992 Enacted	FY 1993 Enacted	FY 1994 Request	% Change
Operating Expenses.....	\$ 0	\$ 0	\$ 623	>999
Total, Tiger Team Remediations	\$ 0	\$ 0	\$ 623	>999

II. B. Major Laboratory and Facility Funding

ARGONNE NATIONAL LABORATORY (EAST) .....	\$ 0	\$ 0	\$ 100	>999
BROOKHAVEN NATIONAL LABORATORY .....	\$ 0	\$ 0	\$ 100	>999
LAWRENCE BERKELEY LABORATORY .....	\$ 0	\$ 0	\$ 100	>999
OAK RIDGE NATIONAL LABORATORY .....	\$ 0	\$ 0	\$ 200	>999
PACIFIC NORTHWEST LABORATORY .....	\$ 0	\$ 0	\$ 50	>999

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

Program Activity	FY 1992	FY 1993	FY 1994
<b>Tiger Team Remediations</b>			
Operating Expenses	No activity.	No activity.	Supports the most critical and very highest priority corrective actions related to Tiger Team and other ES&H reviews. Examples are: upgrades to radiological assistance programs, improvements to hazards assessment plans, upgrades to emergency operations center systems, air toxics compliance activities, upgrades to maintenance programs, upgrades to chemical monitoring systems and OSHA items such as crane compliance, additional eyewash/safety showers and chemical & gas storage improvements. (\$550) The program will also initiate an activity to proactively address the highest priority cross-laboratory ES&H issues such as identifying and transferring "noteworthy practices" and promoting needed process improvements in high priority areas such as construction safety. (\$73)
	\$ 0	\$ 0	\$ 623
<b>Tiger Team Remediations</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 623</b>



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KEY ACTIVITY SUMMARY

MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT

I. Preface: Inactive and Surplus Facilities

It is the policy of the Department to maintain only those facilities necessary to effectively and economically perform assigned missions and tasks. Over the course of time, as research programs grow and shrink and technologies change, some existing general purpose facilities (or portions of them) have become permanently inactive. These facilities must be cleaned-up if they are to be reused, or removed if they are determined to be surplus. They represent a significant operating burden to the laboratories due to loss of potentially useful space and the continuing requirement for surveillance and maintenance. The facilities also represent an ES&H liability. The Inactive and Surplus Facilities subprogram is designed to modify and/or dispose of these facilities in a comprehensive and systematic manner.

Three categories of facilities are planned for inclusion in the subprogram:

- inactive/retired facilities that cannot be economically maintained or renovated to house current or planned activities and must be removed.
- areas of operating facilities that are inactive due to discontinued activities and must be cleaned-up for re-use due to operational and liability concerns.
- contaminated facilities that qualify for clean-up by EM will be maintained as required and prepared for transfer to EM.

The backlog of activities to be funded by this program is estimated to be \$250 million. The benefits to be gained by supporting this program are: reduced operating cost; reduced ES&H liabilities; reduced requirements for new space; and, better utilization of the site.

II. A. Summary Table: Inactive and Surplus Facilities

Program Activity	FY 1992 Enacted	FY 1993 Enacted	FY 1994 Request	% Change
Operating Expenses.....	\$ 0	\$ 0	\$ 500	>999
Total, Inactive and Surplus Facilities	\$ 0	\$ 0	\$ 500	>999

II. B. Major Laboratory and Facility Funding

BROOKHAVEN NATIONAL LABORATORY .....	\$ 0	\$ 0	\$ 100	>999
OAK RIDGE NATIONAL LABORATORY .....	\$ 0	\$ 0	\$ 300	>999
PACIFIC NORTHWEST LABORATORY .....	\$ 0	\$ 0	\$ 100	>999

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

Program Activity	FY 1992	FY 1993	FY 1994
<b>Inactive and Surplus Facilities</b>			
Operating Expenses	No activity.	No activity.	Provides support to determine clean-up/demolition/transfer requirements for high priority facilities; preparatory work to transfer those contaminated facilities that EM will accept; and removal and/or clean-up of selected inactive surplus facilities that cannot be transferred to EM.
	\$ 0	\$ 0	\$ 500
<b>Inactive and Surplus Facilities</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 500</b>

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MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT

I. Preface: General Purpose Facilities

This subprogram provides funding for ER's landlord responsibilities at ORNL and ORISE. In FY 1992 and FY 1993, under an interim arrangement, the landlord funding responsibility for ORNL was carried by EM. With FY 1994 budget, the landlord responsibility reverts back to ER with this budget. Landlord funding responsibility for ORISE is transferred from the Biological and Environmental Research program to the MEL-FS program. Funding for \$5,950,000 is requested for GPE at ORNL and \$50,000 for GPE at ORISE.

II. A. Summary Table: General Purpose Facilities

Program Activity	FY 1992 Enacted	FY 1993 Enacted	FY 1994 Request	% Change
Capital Equipment.....	\$ 0	\$ 0	\$ 6,000	>999
Total, General Purpose Facilities	\$ 0	\$ 0	\$ 6,000	>999

II. B. Major Laboratory and Facility Funding

OAK RIDGE NATIONAL LABORATORY .....	\$ 0	\$ 0	\$ 5,950	>999
OAK RIDGE INSTITUTE FOR SCIENCE & EDUCATION .....	\$ 0	\$ 0	\$ 50	>999

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

Program Activity	FY 1992	FY 1993	FY 1994
<b>General Purpose Facilities-</b>			
Capital Equipment	No activity.	No activity.	Provides GPE funding for ER's landlord responsibilities at ORNL and ORISE. (\$6,000)
	\$ 0	\$ 0	\$ 6,000
<b>General Purpose Facilities</b>			
	\$ 0	\$ 0	\$ 6,000

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MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT

I. Preface: Tiger Team Remediations

The Department has undertaken a uniform comprehensive review of ES&H compliance of its facilities. The Tiger Team Reviews which constituted the initial phase have now been completed. The results indicate numerous deficiencies that are to be corrected over a multi-year period. Subsequent follow-up reviews of ES&H performance are now underway. Additional deficiencies are emerging from these new reviews as laws, regulations and DOE ES&H Orders ensure adherence to new ES&H standards and expectations. Key weaknesses and deficiencies identified in the reviews are related to occupational safety and health, fire protection, emergency preparedness, safety/hazards analyses, conduct of operations, configuration management, work practices and radiation protection.

Correcting deficiencies that have accumulated over many years and that are a result of new laws, regulations and DOE Orders represents a significant burden on current laboratory research budgets. This program helps support the increased burden on current laboratory budgets while providing effective Headquarters oversight of these efforts. This oversight role allows the program to proactively address ES&H concerns across ER laboratories such as transferring "noteworthy practices" and "lessons learned" between laboratories.

Capital funds for general purpose equipment are a major component of the program. These investments in tools and facilities are needed to correct ES&H deficiencies and to implement current ES&H requirements. This program is essential to providing support to lighten the heavy burden of the ES&H compliance legacy on the laboratories' current research budget and allows an integrated, timely, and effective response to identified needs.

II. A. Summary Table: Tiger Team Remediations

Program Activity	FY 1992 Enacted	FY 1993 Enacted	FY 1994 Request	% Change
Capital Equipment.....	\$ 0	\$ 500	\$ 500	0
Total, Tiger Team Remediations	\$ 0	\$ 500	\$ 500	0

II. B. Major Laboratory and Facility Funding

ARGONNE NATIONAL LABORATORY (EAST) .....	\$ 0	\$ 75	\$ 75	0
BROOKHAVEN NATIONAL LABORATORY .....	\$ 0	\$ 75	\$ 75	0
LAWRENCE BERKELEY LABORATORY .....	\$ 0	\$ 100	\$ 100	0
OAK RIDGE NATIONAL LABORATORY .....	\$ 0	\$ 200	\$ 200	0
PACIFIC NORTHWEST LABORATORY .....	\$ 0	\$ 50	\$ 50	0

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

Program Activity	FY 1992	FY 1993	FY 1994
<b>Tiger Team Remediations</b>			
Capital Equipment	No activity.	Provides 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 equipment is required to comply with findings of the Tiger Team reviews.	Continue to provide modern ES&H equipment as identified in Action Plans.
	\$ 0	\$ 500	\$ 500
<b>Tiger Team Remediations</b>	\$ 0	\$ 500	\$ 500

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KEY ACTIVITY SUMMARY

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I. Preface: General Purpose Facilities

The program funds line-item construction projects (i.e., projects with a total estimated cost of \$1.2 million or above) that correct deficiencies in general purpose facilities at ER Multiprogram National laboratories. This subprogram was established in FY 1981 and contributes to infrastructure improvements at all ER laboratories.

Projects funded under this program are general use, service and support facilities such as administrative space, cafeterias, general office/laboratory space, utility systems, sanitary sewers, roads, etc. Support is coordinated with ER landlord programs that fund GPP (i.e., construction projects with a TEC estimated at \$1.2 million or less) at these laboratories. Capital investment requirements are identified in laboratory Institutional Plans and Site Development Plans which addresses planned needs 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 over the five year period.

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.

This program also provides funding for ER's landlord responsibilities ORNL and ORISE. In FY 1992 and FY 1993, under an interim arrangement, the landlord funding responsibility for ORNL was carried by EM. With the FY 1994 budget, the landlord responsibility reverts back to ER. The landlord funding responsibility for ORISE has been transferred from ER's Biological and Environmental Research program to the MEL-FS program with this budget. Funding of \$8,750,000 is requested for GPP at ORNL and \$250,000 for GPP at ORISE.

II. A. Summary Table: General Purpose Facilities

Program Activity	FY 1992 Enacted	FY 1993 Enacted	FY 1994 Request	% Change
Construction.....	\$ 25,591	\$ 22,360	\$ 27,489	+ 23
Total, General Purpose Facilities	\$ 25,591	\$ 22,360	\$ 27,489	+ 23

II. B. Major Laboratory and Facility Funding

AMES LABORATORY .....	\$ 1,500	\$ 1,557	\$ 0	-100
ARGONNE NATIONAL LABORATORY (EAST) .....	\$ 4,014	\$ 4,447	\$ 4,220	- 5
BROOKHAVEN NATIONAL LABORATORY .....	\$ 4,539	\$ 3,562	\$ 3,017	- 15
LAWRENCE BERKELEY LABORATORY .....	\$ 11,046	\$ 4,303	\$ 3,259	- 24
OAK RIDGE INSTITUTE FOR SCIENCE & EDUCATION .....	\$ 0	\$ 0	\$ 250	>999
OAK RIDGE NATIONAL LABORATORY .....	\$ 2,792	\$ 5,891	\$ 14,743	+150
PACIFIC NORTHWEST LABORATORY .....	\$ 1,700	\$ 2,600	\$ 2,000	- 23

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

Program Activity	FY 1992	FY 1993	FY 1994
<b>General Purpose Facilities</b>			
<b>Construction</b>	Supported the completion/continuation of 10 ongoing projects (\$13,245) consistent with planned schedules and initiated of 9 projects - 2 building rehabs, 1 building replacement, 1 fire safety and 5 utility projects. (\$12,346)	Supports the completion/continuation of ongoing projects consistent with planned schedules and initiation of new projects to continue modernization of infrastructure and reduction of the substantial backlog of facilities deficiencies. (\$22,360)	Supports completion/continuation of ongoing projects consistent with planned schedules and initiation of new projects including utility and building rehab/upgrade projects. (\$18,489)
	No activity.	No activity.	Supports GPP funding for landlord responsibilities at ORNL. (\$8,750) Supports GPP funding for landlord responsibilities at ORISE. (\$250)
	\$ 25,591	\$ 22,360	\$ 27,489
<b>General Purpose Facilities</b>	\$ 25,591	\$ 22,360	\$ 27,489



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I. Preface: Tiger Team Remediations

The Department has undertaken a uniform comprehensive review of ES&H compliance of its facilities. The Tiger Team Reviews which constituted the initial phase have now been completed. The results indicate numerous deficiencies that are to be corrected over a multi-year period. Subsequent follow-up reviews of ES&H performance are now underway. Additional deficiencies are emerging from these new reviews as laws, regulations and DOE ES&H Orders ensure adherence to new ES&H standards and expectations. Key weaknesses and deficiencies identified in the reviews are related to occupational safety and health, fire protection, emergency preparedness, safety/hazards analyses, conduct of operations, configurations management, work practices and radiation protection.

Correcting deficiencies that have accumulated over many years and that are a result of new laws, regulations and DOE Orders represents a significant burden on current laboratory research budgets. This program helps support the increased burden on current laboratory budgets while providing effective Headquarters oversight of these efforts. This oversight role allows the program to proactively address ES&H concerns across ER laboratories such as transferring "noteworthy practices" and "lessons learned" between laboratories.

