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DOE/MA-0064/2
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DOE/MA--0064/2-Vol.1

DE84 009776

CONGRESSIONAL BUDGET REQUEST FY 1985 VOLUME 1

ATOMIC ENERGY DEFENSE ACTIVITIES

FEBRUARY 1984
U.S. DEPARTMENT OF ENERGY
ASSISTANT SECRETARY,
MANAGEMENT AND ADMINISTRATION
OFFICE OF THE CONTROLLER
WASHINGTON, D.C. 20585

MASTER

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DEPARTMENT OF ENERGY
FISCAL YEAR 1985 CONGRESSIONAL BUDGET REQUEST
ATOMIC ENERGY DEFENSE ACTIVITIES
VOLUME 1
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DEPARTMENT OF ENERGY
FISCAL YEAR 1985 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF ESTIMATES BY APPROPRIATIONS
(in thousands of dollars)

	FY 1983 Actual		FY 1984 Estimate		FY 1985 Request	
	BA	BO	BA	BO	BA	BO
Appropriations Before The Energy and Water Development Subcommittees:						
Energy Supply Research and Development	\$ 2,226,367	\$ 2,275,666	\$ 1,990,936	\$ 2,113,900	\$ 2,037,181	\$ 2,102,039
Uranium Enrichment	100,739	1,645,513	88,810	2,147,000	---	31,300
General Science and Research	557,853	588,921	641,250	621,450	746,105	684,316
Atomic Energy Defense Activities ..	5,732,684	5,171,202	6,560,770	6,001,550	7,805,825	7,133,084
Departmental Administration	216,292	173,741	155,269	145,306	138,575	172,003
Alaska Power Administration	3,945	3,217	3,410	4,050	3,233	3,233
Bonneville Power Administration ...	223,800	125,501	123,400	19,585	298,730	-104,500
Southeastern Power Administration .	3,964	5,902	20,594	19,566	35,744	34,480
Southwestern Power Administration .	20,756	24,135	36,229	39,240	29,208	36,268
Western Area Power Administration .	179,750	86,909	194,630	282,018	248,230	273,230
Western Area Power Emergency Fund .	337	---	500	---	---	---
Federal Energy Regulatory Commission	88,965	77,879	44,482	90,045	40,677	39,467
Nuclear Waste Fund	218,600	160,121	319,621	283,616	327,669	350,069
Geothermal Resources Development Fund	190	2,460	2,100	1,790	121	685
Special Foreign Currency	---	-143	---	---	---	---
Subtotal, Appropriations Before the Energy and Water Development Subcommittees	<u>\$ 9,574,242</u>	<u>\$10,341,024</u>	<u>\$10,182,001</u>	<u>\$11,769,116</u>	<u>\$11,711,298</u>	<u>\$10,755,674</u>

DEPARTMENT OF ENERGY
FISCAL YEAR 1985 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF ESTIMATES BY APPROPRIATIONS
(in thousands of dollars)

	FY 1983 Actual		FY 1984 Estimate		FY 1985 Request	
	BA	BO	BA	BO	BA	BO
Appropriations Before Interior and Related Agencies Subcommittees:						
Fossil Energy Research and Development	\$ 217,094	\$ 402,841	\$ 260,214	\$ 333,850	\$ 202,731	\$ 280,474
Naval Petroleum and Oil Shale Reserves	222,000	228,002	256,600	224,076	223,804	233,354
Energy Conservation	429,128	476,267	431,131	459,367	144,077	379,910
Emergency Preparedness and Energy Regulation	38,366	44,188	30,330	35,440	27,157	30,508
Strategic Petroleum Reserve	2,316,178	1,855,429	808,770	2,360,101	2,336,740	2,025,309
Energy Information Activities	54,732	67,916	57,060	58,732	57,863	61,889
Alternative Fuels Production	---	8,721	---	5,000	---	2,847
Subtotal	3,277,498	3,083,364	1,844,105	3,476,566	2,992,372	3,014,291
Less Off-Budget SPR	2,074,060	1,640,635	650,000	2,157,000	1,889,550	1,668,320
Subtotal, Interior and Related Agencies Subcommittees	1,203,438	1,442,729	1,194,105	1,319,566	1,102,822	1,345,971
Subtotal, Energy and Water Development Subcommittees	9,574,242	10,341,024	10,182,001	11,769,116	11,711,298	10,755,674
Subtotal, Department of Energy	10,777,680	11,783,753	11,376,106	13,088,682	12,814,120	12,101,645
Permanent - Indefinite Appropriations:						
Payments to States	164	1,045	570	164	570	570
Total, Department of Energy	<u>\$10,777,844</u>	<u>\$11,784,798</u>	<u>\$11,376,676</u>	<u>\$13,088,846</u>	<u>\$12,814,690</u>	<u>\$12,102,215</u>

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

MANAGEMENT INITIATIVES

The fiscal year 1985 budget request of the Department of Energy (DOE) reflects estimated savings of \$47.5 million in budget authority for FY 1984 and \$96 million in FY 1985 resulting from the implementation of a series of management initiatives. These initiatives, which are described below, are designed to improve the efficiency and effectiveness of Departmental management systems, to take advantage of economies available through increased or improved utilization of private sector capabilities, and to place the Department's financial systems on a more business-like basis. Implementation of these initiatives will not only improve current Departmental operations, but will hold out the possibility of additional savings in future years.