II. A. Summary Table: Tiger Team Remediations

Program Activity	FY 1992 Enacted	FY 1993 Enacted	FY 1994 Request	% Change
Construction.....	\$ 0	\$ 3,150	\$ 5,776	+ 83
Total, Tiger Team Remediations	\$ 0	\$ 3,150	\$ 5,776	+ 83

II. B. Major Laboratory and Facility Funding

ARGONNE NATIONAL LABORATORY (EAST) .....	\$ 0	\$ 850	\$ 850	0
BROOKHAVEN NATIONAL LABORATORY .....	\$ 0	\$ 800	\$ 1,926	+141
LAWRENCE BERKELEY LABORATORY .....	\$ 0	\$ 1,000	\$ 2,000	+100
PACIFIC NORTHWEST LABORATORY .....	\$ 0	\$ 500	\$ 1,000	+100

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

Program Activity	FY 1992	FY 1993	FY 1994
<b>Tiger Team Remediations</b>			
Construction	No activity.	Supports initiation of new projects to address Tiger Team corrective actions including fire safety projects, a roof replacement project, a safety code compliance project and a hazardous materials safeguard project.	Supports completion/continuation of the on-going projects consistent with planned schedules.
	\$ 0	\$ 3,150	\$ 5,776
<b>Tiger Team Remediations</b>	<b>\$ 0</b>	<b>\$ 3,150</b>	<b>\$ 5,776</b>

**DEPARTMENT OF ENERGY**  
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(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

**ENERGY SUPPLY, RESEARCH AND DEVELOPMENT**  
(Tabular dollars in thousands. Narrative material in whole dollars.)

**IV. A. Construction Funded Project Summary**

<u>Project No.</u>	<u>Project Title</u>	<u>Previous Obligations</u>	<u>FY 1993 Appropriated</u>	<u>FY 1993 Proposed Reallocation of Gen. Red.</u>	<u>FY 1994 a/ Request</u>	<u>Unappropriated a/ Balance</u>	<u>TEC</u>
<b><u>Multiprogram Energy Laboratories - General Purpose Facilities</u></b>							
GPE-801	General Plant Projects, Various Locations	\$0	\$0	\$0	\$9,000	\$0	\$9,000
94-E-363 b/	Roofing Improvements (ORNL)	0	0	0	3,300	12,700	16,000
94-E-351	Fuel Storage and Transfer Facility (BNL)	0	0	0	1,000	2,850	3,850
93-E-332	Materials Handling Center (BNL)	0	300	0	0	3,420	3,420
93-E-328	Central Research & Support Building (ORNL)	0	1,500	0	0	12,800	12,800
93-E-327	Safety/Support Services Facility (LBL)	0	1,224	0	0	9,900	9,900
93-E-326	Laboratory Addition - Building 205 (ANL)	0	620	0	0	5,750	5,750
93-E-325	Potable Water System Upgrade - Phase I (BNL)	0	700	1,500	2,017	1,863	5,380
93-E-316	Underground Power & Communication System I (BNL)	0	800	0	0	3,600	3,600
93-E-313	Electrical System Upgrade - Phase II (ANL)	0	600	1,000	2,150	1,950	5,100
92-E-329	Electrical Substation Upgrade (ANL)	500	2,110	2,400	2,070	0	4,970
92-E-328	Program Support Facility (AMES)	4,483	1,557	1,557	0	0	6,040

a/ FY 1994 Request and Unappropriated Balance reflect FY 1993 Proposed Reallocation of General Reduction.

b/ Formerly 93-E-329. To accommodate FY 1993 appropriation, this project was delayed until FY 1994.

<u>Project No.</u>	<u>Project Title</u>	<u>Previous Obligations</u>	<u>FY 1993 Appropriated</u>	<u>FY 1993 Proposed Reallocation of Gen. Red.</u>	<u>FY 1994 a/ Request</u>	<u>Unappropriated a/ Balance</u>	<u>TEC</u>
<b><u>Multiprogram Energy Laboratories - General Purpose Facilities (Continued)</u></b>							
92-E-324	Safety Compliance Modifications, 326 Bldg. (PNL)	1,700	3,000	3,000	2,000	1,700	8,400
92-E-323	Upgrade Steam Distribution System - West End (ORNL)	1,080	3,527	5,227	2,693	0	9,000
92-E-322	East Canyon Electrical Safety Project (LBL)	425	907	907	1,568	1,000	3,900
92-E-321	Fire Safety Improvements (ANL)	603	1,117	1,117	0	0	1,720
92-E-312	Roof Replacement (LBL)	2,000	500	500	0	0	2,500
92-E-309	Sanitary Systems Modifications (BNL)	1,238	1,762	2,822	0	0	4,060
91-E-323	Building 90 Seismic Rehabilitation (LBL)	6,378	422	422	0	0	6,800
90-R-112	Measurements & Controls Support Facility (ORNL)	4,266	464	464	0	0	4,730
88-R-806	Environmental Health and Safety Project (LBL)	9,672	1,250	1,800	1,691	0	13,163
Subtotal Multiprogram Energy Laboratories - General Purpose Facilities Construction		\$32,345	\$22,360	\$22,716	\$27,489	\$57,533	\$140,083

a/ FY 1994 Request and Unappropriated Balance reflect FY 1993 Proposed Reallocation of General Reduction.

<u>Project No.</u>	<u>Project Title</u>	<u>Previous Obligations</u>	<u>FY 1993 Appropriated</u>	<u>FY 1993 Proposed Reallocation of Gen. Red.</u>	<u>FY 1994 a/ Request</u>	<u>Unappropriated a/ 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	500	500	1,000	3,600	5,100
93-E-323	Fire and Safety Systems Upgrade, Phase I (LBL)	0	500	500	1,000	3,100	4,600
93-E-320	Fire and Safety Improvements, Phase II (ANL)	0	850	390	850	4,110	5,350
93-E-317	Life Safety Code Compliance (PNL)	0	500	500	1,000	900	2,400
93-E-315	Roof Replacement, Phase I (BNL)	0	800	904	1,926	300	3,130
<b>Subtotal, Multiprogram Energy Laboratories - Tiger Team Remediation Construction</b>		<b>\$0</b>	<b>\$3,150</b>	<b>\$2,794</b>	<b>\$5,776</b>	<b>\$12,010</b>	<b>\$20,580</b>
<b>Total Multiprogram Energy Laboratories - Facilities Support Construction</b>		<b><u>\$32,345</u></b>	<b><u>\$25,510</u> c/</b>	<b><u>\$25,510</u> c/</b>	<b><u>\$33,265</u></b>	<b><u>\$69,543</u></b>	<b><u>\$160,663</u></b>

a/ FY 1994 Request and Unappropriated Balance reflect FY 1993 Proposed Reallocation of General Reduction.

c/ Total reflects the application of a portion (\$31,176,000) of the FY 1993 programmatic general reduction of \$40,000,000. Balance of this \$40,000,000 reduction (\$8,824,000) was applied to FY 1993 new starts that have been deleted and to capital equipment. Also reflects a portion (\$690,000) of the FY 1993 Energy Supply R&D general reduction of \$104,300,000 for use of prior year balances.

**IV. B. Construction Funded Project Descriptive Summary**

1. **Project Title and Location:** Project GPE-801 General Plant Projects TEC: \$ 9,000  
 Various Locations TPC: \$ 9,000

Start Date: 2nd Qtr. FY 1994      Completion Date: 4th Qtr. FY 1994

2. **Financial Schedule:**

<u>Fiscal Year</u>	<u>Obligations</u>	<u>Costs</u>			
		<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>After FY 1994</u>
FY 1994 Projects	\$ 9,000	\$ 0	\$ 0	\$ 7,000	\$ 2,000

3. **Narrative:** This project is required to support landlord responsibilities at Oak Ridge National Laboratory (ORNL) and Oak Ridge Institute for Science and Education (ORISE). The estimate is for minor new construction and other capital alterations to land, buildings and utilities systems. The estimate also includes the cost of installed equipment which is an integral part of the general plant subprojects. Since it is difficult to identify particular projects in advance, a continuing evaluation of requirements and priorities may result in additions, deletions and changes in the currently planned subprojects.

The current estimate is \$8,750,000 for Oak Ridge National Laboratory and \$250,000 Oak Ridge Institute for Science and Education. The estimate is for minor new construction which will contribute to greater efficiency, eliminate health and safety hazards and reduce maintenance and operational costs. The total estimated cost of each project will not exceed \$1,200,000.

4. <b>Total Project Funding (B/A):</b>	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 9,000

IV. B. Construction Funded Project Descriptive Summary

1. Project Title and Location: Project 94-E-363, Roofing Improvements  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee

TEC: \$ 16,000  
TPC: \$ 16,120

Start Date: 2nd Qtr. FY 1994 Completion Date: 4th Qtr. FY 1997

2. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$4,024	-4,024 a/	\$ 0	\$ 0
1994	3,300	0	3,300	1,500
1995	3,700	0	3,700	4,500
1996	5,000	0	5,000	4,500
1997	4,000	0	4,000	5,000
1998	0	0	0	500

a/ This project was proposed as an FY 1993 new start (93-E-329). Application of a portion (-\$4,024,000) of the FY 1993 programmatic general reduction of \$40,000,000 necessitated a delay in the start of this project to FY 1994.

3. Narrative: Due to budgetary constraints, the start of this project was delayed from FY 1993 (Project No. 93-E-329) to FY 1994 resulting in an attendant increase in TEC and TPC. The TEC has been increased from \$15,000,000 to \$16,000,000. The TPC has been increased from \$15,070,000 to \$16,120,000.

This project supports replacement of deteriorated roofing on buildings and facilities throughout ORNL. Requirements are prioritized and those in the worst condition and housing the most critical equipment and activities will have the highest priority.

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.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 3,300	\$ 12,700
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	120	0	0	0	0

IV. B. Construction Funded Project Descriptive Summary

1. Project Title and Location: Project 94-E-351 Fuel Storage and Transfer Facility Upgrade  
 Brookhaven National Laboratory  
 Upton, New York

TEC: \$ 3,850  
 TPC: \$ 3,900

Start Date: 4th Qtr. FY 1994 Completion Date: 1st Qtr. FY 1996

2. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
1994	\$1,000	\$1,000	\$ 800
1995	2,850	2,850	2,616
1996	0	0	434

3. Narrative: This project will upgrade the existing fuel storage and transfer facility to bring it into compliance with local and state code for handling and storage of fuel oil.

This facility will consist of fuel transfer facility enclosure with unloading booms and fire detection and protection systems. This facility will be constructed on a diked containment area equipped with leak detection systems and oil/water separator. The enclosure will be approximately 5,600 square feet.

4. Total Project Funding (BA):

	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 0	\$ 1,000	\$ 2,850
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	50	0	0	0	0



IV. B. Construction Funded Project Descriptive Summary

1. Project Title and Location: Project 93-E-325, Potable Water System Upgrade - Phase I  
 Brookhaven National Laboratory  
 Upton, New York  
 TEC: \$ 5,380  
 TPC: \$ 5,380

Start Date: 4th Qtr. FY 1993 Completion Date: 4th Qtr. FY 1995

2. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Proposed Reallocation of General Reduction</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 3,500	-2,800 a/	+800 b/	\$1,500	\$ 600
1994	2,017	0	0	2,017	2,700
1995	1,863	0	0	1,863	2,080

a/ Application of a portion of the FY 1993 programmatic general reduction of \$40,000,000.

b/ Proposed reallocation of FY 1993 general reduction to make project funding consistent with requested resources in FY 1994.

3. Narrative: Due to budgetary constraints, this project has been stretched out from the 4th quarter of FY 1994 to the 4th quarter of FY 1995 resulting in an attendant increase in TEC and TPC. The TEC and TPC have been increased from \$5,250,000 to \$5,380,000.

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.

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.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 1,500	\$ 2,017	\$ 1,863
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

IV. B. Construction Funded Project Descriptive Summary

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

TEC: \$ 5,100  
 TPC: \$ 5,259

Start Date: 2nd Qtr. FY 1994      Completion Date: 4th Qtr. FY 1995

2. Financial schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Proposed Reallocation of General Reduction</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 3,000	-2,400 <u>a/</u>	+400 <u>b/</u>	\$1,000	\$ 500
1994	2,150	0	0	2,150	2,000
1995	1,950	0	0	1,950	2,100
1996	0	0	0	0	500

a/ Application of a portion of the FY 1993 programmatic general reduction of \$40,000,000.

b/ Proposed reallocation of FY 1993 general reduction to make project funding consistent with requested resources in FY 1994.

3. Narrative: The project supports the upgrade of the main electrical distribution system and major components in the 200 area.

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.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 1,000	\$ 2,150	\$ 1,950
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	159	0	0	0	0

**IV. B. Construction Funded Project Descriptive Summary**

**1. Project Title and Location:** Project 92-E-329, Electrical Substation Upgrade  
 Argonne National Laboratory  
 Argonne, Illinois TEC: \$ 4,970  
 TPC: \$ 4,970

Start Date: 3rd Qtr. FY 1993      Completion Date: 4th Qtr. FY 1994

**2. Financial Schedule:**

<u>Fiscal Year</u>	<u>Appropriated</u>	<u>Adjustments</u>	<u>Proposed Reallocation of General Reduction</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$ 500	0	0	\$ 500	\$ 91
1993	4,470	-2,360 a/	+290 b/	2,400	2,000
1994	2,070	0	0	2,070	2,570
1995	0	0	0	0	309

a/ Application of a portion (-\$2,070,000) of the FY 1993 programmatic general reduction of \$40,000,000, and a portion (-\$290,000) of the FY 1993 Energy Supply R&D general reduction of \$104,300,000 for use of prior year balances.

b/ Proposed reallocation of FY 1993 general reduction to make project funding consistent with requested resources in FY 1994.

**3. Narrative:** The project provides for the upgrade of the main electrical substation at Facility 549.

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.

<b>4. Total Project Funding (BA):</b>	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 500	\$ 2,400	\$ 2,070	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

IV. B. Construction Funded Project Descriptive Summary

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

TEC: \$ 8,400  
TPC: \$ 8,760

Start Date: 3rd Qtr. FY 1993 Completion Date: 4th Qtr. FY 1995

2. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$1,700	0	\$1,700	\$ 489
1993	6,000	-3,000 <sup>a/</sup>	3,000	2,500
1994	2,000	0	2,000	2,000
1995	1,700	0	1,700	1,911
1996	0	0	0	1,500

<sup>a/</sup> Application of a portion of the FY 1995 programmatic general reduction of \$40,000,000.

3. Narrative: Due to budgetary constraints this project has been stretched out from the 1st quarter of FY 1994 to the 4th quarter of FY 1995. The TPC has increased from \$8,520,000 to \$8,760,000 to cover other project related costs estimated at \$240,000.

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.

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.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 1,700	\$ 3,000	\$ 2,000	\$ 1,700
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	140	50	60	60	50

IV. B. Construction Funded Project Descriptive Summary

1. Project Title and Location: Project 92-E-323 Upgrade Steam Distribution System - West End TEC: \$ 9,000  
 Oak Ridge National Laboratory TPC: \$ 9,130  
 Oak Ridge, Tennessee

Start Date: 1st Qtr. FY 1993 Completion Date: 4th Qtr. FY 1995

2. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustment</u>	<u>Proposed Reallocation of General Reduction</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$1,080	0	0	\$1,080	\$ 604
1993	5,607	- 2,080 a/	+1,700 b/	5,227	3,300
1994	2,693	0	0	2,693	3,700
1995	0	0	0	0	1,396

a/ Application of a portion (-\$1,680,000) of the FY 1993 programmatic general reduction of \$40,000,000, and a portion (-\$400,000) of the FY 1993 Energy Supply R&D general reduction of \$104,300,000 for use of prior year balances.

b/ Proposed reallocation of FY 1993 general reduction to make project funding consistent with requested resources in FY 1994.

3. Narrative: 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.

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.

Increased FY 1994 funding is required to compensate for FY 1993 reduction so that the project schedule can be maintained.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 1,080	\$ 5,227	\$ 2,693	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	130	0	0	0	0

**IV. B. Construction Funded Project Descriptive Summary**

**1. Project Title and Location:** Project 92-E-322 East Canyon Electrical Safety Project  
Lawrence Berkeley Laboratory  
Berkeley, California

TEC: \$ 3,900  
TPC: \$ 3,940

Start Date: 2nd Qtr. FY 1994 Completion Date: 4th Qtr. FY 1995

**2. Financial Schedule:**

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$ 377	+48 a/	\$ 425	\$ 19
1993	1,507	-600 b/	907	581
1994	1,568	0	1,568	1,000
1995	1,000	0	1,000	1,400
1996	0	0	0	900

a/ Includes internal reprogramming from closed-out projects (87-R-753 - \$9,000; 88-R-807 - \$ 5,000; 90-R-107 - \$ 17,725; 90-R-108 - \$8,000; 90-R-113 - \$8,000).

b/ Application of a portion of the FY 1993 programmatic general reduction of \$40,000,000.

**3. Narrative:** 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.

The existing 12kV power system has major deficiencies. There is no redundancy, so 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.

<b>4. Total Project Funding (BA):</b>	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 425	\$ 907	\$ 1,568	\$ 1,000
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	40	0	0	0	0

**IV. B. Construction Funded Project Descriptive Summary**

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

TEC: \$ 13,163  
 TPC: \$ 13,225

Start Date: 2nd Qtr. FY 1988      Completion Date: 4th Qtr. FY 1995

2. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Proposed Reallocation of General Reduction</u>	<u>Obligations</u>	<u>Costs</u>
1988	-\$ 850	0	0	\$ 850	\$ 59
1989	3,448	-1,019 a/	0	2,429	1,090
1990	3,250	+1,060 a/	0	4,310	172
1991	2,777	-1,203 a/	0	1,574	891
1992	9	+ 500 b/	0	509	2,070
1993	1,500	- 250 c/	+ 550 d/	1,800	4,000
1994	1,691	0	0	1,691	3,930
1995	0	0	0	0	951

- a/ Portion of this project was transferred to Office of Environmental Restoration and Waste Management (EM) necessitating a change in funding profile; also an internal reprogramming of funds from closed-out projects (83-E-308, 83-E-311, 81-E-309, 81-E-318 and 81-E-325) was approved.
- b/ Internal reprogramming from 92-E-312 to continue project and comply with Tiger Team recommendations.
- c/ Application of a portion (-\$250,000) of the FY 1993 programmatic general reduction of \$40,000,000.
- d/ Proposed reallocation of FY 1993 general reduction to make project funding consistent with requested resources in FY 1994.

3. Narrative: TEC increase in FY 1992 from \$9,163,000 to \$13,163,000 due to need to perform ventilation system improvements while laboratory space was occupied and due to uniform fire code changes with respect to storage of flammable materials in dispensing drums.

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.

Equipment, controls and facilities are old, deteriorated and in need of upgrading or replacement in order to comply with applicable standards.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 9,163	\$ 509	\$ 1,800	\$ 1,691	\$ 0
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	41	21	0	0	0

IV. B. Construction Funded Project Descriptive Summary

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

TEC: \$ 5,100  
 TPC: \$ 5,160

Start Date: 3rd Qtr. FY 1994 Completion Date: 2nd Qtr. FY 1996

2. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 1,500	-1,000 <u>a/</u>	\$ 500	\$ 400
1994	1,000	0	1,000	900
1995	3,600	0	3,600	2,100
1996	0	0	0	1,700

a/ Application of a portion of the FY 1993 programmatic general reduction of \$40,000,000.

3. Narrative: Due to budgetary constraints, this project has been stretched out from the 2nd quarter of FY 1995 to the 2nd quarter of FY 1996.

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.

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.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 500	\$ 1,000	\$ 3,600
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	60	0	0	0	0



IV. B. Construction Funded Project Descriptive Summary

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

TEC: \$ 4,600  
 TPC: \$ 4,630

Start Date: 2nd Qtr. FY 1994      Completion Date: 3rd Qtr. FY 1997

2. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 1,500	-1,000 <u>a/</u>	\$ 500	\$ 400
1994	1,000	0	1,000	900
1995	2,000	0	2,000	1,200
1996	1,100	0	1,100	1,600
1997	0	0	0	500

a/ Application of a portion of the FY 1993 programmatic general reduction of \$40,000,000.

3. Narrative: Due to budgetary constraints, this project has been stretched out from the 3rd quarter of FY 1996 to the 3rd quarter FY 1997.

This project is the first of several which will bring LBL facilities into compliance with building, fire and life safety codes.

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.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 500	\$ 1,000	\$ 3,100
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	30	0	0	0	0

IV. B. Construction Funded Project Descriptive Summary

1. Project Title and Location: Project 93-E-320, Fire and Safety Improvements - Phase II  
 Argonne National Laboratory  
 Argonne, Illinois  
 TEC: \$ 5,350  
 TPC: \$ 5,462

Start Date: 4th Qtr. FY 1994 Completion Date: 4th Qtr. FY 1996

2. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Proposed Reallocation of General Reduction</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 1,870	-1,020 a/	- 460 b/	\$ 390	\$ 100
1994	850	0	0	850	700
1995	2,110	0	0	2,110	1,600
1996	2,000	0	0	2,000	1,650
1997	0	0	0	0	1,300

a/ Application of a portion of the FY 1993 programmatic general reduction of \$40,000,000.

b/ Proposed reallocation of FY 1993 general reduction to make project funding consistent with requested resources in FY 1994.

3. Narrative: This project supports Phase II of required fire safety improvements at ANL.

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

4. Total Project Funding (BA):

	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 390	\$ 850	\$ 4,110
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	112	0	0	0	0

IV. B. Construction Funded Project Description Summary

1. Project Title and Location: Project 93-E-317, Life Safety Code Compliance TEC: \$ 2,400  
 Pacific Northwest Laboratory TPC: \$ 2,550  
 Richland, Washington

Start Date: 1st Qtr. FY 1994 Completion Date: 3rd Qtr. FY 1995

2. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 1,000	-500 a/	\$ 500	\$ 400
1994	1,000	0	1,000	750
1995	900	0	900	900
1996	0	0	0	350

a/ Application of a portion of the FY 1993 programmatic general reduction of \$40,000,000.

3. Narrative: Due to budgetary constraints, TEC increased from \$2,300,000 to \$2,400,000 and TPC increased from \$2,330,000 to \$2,550,000.

This project supports upgrades to selected 300 area PNL multiprogram facilities. These upgrades will correct deficiencies in fire and life safety codes.

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.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 500	\$ 1,000	\$ 900
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	150	0	0	0	0

IV. B. Plant Funded Construction Project

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

TEC: \$ 3,130  
TPC: \$ 3,130

Start Date: 3rd Qtr. FY 1993 Completion Date: 4th Qtr. FY 1995

2. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Proposed Reallocation of General Reduction</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 1,130	-330 <u>a/</u>	+ 104 <u>b/</u>	\$ 904	\$ 600
1994	1,926	0	0	1,926	1,530
1995	300	0	0	300	1,000

a/ Application of a portion of the FY 1993 programmatic general reduction of \$40,000,000.

b/ Proposed reallocation of FY 1993 general reduction to make project funding consistent with requested resources in FY 1994.

3. Narrative: This project supports roof replacement on 13 buildings at BNL. Approximately 385,000 sq. ft. of re-roofing will be accomplished during this phase.

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.

4. Total Project Funding (BA):	<u>Prior Years</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994 Request</u>	<u>To Complete</u>
Construction.....	\$ 0	\$ 0	\$ 904	\$ 1,926	\$ 300
Capital Equipment.....	0	0	0	0	0
Operating Expenses.....	0	0	0	0	0

DEPARTMENT OF ENERGY  
FY 1994 CONGRESSIONAL BUDGET REQUEST

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
(Tabular dollars in thousands. Narrative material in whole dollars.)

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

- |   |  |
|---|--|
| 1. Title and Location of Project: General Plant Projects<br>Various locations   | 2a. Project No. GPE-801<br>2b. Construction Funded   |
| 3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 1st Qtr. FY 1994 | 5. Previous Cost Estimate:<br>Total Estimated Cost (TEC) -- None<br>Total Project Cost (TPC) -- None |
| 3b. A-E Work (Title I & II) Duration: 6-12 Months                               |  |
| 4a. Date Physical Construction Starts: 2nd Qtr. FY 1994                         | 6. Current Cost Estimate:<br>TEC -- \$ 9,000<br>TPC -- \$ 9,000                                      |
| 4b. Date Construction Ends: 4th Qtr. FY 1994                                    |  |

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Obligations</u>	<u>FY 1992</u>	<u>Costs</u>		
			<u>FY 1993</u>	<u>FY 1994</u>	<u>After FY 1994</u>
FY 1994 Projects	\$ 9,000	\$ 0	\$ 0	\$ 7,000	\$ 2,000

1. Title and Location of Project:	General Plant Projects Various Locations	2a. Project No. GPE-801
		2b. Construction Funded

8. Brief Physical Description of Project

In order to support landlord responsibilities at Oak Ridge National Laboratory (ORNL) and Oak Ridge Institute for Science and Education (ORISE), \$9,000,000 is requested for general plant projects.

This estimate is for minor new construction and other capital alterations to land, buildings and utilities systems. The estimate also includes the cost of installed equipment which is an integral part of the general plant subprojects. Although it is difficult to identify particular projects in advance, all of the subprojects identified below are currently being considered for FY 1994 support. The estimated costs for each of the subprojects are preliminary in nature, with a project limitation of \$1,200,000. Since needs and priorities may change, other projects will be added and may be substituted for the examples listed below. These general plant projects will contribute to greater efficiency, eliminate health and safety hazards, and reduce maintenance and operational cost.

HVAC Upgrade, Geosciences Laboratory (ORNL)..... \$ 1,120

The Geosciences Laboratory is an essential part of the geosciences/environmental restoration activities at ORNL. Specific activities housed in the building include the Martin Marietta Energy Systems' (MMES) Office of Groundwater Management, the ORNL Groundwater Coordinator, the Oak Ridge Hydrology Support Program, and all geophysical projects. The heating/air conditioning system is antiquated and inadequate for proper environmental control. It constantly is being repaired and, with the influx of new staff and temperature/humidity sensitive computing and geophysical equipment, requires upgrading. Window AC units are currently being used, but these prove to be ineffective in this building.

Upgrade HVAC, Engineering, Technology Administration and Laboratory (ORNL) ..... \$ 700

This project will upgrade the existing HVAC system by installing a central chilled water system to replace several smaller units in various portions of the facility. Chilled water will be distributed throughout the facility to air handlers in occupied areas of the building.

Upgrade Coal Yard Runoff Treatment Plant (ORNL) ..... \$ 950

This project will provide increased treatment capacity and capability at the Coal Yard Runoff Treatment Plant. This upgrade will require the addition/enlarging of pumps, tanks, mixers, clarifiers and filters as well as upgrading the support utility services.

1. Title and Location of Project: General Plant Projects Various Locations	2a. Project No. GPE-801 2b. Construction Funded
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8. Brief Physical Description of Project (Continued)

Medical Records Fire Protection and Storage (ORNL) ..... \$ 800

This project will provide enclosures for protection and storage of medical records.

New Parking Lot Paving and Curbing (ORNL) ..... \$ 385

This project will provide paving, striping, and installation of curbs in new parking lots at 12 areas throughout the laboratory.

Reduce Steam for Building 4501 from 250 to 50 psig (ORNL) ..... \$ 1,100

This project will remove the 250-psig steam header from Buildings 4501/4505 along with several reducing stations in the facility, and replace the higher pressure steam with a 50-psig header originating in the steam pit number 25.

New Cooling Tower for the Radiochemical Engineering Development Center (REDC) (ORNL) ..... \$ 700

This project consists of installation of a new water cooling tower to serve as the final heat discharge loop, prior to discharge to process drain, for the main HVAC chiller system for the REDC. All of the standard accessories and adjunctive services and utilities included for a cooling tower will be required. These include electrical service, piping of water to the chiller, liquid discharge from the chiller, site preparation work and structural/architectural work required to erect/install the tower.

Chilled Water System Improvements, Compressor House (ORNL) ..... \$ 150

This project consists of the installation of a new sidestream filtration system and chemical make-up station in the central chilled water system in the compressor house.

Extend Walker Branch Power Line (ORNL) ..... \$ 1,100

This project consists of extending existing powerline (13.8KV) approximately 0.5 mile along the watershed perimeter road to the interior.

Add 13.8 KV Reclosers (ORNL) ..... \$ 150

This project will add six sectionalizing reclosers to the 13.8KV electrical distribution system.

1. Title and Location of Project: General Plant Projects Various Locations	2a. Project No. GPE-801 2b. Construction Funded
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8. Brief Physical Description of Project (Continued)

Secondary Containment Fuel Oil Tank Storage Tank (ORNL) ..... \$ 150

This project will install a concrete liner in the existing gravel secondary containment area around the 70,000 gallon fuel tank located south of the Steam Plant.

Maintenance Shop Addition - Compressor House (ORNL) ..... \$ 645

This project will construct an addition of approximately 1,200 square feet to the Compressor House shop for maintenance personnel to work on the major air conditioning units and support equipment.

Replace Switchgear (ORNL) ..... \$ 500

This project will provide for the replacement of the 2,400 volt switchgear, at the 3000 substation.

Loading Docks Pavement Modification (ORNL)..... \$ 300

This project will remove existing asphalt, excavate to grade and replace asphalt.

Office Addition - Administration Support Building (ORISE) ..... \$ 130

Approximately 2000 gsf of current storage space will be converted to use for open office space. Includes construction of partition walls, installation of HVAC system, and upgrade electrical and communications system. Work also includes modification of sprinkler and fire alarm systems as required.

Rebuild/Replace Roof of "D" Building (ORISE) ..... \$ 120

This project will replace deteriorated roof on "D" building of the Vance Road Complex. Includes replacing shingles of roof, repairing of decking/framing as needed, patching around flashing, removing unused roof penetrations, and patching and sealing roofs of attached buildings H and L as needed.



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1. Title and Location of Project: General Plant Projects  
Various Locations

2a. Project No. GPE-801  
2b. Construction Funded

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

HVAC Upgrade, Geosciences Laboratory (ORNL)

The current situation of lack of suitable heat/air conditioning will further degenerate and equipment will be sacrificed. A wet laboratory where contaminated materials are studied will not be usable and staff morale will further degrade. Projects and programs that have impact at all five MMES sites will be adversely affected.

Upgrade HVAC, Engineering, Technology Administration and Laboratory (ORNL)

The existing system is inefficient and complex with climate control essentially nonexistent. Replacement parts are no longer available, resulting in extended outages and escalating repair costs.

Upgrade Coal Yard Runoff Treatment Plant (ORNL)

During periods of rain, the existing treatment plant's capabilities are exceeded, periodically resulting in an effluent discharge which is in violation of the NPDES Permit. While treatment capacity is the primary bottleneck, additional treatment capabilities must also be included in order to adequately remove oil and grease and other suspended solids from the effluent stream.

Medical Records Fire Protection and Storage (ORNL)

This project will bring the storage of medical records which are now vulnerable to fire and water damage into compliance. This item was also on the Tiger Team Findings List.

New Parking Lot Paving and Curbing (ORNL)

Paving of these areas would allow the establishment of defined entrances, exits, and parking spacing, thus minimizing the vehicle accident hazard associated with the random flow patterns and parking which now exist. Maintenance associated with gravel lots would be eliminated and general appearance around these areas would be enhanced.

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1. Title and Location of Project: General Plant Projects Various Locations	2a. Project No. GPE-801 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project (Continued)

Reduce Steam for Building 4501 from 250 to 50 psig (ORNL)

Conversion of the steam system to a maximum of 50 psig would eliminate the unnecessary 250 psig header and station in the building removing a serious safety hazard or at least greatly reducing one. Provision of more uniform control of the coil steam temperatures of the central HVAC heating systems will provide specifically better modulation control for the total system. Installation of the cross-tie of the now 50 psig header in Buildings 4501/4505 to the existing header in Building 4500N will provide a valuable alternate feed steam supply for Buildings 4501/4505 in the event of the loss of filter pit 25 as the primary supplier of steam to Buildings 4501/4505. This system is also considerable more energy efficient.

New Cooling Tower for the Radiochemical Engineering Development Center (REDC) (ORNL)

This project is needed to maintain a safe working environment with the REDC buildings with regard to preventing heat stress and/or heat exhaustion of the personnel working in the laboratories, hot cell operating control rooms, and support areas. These areas have no alternative to conditioned air to maintain safe working conditions. The air conditioning chillers have to operate longer and are more susceptible to failure which would cause a serious loss of working capability.

Chilled Water System Improvements, Compressor House (ORNL)

Sludge buildup from bacteria, chemical reaction and other sources is a continuing problem in the Central Chilled Water System. This sludge settles out in heat exchangers and other areas throughout the system seriously affecting system efficiency and reliability. The installation of a sidestream filter will allow for the continuous removal of these solids before they can settle out and cause operational problems.

Extend Walker Branch Power Line (ORNL)

The proposed extension will open up major new areas of the watershed to intensive research effort. Expanded research activities on the watershed are currently limited by the availability of electrical service to support instrumentation and machinery necessary to accomplish expanded research objectives.

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1. Title and Location of Project: General Plant Projects  
Various Locations

2a. Project No. GPE-801  
2b. Construction Funded

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

Add 13.8 KV Reclosers (ORNL)

The addition of this equipment will result in a more reliable electrical system. It will lessen the impact of failures on the distribution system. This project is also the result of a 1979 study that recommended addition sectionalizing.

Secondary Containment Fuel Oil Tank Storage Tank (ORNL)

This project will correct a violation of 40-CFR PT 151, Hazardous Substance Spill Prevention. It is also needed for protection of the environment.

Maintenance Shop Addition - Compressor House (ORNL)

Maintenance and repair work is currently performed in the operating areas of the facility seriously affecting the safe operation of the facility and the safe, expedient repair of these critical equipment items. Operational safety, efficiency and reliability are often compromised because of the need for an area to work on this equipment. Aisleways between and around this equipment are often inaccessible because of ongoing maintenance and repair activities.

Replace Switchgear (ORNL)

The original was built in the 1940s. Spare parts are becoming obsolete. The age of the equipment is causing increased failures and maintenance problems. This replacement with modern breakers will provide a more reliable and safer to operate system.

Loading Docks Pavement Modification (ORNL)

The uneven alignment of pavement at Building 7001 dock area causes the dock height to fluctuate from 39 inches up to 50 inches. The 7040 gas cylinder dock is presently at the optimal height (48 inches) at the south end, but the asphalt slopes up 16 inches at the north end of the facility. The inconsistency of the dock heights creates the potential for injuries and decreases material handling efficiency. This has been recognized as a serious safety concern by ORNL's Safety Department.

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1. Title and Location of Project: General Plant Projects Various Locations	2a. Project No. GPE-801 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project (Continued)

Office Addition - Administration Support Building (ORISE)

The support staff at the Administration Support Building has increased due to relocation of the mailroom, reproduction services and other support staff into the building. This has created a severe shortage of office space and has resulted in overcrowding. This project will relieve the overcrowding.

Rebuild/Replace Roof of "D" Building (ORISE)

The roofs on buildings D, H, and L have exceeded their expected life and show significant deterioration. Portions of the roofs leak and require an increasing amount of maintenance.

10. Details of Cost Estimate

Based on preliminary conceptual design.

11. Method of Performance

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

DEPARTMENT OF ENERGY  
FY 1994 CONGRESSIONAL BUDGET REQUEST

(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT CAPITAL AND EQUIPMENT  
(Tabular dollars in thousands. Narrative material in whole dollars.)

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

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1. Title and Location of Project:	Roofing Improvements	2a. Project No. 94-E-363
	Oak Ridge National Laboratory	2b. Construction Funded
	Oak Ridge, Tennessee	

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SIGNIFICANT CHANGES

- o Project proposed as new start in FY 1993 (93-E-329) delayed until FY 1994 (94-E-363) due to decrease in FY 1993 funding.
- o A-E initiation date changed from 1st quarter FY 1993 to 1st quarter FY 1994 due to delayed start.
- o Date physical construction starts changed from 2nd quarter FY 1993 to 2nd quarter FY 1994 due to delayed start.
- o Completion date changed from 4th quarter FY 1996 to 4th quarter FY 1997 due to delayed start.
- o Increase in TEC from \$15,000,000 to 16,000,000 due to delayed start.
- o Increase in TPC from \$15,000,000 to 16,120,000 due to delayed start.

DEPARTMENT OF ENERGY  
 FY 1994 CONGRESSIONAL BUDGET REQUEST  
 (Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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

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1. Title and Location of Project: Roofing Improvements  
 Oak Ridge National Laboratory  
 Oak Ridge, Tennessee

2a. Project No. 94-E-363  
 2b. Construction Funded

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3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 1st Qtr. FY 1994

3b. A-E Work (Title I & II) Duration: 12 Months

5. Previous cost estimate: None  
 Total Estimated Cost (TEC) -- \$15,000  
 Total Project Cost (TPC) -- \$15,070

---

4a. Date Physical Construction Starts: 2nd Qtr. FY 1994

4b. Date Construction Ends: 4th Qtr. FY 1997

6. Current Cost Estimate:  
 TEC -- \$16,000  
 TPC -- \$16,120

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7. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 4,024	-4,024 a/	\$ 0	\$ 0
1994	3,300	0	3,300	1,500
1995	3,700	0	3,700	4,500
1996	5,000	0	5,000	4,500
1997	4,000	0	4,000	5,000
1998	0	0	0	500

a/ This project was proposed as an FY 1993 new start (93-E-329). Application of a portion (-\$4,024,000) of the FY 1993 programmatic general reduction of \$40,000,000 necessitated a delay in the start of this project to FY 1994.

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1. Title and Location of Project: Roofing Improvements  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee

2a. Project No. 94-E-363  
2b. Construction Funded

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8. Brief Physical Description of Project

Due to budgeting constraints, the start of this project was delayed from FY 1993 (Project No. 93-E-329) to FY 1994 resulting in an attendant increase in TEC and TPC. The TEC has been increased from \$15,000,000 to \$16,000,000. The TPC has been increased from \$15,070,000 to \$16,120,000.

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 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.

9. Purpose, Justification of Need For, 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 70 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 environment, safety and health 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.

<b>1. Title and Location of Project:</b> Roofing Improvements Oak Ridge National Laboratory Oak Ridge, Tennessee	<b>2a. Project No.</b> 94-E-363 <b>2b. Construction Funded</b>
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**9. Purpose, Justification of Need For, and Scope of Project (Continued)**

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.

**10. Details of Cost Estimate a/**

**Total Cost**

a. 1. Engineering design and inspection at approximately 5.1 percent of construction costs, items b and c.....	\$ 750
2. Project management costs approximately 9.5 percent of construction costs, items b and c.....	1,300
b. Construction costs (install new roofing)b/.....	2,940
c. Removal and packaging of existing roofing.....	<u>8,480</u>
Subtotal.....	13,470
d. Contingencies at approximately 20 percent of above costs.....	<u>2,530</u>
Total line item cost .....	<u>\$16,000</u>

**a/** The cost estimate is based on conceptual design completed April 1991 at a cost of \$70,000 and updated November 1992. 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.



1. Title and Location of Project: Roofing Improvements  
 Oak Ridge National Laboratory  
 Oak Ridge, Tennessee

2a. Project No. 94-E-363  
 2b. Construction Funded

12. Schedule of Project Funding and Other Related Funding Requirements

	<u>Prior Years</u>	<u>FY 1994</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Total</u>
a. Total project funding							
1. Total facility costs							
(a) Line item .....	\$ 0	\$ 1,500	\$ 4,500	\$ 4,500	\$ 5,000	\$ 500	\$16,000
Total direct costs.....	\$ 0	\$ 1,500	\$ 4,500	\$ 4,500	\$ 5,000	\$ 500	\$16,000
2. Other project costs							
(a) Conceptual design costs.....	\$ 70	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 70
(b) Other project related costs.....	50	0	0	0	0	0	50
Total other project related costs .	120	1,500	4,500	4,500	5,000	500	16,120
Total project costs (TPC) .....	\$120	\$1,500	\$ 4,500	\$ 4,500	\$ 5,000	\$ 500	\$16,120
b. Related annual funding (Estimated life of project: 20 Years).....							\$ 500

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

- a. Total project funding
1. Total facility costs
    - (a) 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 \$16,000,000. This includes \$60,000 for readiness reviews.
  2. Other project costs
    - (a) Conceptual design costs - The conceptual design was completed March 1991 at a cost of \$50,000.
    - (b) Other project related funding - The design criteria will be completed July 1992 at a cost of \$50,000.
- b. Other related funding requirements
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.

DEPARTMENT OF ENERGY  
FY 1994 CONGRESSIONAL BUDGET REQUEST

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
(Tabular dollars in thousands. Narrative material in whole dollars.)

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

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1. Title and Location of Project: Fuel Storage and Transfer  
Facility Upgrade  
Brookhaven National Laboratory  
Upton, New York

2a. Project No. 94-E-351  
2b. Construction Funded

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3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 2nd Qtr. FY 1994

3b. A-E Work (Title I & II) Duration: 10 Months

5. Previous Cost Estimate:  
Total Estimated Cost (TEC) -- None  
Total Project Cost (TPC) -- None

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4a. Date Physical Construction Starts: 4th Qtr. FY 1994

4b. Date Construction Ends: 1st Qtr. FY 1996

6. Current Cost Estimate:  
TEC -- \$ 3,850  
TPC -- \$ 3,900

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
1994	\$1,000	\$1,000	\$ 800
1995	2,850	2,850	2,616
1996	0	0	434

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1. Title and Location of Project: Fuel Storage and Transfer  
Facility Upgrade  
Brookhaven National Laboratory  
Upton, New York

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2a. Project No. 94-E-351  
2b. Construction Funded

8. Brief Physical Description of Project

This project will upgrade the existing fuel storage and transfer facility (FSTF) at BNL to bring it into compliance with local and state codes for handling and storage of fuel oil, and will be in compliance with the NEPA and related DOE Orders.

A fuel truck unloading and transfer facility capable of unloading four trucks will be constructed. This facility will consist of a two sided pre-engineered enclosure with unloading booms and fire detection and protection systems, all constructed on a diked containment area equipped with leak detection systems and oil/water separator.

The fuel transfer facility enclosure will be constructed of uninsulated metal siding on a structural steel frame totalling approximately 5,600 square feet.

A pump house will be constructed adjacent to the fuel transfer enclosure. The pump house will draw fuel from the trucks via unloading booms and will discharge to the various fuel storage tanks. The pump house will consist of a building of approximately 1,200 square feet. The pump house will have pumps connected to the unloading booms via piping in a pipe tunnel located below grade. The pipe tunnel will provide secondary containment and will be fitted with a leak detection system and an oil/water separator connected to holding tanks. The pump house will have pumps for transferring oil among tanks and for circulating oil for tank heating.

Modifications to fuel piping will require installation of approximately 6,000 feet of above ground and underground distribution piping fitted with heat-tracing, leak detection and secondary containment systems. Modifications to fuel storage tanks will require coating the inner bottom of six tanks with an epoxy coating system.

Application of the epoxy requires stripping, degassing and sandblasting of the tanks. Additional modifications required for storage tanks are (1) installation of double bottoms and leak detection systems in two tanks, (2) installation of cathodic protection systems on eight tanks, and (3) installation of fixed foam fire protection systems on eight tanks.

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1. Title and Location of Project: Fuel Storage and Transfer Facility Upgrade Brookhaven National Laboratory Upton, New York	2a. Project No. 94-E-351 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project

This project will bring the BNL FSTF into compliance with state and local codes for handling and storage of fuel oil. The FSTF provides the only supply of fuel for the BNL Central Steam Facility (CSF) and the CSF is the primary source of heating and process steam for the entire laboratory. Renewal of the major petroleum facility license for the FSTF is contingent on timely upgrade of the facility to meet current code requirements. Failure to receive a renewed license could jeopardize operation of the CSF and impact programmatic operations.

The location of BNL over an EPA designated sole-source aquifer has heightened regulatory concern over potential groundwater contamination from BNL facilities. In 1987, DOE and BNL agreed to comply with Suffolk County Department of Health Services' (SCDHS) regulations targeted at groundwater protection. The regulations applicable to the FSTF are defined by SCDHS Sanitary Code Article 12 and by the New York State Department of Environmental Conservation (NYSDEC) rules for bulk petroleum storage facilities.

The BNL FSTF has a current storage capacity of over 2,000,000 gallons of residual and light petroleum fuels. This facility has been modified and expanded several times from its original construction in 1948 until 1986. However, these modifications preceded recent changes in state and local code requirements for the storage and handling of petroleum fuels.

Current regulations require that fuel off-loading areas be provided with shelter from rain and have improved containment. The capacity of the containment must exceed the largest fuel truck capacity by 10 percent. The regulations also require that all underground piping must have secondary containment and leak detection systems as must all new above ground piping. All storage tanks must have overfill protection systems and impervious secondary containment. Those tanks in direct contact with the ground must have cathodic protection systems and, depending on their date of installation, must have their bottoms coated with epoxy or fitted with a double bottom and leak detection system.

BNL has been able to meet the requirements of some of the new code modifications through the General Plant Projects (GPP) program. All the tanks have or are in the process of having overfill protection systems installed and have had the necessary modifications for secondary containment. However, the scope and cost of meeting full compliance for the FSTF requires a line item project.

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1. Title and Location of Project: Fuel Storage and Transfer  
Facility Upgrade  
Brookhaven National Laboratory  
Upton, New York

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2a. Project No. 94-E-351  
2b. Construction Funded

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

The regulatory timetable for achieving compliance for the FSTF has been exceeded and will require a temporary waiver to continue operations. Renewal of the NYSDEC Major Petroleum Facility license will be dependent upon having a conceptual plan and a funding commitment in place to perform the upgrades needed to achieve full compliance.

An additional benefit of implementing this project is that it will enable reactivation of the Alternate Liquid Fuel Program (ALF). The ALF program, as required by SEN 28, reduces the consumption and dependence on imported petroleum. The ALF program had to be curtailed because the FSTF did not meet the compliance requirements for the light fuels handled and stored as part of the ALF program.

In order to bring the FSTF into compliance with all applicable codes, the following actions will be undertaken during this project:

- a. A fuel truck unloading enclosure will be constructed to minimize run-off in the fuel handling area. The area will have diked secondary containment with leak detection systems and an oil/water separator to process any run-off collected.
- b. A pump house will be constructed to enable unloading and transfer of fuel from trucks more safely.
- c. All underground piping will be replaced with new piping fitted with secondary containment and leak detection systems.
- d. New above ground piping fitted with secondary containment and leak detection will be installed where necessary to improve the safety of transfer operations.
- e. All fuel storage tanks in contact with the ground will be epoxy coated on the inner bottom. Those tanks containing light fuels will have double bottoms and leak detection systems installed.
- f. All fuel storage tanks in contact with the ground will be fitted with cathodic protection systems.
- g. Fuel tanks which store fuel oils with flashpoints below 100° F will be fitted with fixed foam fire protection systems.

<b>1. Title and Location of Project:</b> Fuel Storage and Transfer Facility Upgrade Brookhaven National Laboratory Upton, New York	<b>2a. Project No. 94-E-351</b> <b>2b. Construction Funded</b>
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**10. Details of Cost Estimate a/**

	<u>Item Cost</u>	<u>Total Cost</u>
a. 1. Engineering design and inspection and quality assurance at approximately 12.8 percent of construction costs, Item b.....		\$ 382
2. Project management at approximately 2 percent of costs, Item a.1. and Item b.....		64
b. Construction costs.....		2,914
1. Fuel Transfer Facility.....	\$1,203	
2. Piping Upgrades.....	935	
3. Fuel Tank Upgrades.....	575	
4. Fire Protection Upgrades.....	201	
Subtotal.....		\$ 3,360
c. Contingencies at approximately 14.6 percent of the above cost.....		490
Total line item cost .....		\$ 3,850 b/

a/ The above estimates are based on the Conceptual Design Report dated December 1991.

b/ Escalation rates used were taken from DOE Department Price Change Index - FY 1993 Guidance, August 1991 update.

**11. Method of Performance**

Engineering, design and inspection shall be performed by the operating contractor in conjunction with a fixed price evaluated architect/engineer contract. Construction and procurement shall be accomplished by fixed price contracts awarded on the basis on competitive bidding.

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

Not required on projects with a TEC of less than \$5,000,000 per draft DOE Order 5100.3a.

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

Conceptual design completed at \$50,000. Other data not required on projects with a TEC of less than \$5,000,000 per draft DOE Order 5100.3a.

DEPARTMENT OF ENERGY  
FY 1994 CONGRESSIONAL BUDGET REQUEST

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
(Tabular dollars in thousands. Narrative material in whole dollars.)

MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES

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1. Title and Location of Project:	Potable Water System Upgrade - Phase I Brookhaven National Laboratory Upton, New York	2a. Project No. 93-E-325
		2b. Construction Funded

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SIGNIFICANT CHANGES

- o Completion date changed from 4th quarter FY 1994 to 4th quarter FY 1995 because of reduction in FY 1993 funding.
- o TEC increased from \$5,250,000 to \$5,380,000 due to reduction in FY 1993 funding.

DEPARTMENT OF ENERGY  
FY 1994 CONGRESSIONAL BUDGET REQUEST

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
(Tabular dollars in thousands. Narrative material in whole dollars.)

MULTIPROGRAM ENERGY LABORATORIES - FACILITIES SUPPORT  
MULTIPROGRAM ENERGY LABORATORIES - GENERAL PURPOSE FACILITIES

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

2a. Project No. 93-E-325  
2b. Construction Funded

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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: 8 months

4a. Date Physical Construction Starts: 4th Qtr. FY 1993

4b. Date Construction Ends: 4th Qtr. FY 1995

5. Previous Cost Estimate:  
Total Estimated Cost (TEC) -- \$5,250  
Total Project Cost (TPC) -- \$5,250

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6. Current Cost Estimate:  
TEC -- \$ 5,380  
TPC -- \$ 5,380

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 3,500	\$-2,000 a/	\$1,500	\$ 600
1994	2,017	0	2,017	2,700
1995	1,863	0	1,863	2,080

a/ Application of a portion (-\$2,800,000) of the FY 1993 programmatic general reduction of \$40,000,000 and proposed reallocation (+\$800,000) of FY 1993 funding consistent with requested resources in FY 1994.



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1. Title and Location of Project: Potable Water System Upgrade - Phase I	2a. Project No. 93-E-325
Brookhaven National Laboratory	2b. Construction Funded
Upton, New York	

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8. Brief Physical Description of Project

Due to budgetary constraints, this project has been stretched out from the 4th quarter of FY 1994 to 4th quarter FY 1995 resulting in an increase in TEC and TPC. The TEC and TPC have been increased from \$5,250,000 to \$5,380,000.

This project commences upgrade of the 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.
- 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 For, 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.

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1. Title and Location of Project:	Potable Water System Upgrade - Phase I Brookhaven National Laboratory Upton, New York	2a. Project No. 93-E-325 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project (Continued)

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.

- 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.

1. Title and Location of Project: Potable Water System Upgrade - Phase I Brookhaven National Laboratory Upton, New York	2a. Project No. 93-E-325 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project (Continued)

c. Transite Piping (Continued)

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.

	<u>Item Cost</u>	<u>Total Cost</u>
a. 1. Engineering design and inspection and administration at approximately 14 percent of construction costs, item b and c.....		\$ 578
2. Project management at 2 percent of construction costs, item b.....		63
b. Construction costs.....		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).....		<u>980</u>
Subtotal.....		\$ 4,771
d. Contingencies at approximately 12.8 percent of above costs .....		609
Total line item cost.....		<u>\$ 5,380</u>

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.

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. 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 1994 CONGRESSIONAL BUDGET REQUEST  
 (Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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

- |  |  |  |                          |
|--|--|--|--------------------------|
| 1. Title and Location of Project:                              | Electrical System Upgrade - Phase II<br>Argonne National Laboratory<br>Argonne, Illinois |  | 2a. Project No. 93-E-313 |
|  |  |  | 2b. Construction Funded  |
|  |  |  |                          |
| 3a. Date A/E Work Initiated, (Title I Design Start Scheduled): | 2nd Qtr. FY 1993   |  |                          |
| 3b. A/E Work (Title I & II) Duration:                          | 8 Months   |  |                          |
|  |  |  |                          |
| 4a. Date Physical Construction Starts:                         | 2nd Qtr. FY 1994   |  |                          |
| 4b. Date Construction Ends:                                    | 4th Qtr. FY 1995   |  |                          |
| 7. <u>Financial Schedule:</u>                                  |  |  |                          |

5. Previous Cost Estimate:  
 Total Estimated Costs (TEC) -- None  
 Total Project Cost (TPC) -- None
6. Current Cost Estimate:  
 TEC -- \$5,100  
 TPC -- \$5,259

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 3,000	-2,000 a/	\$1,000	\$ 500
1994	2,150	0	2,150	2,000
1995	1,950	0	1,950	2,100
1995	0	0	0	500

a/ Application of a portion (-\$2,400,000) of the FY 1993 programmatic general reduction of \$40,000,000 and proposed reallocation (+\$400,000) of FY 1993 funding consistent with requested resources in FY 1994.

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1. Title and Location of Project:	Electrical System Upgrade - Phase II Argonne National Laboratory Argonne, Illinois	2a. Project No. 93-E-313 2b. Construction Funded
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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 For, 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.

1. Title and Location of Project:	Electrical System Upgrade - Phase II Argonne National Laboratory Argonne, Illinois	2a. Project No. 93-E-313 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project (Continued)

e. If this project is not approved, costly, inefficient, adverse and unsafe conditions will continue. The frequency and duration of partial, or total, functional shutdowns of scientific work, some of which are time sensitive, would increase. Yearly maintenance costs would also increase and be subject to inflationary pressures as well. Finally, morale would be impaired as the laboratory would be ignoring serious safety concerns. A do nothing approach is not recommended.

10. <u>Details of Cost Estimate a/</u>	<u>Item Cost</u>	<u>Total Cost</u>
a. 1. Engineering design and inspection at approximately 14 percent of construction costs .....		\$ 520
2. Construction management at approximately 3 percent of construction costs.....		110
3. Project management at approximately 2 percent of construction costs.....		70
b. Construction Costs.....		3,740
1. Loop switches and manholes.....	\$ 750	
2. 13.2 kV bldg. cable laterals.....	375	
3. 13.2 kV loop feeder cables.....	1,750	
4. 13.2 kV auto. transfer switches.....	265	
5. Supervisory system.....	600	
Subtotal.....		<u>4,440</u>
c. Contingencies at approximately 15 percent of above costs.....		<u>660</u>
Total line item cost .....		<u>\$5,100 b/</u>

a/ The above estimates are based on a completed conceptual design and current cost data.  
b/ All costs have been escalated from January 1991 to the midpoint of construction at the rate of 19.7%. Escalation rate methodology 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%.

1.	Title and location of project:	Electrical System Upgrade - Phase II Argonne National Laboratory Argonne, Illinois	2a. Project No. 93-E-313 2b. Construction Funded
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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. 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 funding								
1. Total facility costs								
(a) Line item .....	\$ 0	\$ 0	\$ 0	\$ 500	\$2,000	\$2,100	\$ 500	\$5,100
Total direct costs .....	\$ 0	\$ 0	\$ 0	\$ 500	\$2,000	\$2,100	\$ 500	\$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 (TPC) .....	\$ 131	\$ 28	\$ 0	\$ 500	\$2,000	\$2,100	\$ 500	\$5,259
b. Total related annual costs (estimated life of project: 30 years)								
None.								

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

- a. Total project costs (TPC)
  - 1. Total project costs
    - (a) Line item -- Narrative not required.
  - 2. 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).

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

b. Related annual funding

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.



DEPARTMENT OF ENERGY  
 FY 1994 CONGRESSIONAL BUDGET REQUEST

(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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

- |   |  |
|---|--|
| 1. Title and Location of Project: Electrical Substation Upgrade<br>Argonne National Laboratory (ANL)<br>Argonne, Illinois | 2a. Project No. 92-E-329<br>2b. Construction Funded  |
| -----   |  |
| 3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 2nd Qtr. FY 1992   | 5. Previous Cost Estimate:<br>Total Estimated Cost (TPC) -- None<br>Total Project Cost (TPC) -- None |
| 3b. A-E Work (Title I & II) Duration: 14 Months   |  |
| -----   |  |
| 4a. Date Physical Construction Starts: 3rd Qtr. FY 1993   | 6. Current Cost Estimate:<br>TEC -- \$4,970<br>TPC -- \$4,970  |
| 4b. Date Construction Ends: 4th Qtr. FY 1994  |  |
| 7. <u>Financial Schedule:</u>   |  |

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$ 500	0	\$ 500	\$ 91
1993	4,470	-2,070 <sup>a/</sup>	2,400	2,000
1994	2,070	0	2,070	2,570
1995	0	0	0	309

<sup>a/</sup> Application of a portion (-\$2,070,000) of the FY 1993 programmatic general reduction of \$40,000,000, a portion (-\$290,000) of the FY 1993 Energy Supply R&D general reduction of \$104,300,000 for use of prior year balances and proposed reallocation (+\$290,000) of FY 1993 funding consistent with requested resources in FY 1994.

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

2a. Project No. 92-E-329  
2b. Construction Funded

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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 For, 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.

1. Title and Location of Project: Electrical Substation Upgrade  
 Argonne National Laboratory  
 Argonne, Illinois

2a. Project No. 92-E-329  
 2b. Construction Funded

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 percent of construction costs.....		\$ 440
2. Project management at 3 percent of construction costs.....		110
3. Project management at 2 percent 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.....		<u>\$ 4,320</u>
c. Contingencies at approximately 15 percent of above costs.....		650
Total line item costs .....		<u>\$ 4,970 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%.

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1.	Title and Location of Project: Electrical Substation Upgrade Argonne National Laboratory (ANL) Argonne, Illinois	2a. Project No. 92-E-329 2b. Construction Funded
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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. 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 1994 CONGRESSIONAL BUDGET REQUEST

(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
(Tabular dollars in thousands. Narrative material in whole dollars.)

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

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1. Title and Location of Project:	Safety Compliance Modifications, 326 Building Pacific Northwest Laboratory Richland, Washington	2a. Project No. 92-E-324
		2b. Construction Funded

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SIGNIFICANT CHANGES

- o Date physical construction starts changed from 2nd quarter FY 1993 to 3rd quarter FY 1993 because of decrease in FY 1993 funding due to general reduction.
- o Completion date of 1st quarter FY 1994 changed to 4th quarter FY 1995 because of decrease in FY 1993 funding due to general reduction.

DEPARTMENT OF ENERGY  
 FY 1994 CONGRESSIONAL BUDGET REQUEST

(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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

- 
1. Title and Location of Project: Safety Compliance Modifications,  
 326 Building  
 Pacific Northwest Laboratory  
 Richland, Washington
- 2a. Project No. 92-E-324  
 2b. Construction Funded
- 
- 3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 2nd Qtr. FY 1992
5. Previous Cost Estimate:  
 Total Estimated Cost (TEC) -- \$8,400  
 Total Project Cost (TPC) -- \$8,520
- 3b. A-E Work (Title I & II) Duration: 13 Months
- 
- 4a. Date Physical Construction Starts: 3rd Qtr. FY 1993
6. Current Cost Estimate:  
 TEC -- \$ 8,400  
 TPC -- \$ 8,760
- 4b. Date Construction Ends: 4th Qtr. FY 1995

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$ 1,700	0	\$ 1,700	\$ 489
1993	6,000	-3,000 a/	3,000	2,500
1994	2,000	0	2,000	2,000
1995	1,700	0	1,700	1,911
1996	0	0	0	1,500

a/ Application of a portion of the FY 1993 programmatic general reduction of \$40,000,000.

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1. Title and Location of Project: Safety Compliance Modifications, 326 Building Pacific Northwest Laboratory (PNL) Richland, Washington	2a. Project No. 92-E-324 2b. Construction Funded
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8. Brief Physical Description of Project

Due to budgetary constraints, this project has been stretched out from the 1st quarter of FY 1994 to the 4th quarter of FY 1995. The TPC has been increased from \$8,520,000 to \$8,760,000 to cover other projected related costs estimated at \$240,000.

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 For, 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.

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 panels will be installed to alleviate the condition.

1. Title and Location of Project: Safety Compliance Modifications, 326 Building Pacific Northwest Laboratory (PNL) Richland, Washington	2a. Project No. 92-E-324 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project (Continued)

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, fire protection, and communication systems. 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 code and standards of acceptability for health and safety.

10. Details of Cost Estimates a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. 1. Engineering design and inspection at approximately 30 percent of construction costs, item b.....		\$ 1,535
b. Construction costs.....		4,968
1. Building (building modification only).....	4,808	
2. Utilities.....	60	
3. Special facilities.....	100	
Subtotal b/.....		<u>\$ 6,503</u>
c. Contingencies at approximately 29 percent of the above cost.....		<u>1,897</u>
Total line item costs ..... 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.



1. Title and Location of Project: Safety Compliance Modifications, 326 Building Pacific Northwest Laboratory (PNL) Richland, Washington	2a. Project No. 92-E-324 2b. Construction Funded
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**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.

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

	Prior Years	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	Total
a. Total project funding							
1. Total facility costs							
(a) Line item .....	\$ 0	\$ 489	\$2,500	\$2,000	\$1,911	\$1,500	\$8,400
Total.....	\$ 0	\$ 489	\$2,500	\$2,000	\$1,911	\$1,500	\$8,400
2. Other project costs							
(a) Conceptual design costs....	\$ 120	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 120
(b) Other project related costs	20	50	60	60	50	0	240
Total other project costs..	\$ 140	\$ 50	\$ 60	\$ 60	\$ 50	\$ 0	\$ 360
Total project costs (TPC) .	<u>\$ 140</u>	<u>\$ 539</u>	<u>\$2,560</u>	<u>\$2,060</u>	<u>\$1,961</u>	<u>\$1,500</u>	<u>\$8,760</u>

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

- a. Total project funding
  - 1. Total facility costs
    - (a) Line item -- \$8,400,000
    - (b) PE&D -- None
    - (c) Inventories necessary to put the facility into use are estimated to cost -- \$0
  - 2. Other project costs
    - (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 -- \$240,000

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1. Title and Location of Project: Safety Compliance Modifications, 326 Building Pacific Northwest Laboratory (PNL) Richland, Washington	2a. Project No. 92-E-324 2b. Construction Funded
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**13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements (Continued)**

**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 1994 CONGRESSIONAL BUDGET REQUEST  
 (Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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

<b>1. Title and Location of Project:</b> Upgrade Steam Distribution System - West End Oak Ridge National Laboratory Oak Ridge, Tennessee	<b>2a. Project No.</b> 92-E-323 <b>2b. Construction Funded</b>
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<b>3a. Date A-E Work Initiated, (Title I Design Start Scheduled):</b> 1st Qtr. FY 1992  <b>3b. A-E Work (Title I &amp; II) Duration:</b> 12 Months	<b>5. Previous Cost Estimate:</b> Total Estimated Cost (TEC) --\$9,000 Total Project Cost (TPC) -- \$9,130
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<b>4a. Date Physical Construction Starts:</b> 1st Qtr. FY 1993  <b>4b. Date Construction Ends:</b> 4th Qtr. FY 1995	<b>6. Current Cost Estimate:</b> TEC -- \$9,000 TPC -- \$9,130
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**7. Financial Schedule:**

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$1,080	0	\$1,080	\$ 604
1993	5,607	- 380 a/	5,227	3,300
1994	2,693	0	2,693	3,700
1995	0	0	0	1,396

a/ Application of a portion (-\$1,680,000) of the FY 1993 programmatic general reduction of \$40,000,000, a portion (-\$400,000) of the FY 1993 Energy Supply R&D general reduction of \$104,300,000 for use of prior year balances and proposed reallocation (+\$1,700,000) of FY 1993 funding consistent with requested resources in FY 1994.

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- |   |   |
|---|---|
| 1. Title and Location of Project: Upgrade Steam Distribution System - West End<br>Oak Ridge National Laboratory<br>Oak Ridge, Tennessee | 2a. Project No. 92-E-323<br>2b. Construction Funded |
|---|---|
- 

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.~~

9. Purpose, Justification of Need For, 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.

1. Title and Location of Project: Upgrade Steam Distribution System - West End Oak Ridge National Laboratory Oak Ridge, Tennessee	2a. Project No. 92-E-323 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project (Continued)

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 percent higher capital costs of installation including the necessary conversion of building heating systems from steam to hot water.

The second alternative, a 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.

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.

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 uneconomical.

10. Details of Cost Estimate: a/

	<u>Total Cost</u>
a. 1. Engineering design and inspection at approximately 16 percent of construction costs, item b..	\$ 1,010
2. Project Management at approximately 10 percent of construction costs, item b .....	640
b. 1. Construction costs b/.....	6,140
Subtotal.....	7,790
c. Contingencies at approximately 16 percent of above costs.....	1,210
Total line item cost .....	<u>\$ 9,000</u>

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.

1. Title and Location of Project: Upgrade Steam Distribution System - West End Oak Ridge National Laboratory Oak Ridge, Tennessee	2a. Project No. 92-E-323 2b. Construction Funded
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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. 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 funding						
1. Total facility costs						
(a) Line item .....	<u>\$ 0</u>	<u>\$ 604</u>	<u>\$ 3,300</u>	<u>\$ 3,700</u>	<u>\$ 1,396</u>	<u>\$ 9,000</u>
Total facility costs....	\$ 0	\$ 604	\$ 3,300	\$ 3,700	\$ 1,396	\$ 9,000
2. Other project costs						
(a) Conceptual design costs.	\$100	\$ 0	\$ 0	\$ 0	\$ 0	\$ 100
(b) Other project-related costs.....	<u>30</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>30</u>
Total other project funding.....	\$130	\$ 0	\$ 0	\$ 0	\$ 0	\$ 130
Total project cost (TPC).	<u>\$130</u>	<u>\$ 604</u>	<u>\$ 3,300</u>	<u>\$ 3,700</u>	<u>\$ 1,396</u>	<u>\$ 9,130</u>
b. Related annual funding (estimated life of project -- 50 years) .....						\$480,000

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

- a. Total project funding
- 1. Total facility costs
  - (a) Line item -- Narrative not required.
  - (b) PE&D -- Narrative not required.
  - (c) Expense-funded equipment -- Narrative not required.
  - (d) Inventories -- Narrative not required.

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1. Title and Location of Project:	Upgrade Steam Distribution System - West End	2a. Project No. 92-E-323
	Oak Ridge National Laboratory	2b. Construction Funded
	Oak Ridge, Tennessee	

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

2. Other project costs

(a) R&D necessary to complete construction -- Narrative not required.

(b) Conceptual design -- The conceptual design report was completed in January 1987, at a cost of approximately \$100,000.

b. Related annual funding

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 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 1994 CONGRESSIONAL BUDGET REQUEST  
 (Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

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

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1. Title and Location of Project: East Canyon Electrical Safety Project      2a. Project No. 92-E-322  
 Lawrence Berkeley Laboratory (LBL)      2b. Construction Funded  
 Berkeley, California

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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

5. Previous Cost Estimate:  
 Total Estimated Cost (TEC) -- \$3,900  
 Total Project Cost (TPC) -- \$3,900

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4a. Date Physical Construction Starts: 2nd Qtr. FY 1994

4b. Date Construction Ends: 4th Qtr FY 1995

6. Current Cost Estimate:  
 TEC -- \$3,900  
 TPC -- \$3,940

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$ 377	+48 a/	\$ 425	\$ 19
1993	1,507	-600 b/	907	581
1994	1,568	0	1,568	1,000
1995	1,000	0	1,000	1,400
1996	0	0	0	900

a/ Includes internal reprogramming from closed-out projects (87-R-753 - \$9,000; 88-R-807 - \$5,000; 90-R-107 - \$17,725; 90-R-108 - \$8,000; 90-R-113 - \$8,000).

b/ Application of a portion of the FY 1993 programmatic general reduction of \$40,000,000.



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1. Title and Location of Project:	East Canyon Electrical Safety Project Lawrence Berkeley Laboratory (LBL) Berkeley, California	2a. Project No. 92-E-322
		2b. Construction Funded

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

9. Purpose, Justification of Need For, 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.

1. Title and Location of Project: East Canyon Electrical Safety Project Lawrence Berkeley Laboratory (LBL) Berkeley, California	2a. Project No. 92-E-322 2b. Construction Funded
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9. Purpose, Justification of Need For, 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/

	<u>Item Costs</u>	<u>Total Cost</u>
a. 1. Engineering design and inspection at approximately 15 percent of construction costs, item b.....		\$ 425
2. Project management at approximately 7 percent of construction costs, item b .....		185
b. Construction costs.....		2,740
1. Utilities.....	\$ 1,817	
2. Special facilities engineered equipment.....	923	
Subtotal.....		<u>3,350</u>
c. Contingencies at approximately 16 percent above costs.....		550
Total line item cost.....		<u>\$3,900</u>

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.

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1. Title and Location of Project:	East Canyon Electrical Safety Project Lawrence Berkeley Laboratory (LBL) Berkeley, California	2a. Project No. 92-E-322
		2b. Construction Funded

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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. Schedule of Project Funding and Other Related Funding Requirements

Not required on projects with a TEC of less than \$5,000,000 per draft DOE Order 5100.3a.

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

Not required on projects with a TEC of less than \$5,000,000 per draft DOE Order 5100.3a.

DEPARTMENT OF ENERGY  
FY 1994 CONGRESSIONAL BUDGET REQUEST  
(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
(Tabular dollars in thousands. Narrative material in whole dollars.)

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

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1. Title and Location of Project: Environmental Health and Safety Project	2a. Project No. 88-R-806
Lawrence Berkeley Laboratory (LBL)	2b. Construction Funded
Berkeley, California	

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SIGNIFICANT CHANGES

- o A portion of this project was transferred to Office of Environmental Restoration and Waste Management (EM) in FY 1989 necessitating a change in funding profile.
  
- o TEC increase in FY 1992 from \$9,163,000 to \$13,163,000 due to need to perform ventilation system improvements while laboratory space is occupied and due to changes in uniform fire code with respect to storage of flammable materials in dispensing drums. TPC increased from \$9,163,000 to \$13,225,000.

DEPARTMENT OF ENERGY  
FY 1994 CONGRESSIONAL BUDGET REQUEST

(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
(Tabular dollars in thousands. Narrative material in whole dollars.)

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

- |   |  |
|---|--|
| 1. Title and Location of Project: Environmental Health and Safety Project<br>Lawrence Berkeley Laboratory (LBL)<br>Berkeley, California | 2a. Project No. 88-R-806<br>2b. Construction Funded  |
| 3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 2nd Qtr. FY 1988<br>b. A/E Work (Title I & II) Duration: 45 Months       | 5. Previous Cost Estimate:<br>Total Estimated Cost (TEC) -- \$9,163<br>Total Project Cost (TPC) -- \$9,250 |
| 4a. Date Physical Construction Starts: 2nd Qtr. FY 1988<br>4b. Date Construction Ends: 4th Qtr. FY 1995                                 | 6. Current Cost Estimate:<br>TEC -- \$13,163<br>TPC -- \$13,225  |

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 850	0	\$ 850	\$ 59
1989	3,448	-1,019 a/	2,429	1,090
1990	3,250	+1,060 a/	4,310	172
1991	2,777	-1,203 a/	1,574	891
1992	9	+ 500 b/	509	2,070
1993	1,500	+ 300 c/	1,800	4,000
1994	1,691	0	1,691	3,930
1995	0	0	0	951

- a/ Portion of this project was transferred to Office of Environmental Restoration and Waste Management (EM) necessitating a change in funding profile; also an internal reprogramming of funds from closed-out projects (83-E-308, 83-E-311, 81-E-309, 81-E-309, 81-E-318 and 81-E-325) was approved.
- b/ Internal reprogramming from 92-E-312 to continue project and comply with Tiger Team recommendations.
- c/ Application of a portion (-\$250,000) of the FY 1993 programmatic general reduction of \$40,000,000 and proposed reallocation (+\$550,000) of FY 1993 funding consistent with requested resources in FY 1994.

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1. Title and Location of Project: Environmental Health and Safety Project  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2a. Project No. 88-R-806  
2b. Construction Funded

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8. Brief Physical Description of Project

TEC increase in FY 1992 from \$9,163,000 to \$13,163,000 due to need to perform ventilation system improvements while laboratory space was occupied and due to uniform fire code changes with respect to storage of flammable materials in dispensing drums.

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 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.

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1. Title and Location of Project: Environmental Health and Safety Project  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2a. Project No. 88-R-806  
2b. Construction Funded

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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.

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1. Title and Location of Project: Environmental Health and Safety Project  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2a. Project No. 88-R-806  
2b. Construction Funded

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9. Purpose, Justification of Need For, 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.

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 potable water supply for personnel safety.



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1. Title and Location of Project: Environmental Health and Safety Project  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2a. Project No. 88-R-806  
2b. Construction Funded

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

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 conceptual designs in 1987 which now prohibit storage of dispensing drums in the horizontal position as was originally envisioned, and waste minimization planning at the laboratory has changed the requirement for the storage of drums. Central storage and dispensing is not required for preengineered 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.

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.

1. Title and Location of Project: Environmental Health and Safety Project  
Lawrence Berkeley Laboratory (LBL)  
Berkeley, California

2a. Project No. 88-R-806  
2b. Construction Funded

10. Details of Cost Estimate a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. 1. Engineering design and inspection at approximately 22 percent of construction costs, Item b.....		\$ 1,501
2. Project management at approximately 6 percent of construction costs, Item b .....		485
b. Construction costs.....		6,822
1. Improvements to land.....	\$ 29	
2. Buildings.....	5,051	
3. Other construction (other than buildings).....	493	
4. Special facilities.....	475	
5. Utilities.....	774	
c. Standard equipment.....		2,080
d. Removal costs less salvage.....		14
e. Relocations .....		142
Subtotal .....		<u>11,044</u>
f. Contingencies at approximately 14 percent of above costs .....		<u>2,119</u>
Total line item cost .....		<u>\$13,163</u>

a/ Construction costs were previously escalated from January 1, 1986 to midpoint of construction for each project. Escalation rates were 1.3% for FY 1986, 1.9% for FY 1987, 3.4% for FY 1988, 4.3% for FY 1989, 4.8% for FY 1990, 5.0% for FY 1991, 5.1% for FY 1992, 5.3% for FY 1993 and 5.5% for FY 1994.

11. Method of Performance

Engineering, design and inspection will be performed under 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 subproject 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.

<b>1. Title and Location of Project:</b> Environmental Health and Safety Project Lawrence Berkeley Laboratory (LBL) Berkeley, California	2a. Project No. 88-R-806 2b. Construction Funded
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**12. 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 funding							
1. Total facility costs							
(a) Line item.....	\$ 1,321	\$ 891	\$ 2,070	\$ 4,000	\$ 3,930	\$ 951	\$ 13,163
Total direct cost.....	\$ 1,321	\$ 891	\$ 2,070	\$ 4,000	\$ 3,930	\$ 951	\$ 13,163
2. Other project costs							
(b) Conceptual design costs...	41	0	21	0	0	0	62
Total project cost (TPC)..	<u>\$ 1,362</u>	<u>\$ 891</u>	<u>\$ 2,091</u>	<u>\$ 4,000</u>	<u>\$ 3,930</u>	<u>\$ 951</u>	<u>\$ 13,225</u>
b. Related annual funding (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.....				<u>\$ 15</u>			

**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 Environmental Health and Safety Project are self-sustaining requiring no additional equipment or facilities.

DEPARTMENT OF ENERGY  
FY 1994 CONGRESSIONAL BUDGET REQUEST

(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
(Tabular dollars in thousands. Narrative material in whole dollars.)

Multiprogram Energy Laboratories - Facilities Support  
Multiprogram Energy Laboratories - Tiger Team Remediations

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1.	Title and Location of Project:	Hazardous Materials Safeguards, Phase I Lawrence Berkeley Laboratory Berkeley, California	2a.	Project No.	93-E-324
			2b.	Construction Funded	

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SIGNIFICANT CHANGES

- o Completion date of 2nd quarter FY 1995 changed to 2nd quarter FY 1996 due to decrease in FY 1993 funding.

DEPARTMENT OF ENERGY  
 FY 1994 CONGRESSIONAL BUDGET REQUEST  
 (Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - Tiger Team Remedations

- |   |   |
|---|---|
| 1. Title and Location of Project: Hazardous Materials Safeguards, Phase I<br>Lawrence Berkeley Laboratory<br>Berkeley, California | 2a. Project No. 93-E-324<br>2b. Construction Funded   |
| 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  | 5. Previous Cost Estimate: None<br>Total Estimated Cost (TEC) -- \$5,100<br>Total Project Cost (TPC) -- \$5,160 |
| 4a. Date Physical Construction Starts: 3rd Qtr. FY 1994   |   |
| 4b. Date Construction Ends: 2nd Qtr. FY 1996  | 6. Current Cost Estimate:<br>TEC -- \$5,100<br>TPC -- \$5,160   |
| 7. <u>Financial Schedule:</u>   |   |

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
FY 1993	\$ 1,500	-1,000 a/	\$ 500	\$ 400
FY 1994	1,000	0	1,000	900
FY 1995	3,600	0	3,600	2,100
FY 1996	0	0	0	1,700

a/ Application of a portion (-\$1,000,000) of the FY 1993 programmatic general reduction of \$40,000,000.

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1.	Title and location of project: Hazardous Materials Safeguards, Phase I Lawrence Berkeley Laboratory Berkeley, California	2a. Project No. 93-E-324 2b. Construction Funded
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8. Brief Physical Description of Project

Due to budgetary constraints, this project has been stretched out from the 2nd quarter of FY 1995 to the 2nd quarter of FY 1996.

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 gross square feet (GSF) of space of which approximately 38,000 net square feet (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.

1. Title and location of project: Hazardous Materials Safeguards, Phase I Lawrence Berkeley Laboratory Berkeley, California	2a. Project No. 93-E-324 2b. Construction Funded
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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 For, 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.

10. Details of Cost Estimate a/

	<u>Item Costs</u>	<u>Total Cost</u>
a. 1. Engineering design and inspection at approximately 16 percent of construction costs, Items b.1,2.....		\$ 610
2. Project management at approximately 6 percent of construction costs.....		220
b. Construction costs.....		3,600
1. Buildings.....	3,510	
2. Removals.....	90	
Subtotal.....		4,430
c. Contingencies at approximately 15 percent of above costs.....		670
Total line item cost .....		\$ 5,100

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.

1. Title and location of project: Hazardous Materials Safeguards, Phase I Lawrence Berkeley Laboratory Berkeley, California	2a. Project No. 93-E-324 2b. Construction Funded
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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.

12. 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 funding						
1. Total facility costs						
(a) Line item .....	\$ 0	\$ 400	\$ 900	\$ 2,100	\$ 1,700	\$5,100
Total facility costs.....	\$ 0	\$ 400	\$ 900	\$ 2,100	\$ 1,700	\$5,100
b. Related annual funding						
2. Operating expenses (Conceptual Design).....	\$ 60	\$ 0	\$ 0	\$ 0	\$ 0	\$ 60
Total project cost (TPC) .....	\$ 60	\$ 400	\$ 2,570	\$ 2,130	\$ 1,700	\$5,160

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.
  2. Other project funding
    - (a) Conceptual Design Report (CDR) was accomplished in FY 1991 by LBL personnel.
    - (b) Environmental (NEPA) and Safety (SAR) documentation costs - Required for environmental evaluation and, if required, preparation of an Environmental Assessment (EA). For safety documentation, includes preparation of preliminary safety analysis documents (PSAD).
- b. Related annual funding (estimated life of project -- 40 years)
1. Facility operating costs - Includes estimated cost for maintenance, custodial service and utilities.
  2. Programs already exist that will be using this facility.



DEPARTMENT OF ENERGY  
FY 1994 CONGRESSIONAL BUDGET REQUEST

(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
(Tabular dollars in thousands. Narrative material in whole dollars.)

Multiprogram Energy Laboratories - Facilities Support  
Multiprogram Energy Laboratories - Tiger Team Remediations

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1.	Title and location of project:	Fire and Safety Systems Upgrade, Phase I Lawrence Berkeley Laboratory Berkeley, California	2a.	Project No. 93-E-323
			2b.	Construction Funded

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SIGNIFICANT CHANGES

o Completion date of 3rd quarter FY 1996 changed to 3rd quarter FY 1997 due to decrease in FY 1993 funding.

DEPARTMENT OF ENERGY  
 FY 1994 CONGRESSIONAL BUDGET REQUEST

(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - Tiger Team Remediations

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1. Title and location of project: Fire and Safety Systems Upgrade, Phase I  
 Lawrence Berkeley Laboratory  
 Berkeley, California

2a. Project No. 93-E-323  
 2b. Construction Funded

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3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 2nd Qtr. FY 1993

3b. A-E Work (Titles I & II) Duration: 28 Months

5. Previous Cost Estimate:  
 Total Estimated Cost (TEC) -- \$4,600  
 Total Project Cost (TPC) -- \$4,600

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4a. Date Physical Construction Starts: 2nd Qtr. FY 1994

4b. Date Construction Ends: 3rd Qtr. FY 1997

6. Current Cost Estimate:  
 TEC -- \$4,600  
 TPC -- \$4,630

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7. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
FY 1993	\$ 1,500	-1,000 a/	\$ 500	\$ 400
FY 1994	1,000	0	1,000	900
FY 1995	2,000	0	2,000	1,200
FY 1996	1,100	0	1,100	1,600
FY 1997	0	0	0	500

a/ Application of a portion (-\$1,000,000) of the FY 1993 programmatic general reduction of \$40,000,000.

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1. Title and Location of Project: Fire and Safety Systems Upgrade, Phase I Lawrence Berkeley Laboratory Berkeley, California	2a. Project No. 93-E-323 2b. Construction Funded
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8. Brief Physical Description of Project

Due to budgetary constraints, this project has been stretched out from the 3rd quarter of FY 1996 to the 3rd quarter FY 1997.

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.

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1. Title and location of project: Fire and Safety Systems Upgrade, Phase I Lawrence Berkeley Laboratory Berkeley, California	2a. Project No. 93-E-323 2b. Construction Funded
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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 existing 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 For, 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 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.

<b>1. Title and location of project:</b> Fire and Safety Systems Upgrade, Phase I Lawrence Berkeley Laboratory Berkeley, California	<b>2a. Project No.</b> 93-E-323 <b>2b. Construction Funded</b>
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<u>10. Details of Cost Estimate a/</u>	<u>Item Costs</u>	<u>Total Cost</u>
a. 1. Engineering design and inspection at approximately 17 percent of construction costs, Item b.....		\$ 540
2. Project management at approximately 6 percent of construction costs (Item b)....		190
b. Construction costs.....		3,200
1. Improvements to land .....	3,200	
Subtotal.....		3,930
c. Contingencies at approximately 17 percent of above costs.....		670
Total line item cost .....		\$ 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.

**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.

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

Not required on projects with a TEC of less than \$5,000,000 per draft DOE Order 5100.3a.

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

Conceptual design completed at a cost of \$30,000. Other data not required on projects with a TEC of less than \$5,000,000 per draft DOE Order 5100.3a.

DEPARTMENT OF ENERGY  
 FY 1994 CONGRESSIONAL BUDGET REQUEST

(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - Tiger Team Remediations

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1. Title and Location of Project: Fire and Safety Improvements, Phase II  
 Argonne National Laboratory  
 Argonne, Illinois

2a. Project No. 93-E-320  
 2b. Construction Funded

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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

5. Previous Cost Estimate:  
 Total Estimated Cost (TEC) -- \$5,350  
 Total Project Cost (TPC) -- \$5,462

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4a. Date Physical Construction Starts: 4th Qtr. FY 1994

6. Current Cost Estimate:  
 TEC -- \$5,350  
 TPC -- \$5,462

4b. Date Construction Ends: 4th Qtr FY 1996

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 1,870	-1,480 <sup>a/</sup>	\$ 390	\$ 100
1994	850	0	850	700
1995	2,110	0	2,110	1,600
1996	2,000	0	2,000	1,650
1997	0	0	0	1,300

<sup>a/</sup> Application of a portion (-\$1,020,000) of the FY 1993 programmatic general reduction of \$40,000,000 and proposed reallocation (-\$460,000) of FY 1993 funding consistent with requested resources in FY 1994.

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1. Title and Location of Project:	Fire and Safety Improvements, Phase II Argonne National Laboratory Argonne, Illinois	2a. Project No. 93-E-320
		2b. Construction Funded

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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.

1. Title and Location of Project: Fire and Safety Improvements, Phase II Argonne National Laboratory Argonne, Illinois	2a. Project No. 93-E-320 2b. Construction Funded
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8. Brief Physical Description of Project (Continued)

c. Fire Detection and Fire Alarm System Improvements

63 buildings 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 For, 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.



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1. Title and Location of Project: Fire and Safety Improvements, Phase II Argonne National Laboratory Argonne, Illinois	2a. Project No. 93-E-320 2b. Construction Funded
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9. Purpose, Justification of Need For, 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 at or near 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.

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1. Title and Location of Project: Fire and Safety Improvements, Phase II Argonne National Laboratory Argonne, Illinois	2a. Project No. 93-E-320 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project (Continued)

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/year 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.
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.

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1. Title and Location of Project: Fire and Safety Improvements, Phase II Argonne National Laboratory Argonne, Illinois	2a. Project No. 93-E-320 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project (Continued)

2. Automatic Sprinkler Systems (Continued)

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.

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 requires 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.

3. Antifreeze Suppression Systems

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.

1. Title and Location of Project: Fire and Safety Improvements, Phase II Argonne National Laboratory Argonne, Illinois	2a. Project No. 93-E-320 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project (Continued)

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, and 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.

5. Fire Main Extension

Installation of a new 8-inch water main on the east side of Building 202 would create a water main loop around the building. This would provide an improved and redundant water supply for automatic sprinkler systems and fire department hose streams use should a portion of the water main be broken, obstructed, or out of service. Building 202 is used for biological and medical research and has a maximum possible fire loss exceeding \$25,000,000. Provision of a redundant water supply is required by Section 1530-2.3.5 of DOE Order 6430.1A for buildings with a maximum possible fire loss exceeding \$25,000,000.

d. Construction for Fire Protection

Existing walls between 3 computer rooms and surrounding offices/areas in Buildings 201, 203, and 205 will be upgraded to provide a 1 hour fire resistance rating. DOE/EP-0108. Standard for Fire Protection of DOE Electronic Computer/Data Processing Systems requires a 1 hour rated fire separation around computer rooms which have a monetary value of \$1,000,000 or are critical to a DOE mission. The computer rooms in Buildings 201 and 205 have equipment which are considered mission critical. The computer room in Building 203 is valued at over \$1,000,000.

1. Title and Location of Project: Fire and Safety Improvements, Phase II Argonne National Laboratory Argonne, Illinois	2a. Project No. 93-E-320 2b. Construction Funded
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9. Purpose, Justification of Need For, and Scope of Project (Continued)

e. Project Delay Ramifications

Delays in project approval would leave employees of ANL exposed to undue hazards of life and safety as a result of fire and could impair continued operations of vital DOE Programs caused by extensive property damage to facilities due to fire. New programs may not be allowed to start due to lack of adequate fire alarm or suppression systems. The existing systems are not capable of required expansion to meet current and future programmatic needs.

<u>10. Details of Cost Estimate a/</u>	<u>Item Cost</u>	<u>Total Cost</u>
(a) Engineering design and inspection at approximately 12 percent of construction costs, item b.....		\$ 462
(b) Construction management at approximately 4 percent of construction costs, (item b)....		150
(c) Project management at approximately 2.5 percent 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) Contingencies at approximately 20 percent of above costs.....		<u>894</u>
Total line item cost .....		<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.

1. Title and Location of Project: Fire and Safety Improvements, Phase II  
 Argonne National Laboratory  
 Argonne, Illinois

2a. Project No. 93-E-320  
 2b. Construction Funded

12. Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	Total
a. Total project funding							
1. Total project costs							
(a) Line item .....	\$ 0	\$ 100	\$ 700	\$ 1,600	\$ 1,650	\$ 1,300	\$ 5,350
Total direct costs.....	\$ 0	\$ 100	\$ 700	\$ 1,600	\$ 1,650	\$ 1,300	\$ 5,350
2. Other project costs							
(a) Conceptual design costs.....	\$ 97	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 97
(b) Documentation costs.....	15	0	0	0	0	0	15
Total other project costs.....	\$ 112	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 112
Total project costs (TPC) .....	\$ 112	\$ 100	\$ 700	\$ 1,600	\$ 1,650	\$ 1,300	\$ 5,462
b. Related annual funding							
None.							

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

- a. Total project funding
1. Total facility costs
- (a) 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. Related annual funding

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 1994 CONGRESSIONAL BUDGET REQUEST  
(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
(Tabular dollars in thousands. Narrative material in whole dollars.)

Multiprogram Energy Laboratories - Facilities Support  
Multiprogram Energy Laboratories - Tiger Team Remediations

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1. Title and Location of Project: Life Safety Code Compliance Pacific Northwest Laboratory Richland, Washington	2a. Project No. 93-E-317 2b. Construction Funded
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SIGNIFICANT CHANGES

- o TEC increased from \$2,300,000 to \$2,400,000 due to decrease in FY 1993 appropriation.
- o TPC increased from \$2,330,000 to \$2,550,000 due to decrease in FY 1993 appropriation.

DEPARTMENT OF ENERGY  
 FY 1994 CONGRESSIONAL BUDGET REQUEST

(Changes from FY 1993 Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - Tiger Team Remediations

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1. Title and Location of Project: Life Safety Code Compliance  
 Pacific Northwest Laboratory  
 Richland, Washington
- 2a. Project No. 93-E-317  
 2b. Construction Funded
- 
- 3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 2nd Qtr. FY 1993
5. Previous Cost Estimate:  
 Total Estimated Cost (TEC) -- \$2,300  
 Total Project Cost (TPC) -- \$2,330
- 3b. A-E Work (Titles I & II) Duration: 10 Months
- 
- 4a. Date Physical Construction Starts: 1st Qtr. FY 1994
6. Current Cost Estimate:  
 TEC -- \$2,400  
 TPC -- \$2,550
- 4b. Date Construction Ends: 3rd Qtr. FY 1995
7. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 1,000	-500 a/	\$ 500	\$ 400
1994	1,000	0	1,000	750
1995	900	0	900	900
1996	0	0	0	350

a/ Application of a portion (-\$500,000) of the FY 1993 programmatic general reduction of \$40,000,000.



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1. Title and Location of Project: Life Safety Code Compliance Pacific Northwest Laboratory Richland, Washington	2a. Project No. 93-E-317 2b. Construction Funded
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8. Brief Physical Description of Project

Due to budgetary constraints, TEC increased from \$2,300,000 to \$2,400,000 and TPC increased from \$2,330,000 to \$2,550,000.

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 are 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.

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.

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1.	Title and Location of Project: Life Safety Code Compliance Pacific Northwest Laboratory Richland, Washington	2a. Project No. 93-E-317 2b. Construction Funded
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9. Purpose, Justification of Need For, 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 Code requirements will also help reduce potential property loss due to fire.

The current condition of these buildings has raised many concerns about their adequacy to continue 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.

1. Title and Location of Project: Life Safety Code Compliance  
Pacific Northwest Laboratory  
Richland, Washington

2a. Project No. 93-E-317  
2b. Construction Funded

<u>10. Details of Cost Estimate a/</u>		<u>Item Costs</u>	<u>Total Cost</u>
a.	1. Engineering design and inspection at approximately 24 percent of construction costs, Item b.....		\$ 360
	2. Project management.....		40
b.	Construction costs.....		1,500
	1. Buildings.....	\$ 1,500	
	Subtotal.....		<u>1,900</u>
c.	Contingencies at approximately 28 percent of above costs.....		500
	Total line item costs .....		<u>\$ 2,400 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.

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. Schedule of Project Funding and Other Related Funding Requirements

Not required on projects with a TEC of less than \$5,000,000 per draft DOE Order 5100.3a.

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

Not required on projects with a TEC of less than \$5,000,000 per draft DOE Order 5100.3a.

DEPARTMENT OF ENERGY  
 FY 1994 CONGRESSIONAL BUDGET REQUEST  
 (Changes from Congressional Budget Request are denoted with a vertical line in left margin.)

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT  
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Multiprogram Energy Laboratories - Facilities Support  
 Multiprogram Energy Laboratories - Tiger Team Remediations

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1. Title and Location of Project: Roof Replacement, Phase I  
 Brookhaven National Laboratory  
 Upton, New York
- 2a. Project No. 93-E-315  
 2b. Construction Funded
- 
- 3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 1st Qtr. FY 1993
5. Previous Cost Estimate:  
 Total Estimated Cost (TEC) -- \$3,130  
 Total Project Cost (TPC) -- \$3,130
- 3b. A-E Work (Title I & II) Duration: 6 Months
- 
- 4a. Date Physical Construction Starts: 3rd Qtr. FY 1993
6. Current Cost Estimate:  
 TEC -- \$ 3,130  
 TPC -- \$ 3,130
- 4b. Date Construction Ends: 4th Qtr. FY 1995
7. Financial Schedule:

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
FY 1993	\$ 1,130	-226 a/	\$ 904	\$ 600
FY 1994	1,926	0	1,926	1,530
FY 1995	300	0	300	1,000

a/ Application of a portion (-\$330,000) of the FY 1993 programmatic general reduction of \$40,000,000 and proposed reallocation (+\$104,000) of FY 1993 funding consistent with requested resources in FY 1994.

<b>1. Title and Location of Project:</b> Roof Replacement, Phase I Brookhaven National Laboratory Upton, New York	2a. Project No. 93-E-315 2b. Construction Funded
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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 systems or mechanically fastened single-ply systems suitable to the existing conditions will be installed.

**9. Purpose, Justification of Need For, 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 percent 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. Contingencies at approximately 10 percent of above costs.....		285
Total line item cost .....		<u>\$3,130</u>

**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.

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1. Title and Location of Project:	Roof Replacement, Phase I Brookhaven National Laboratory Upton, New York	2a. Project No. 93-E-315 2b. Construction Funded
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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. Schedule of Project Funding and Other Related Funding Requirements

Not required on projects with a TEC of less than \$5,000,000 per draft DOE Order 5100.3a.

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

Not required on projects with a TEC of less than \$5,000,000 per draft DOE Order 5100.3a.