ADMINISTRATIVE ORGANIZATION MANAGEMENT

This initiative reflects savings of \$1.0 million in FY 1984 and \$2.5 million in FY 1985 resulting from improved planning and control of organization structures within the Department of Energy. Elements of implementation of this initiative will include guidance to managers on improved organization planning and special reviews of existing and proposed organization structures focusing on supervisor to employee ratios, reduction in the number of levels of supervision, and overall staffing resource utilization. Savings are expected to be identified in all of the larger DOE organizations, both at Headquarters and in the field.

ADMINISTRATIVE SYSTEMS

This initiative reflects savings of \$2.0 million in FY 1984 and \$4.0 million in FY 1985 resulting from improvements in automatic data processing (ADP) utilization. These savings will be achieved through improved planning for acquisition and utilization of ADP systems, close monitoring of systems operations to insure maximum utilization of existing capacity, and consolidation of operations to allow for deferral of new systems acquisitions. These reductions will be available in those program areas making the most substantial use of ADP systems in the Department.

ADMINISTRATIVE PROCESS/FIELD STRUCTURE

This initiative reflects savings of \$35.0 million in FY 1985 resulting from improved management of government owned, contractor operated (GOCO) facilities. This initiative involves improved utilization of private sector business practices by GOCO contractors through reduced procedural controls and heightened reliance on policy issuances and performance evaluation by the DOE Operations Offices. Cost initiatives for improved GOCO performance and reduction in reporting detail will lead to DOE management oversight at a higher level and to improved opportunities for innovation and implementation of new management processes by GOCO contractors. These savings will occur at all eight DOE Operations Offices and major contractors.

PAYROLL/PERSONNEL

This initiative will save \$0.3 million in FY 1985 through continued expansion of the DOE automated system PAY/PERS. This system integrates both payroll and personnel record systems and provides economies of scale as well as improved accuracy and timeliness. Continued expansion of the system to cover additional DOE organizations will result in staffing resource savings in both the personnel and payroll administration functional areas, and further savings are anticipated in future years. Savings will also result from application of more refined workload standards to personnel support functions.

PROCUREMENT REFORM

This initiative reflects savings of \$10.5 million in FY 1984 and \$18.5 million in FY 1985 through a number of actions designed to improve the utilization and administration of the procurement system. \$10 million in FY 1984 and \$15 million in FY 1985 are associated with increased use of contract audit support by the Department's Inspector General during contract administration to expand audit coverage and increase recoveries. Expanded use of private sector contractors for accomplishment of commercial and industrial activities under OMB Circular A-76 account for \$0.5 million in FY 1984 savings and \$3.0 million in FY 1985 and improve the prospects for commercialization of research results. Changes in DOE patent policy to allow non-profit GOCO contractors to own the inventions resulting from their research will save \$0.5 million in FY 1985. These savings are distributed throughout the programs and organizations of the Department.

CASH MANAGEMENT

This initiative reflects savings of \$31.7 million in outlays in each of FY 1984 and FY 1985 based on improvements in billing and collecting receipts and in the disbursement of funds. These savings will occur due to increased use of electronic fund transfers for collection in the revenue producing elements of the Department, such as the Power Marketing Administrations, and for disbursements to contractors by the Operations Offices.

FINANCIAL SYSTEMS REFORMS

This initiative will save \$34.0 million in FY 1984 and FY 1985 through improved management of the deobligation of multi-year funds. Deobligations may occur due to contract close-out, contractor defaults, or other instances of contractual dollar reductions, such as cost disallowances based on audit results. Under this initiative, such deobligations will be reported and evaluated to determine whether or not the funding should be retained in the program area where it was originally appropriated. If it is determined that there is no compelling reason to retain these funds in that program area, they will be deferred, if necessary (i.e., FY 1984 and previous years funding), and used to offset budget authority in FY 1985.

PRINTING/PUBLICATIONS

This initiative will save \$1.1 million in FY 1985 through increased utilization of commercial facilities, rather than in-house plants to acquire needed printing and duplication services. Savings will occur in DOE Headquarters, the Bonneville Power Administration, the Albuquerque Operations Office and the Technical Information Center.

TRAVEL MANAGEMENT

This initiative provides for \$0.6 million in savings for FY 1985 based on elimination of non-essential travel and the utilization of commercial travel agents rather than in-house staff. These reductions will be effected at Headquarters and at the Albuquerque, Chicago, and San Francisco Operations Offices.

U.S. DEPARTMENT OF ENERGY
MANAGEMENT INITIATIVES BUDGET
APPROPRIATION SUMMARY
(DOLLARS IN THOUSANDS)

	FY1984 BUDGET AUTHORITY	FY1984 BUDGET OUTLAYS	FY1985 BUDGET AUTHORITY	FY1985 BUDGET OUTLAYS	FY1986 BUDGET AUTHORITY	FY1986 BUDGET OUTLAYS
ENERGY & WATER DEVELOPMENT SUBCOMMITTEE						
ENERGY SUPPLY RESEARCH AND DEVELOPMENT						
ADMIN ORGANIZATION MANAGEMENT	\$ -100	\$ -100	\$ -350	\$ -350	\$ -550	\$ -550
ADMINISTRATIVE SYSTEMS	-700	-700	-1,300	-1,300	-2,000	-2,000
ADMIN PROCESS/FIELD STRUCTURE	.	.	-10,000	-10,000	-25,000	-25,000
PROCUREMENT REFORM	-2,500	-2,500	-5,250	-5,250	-5,600	-5,600
CASH MANAGEMENT	.	-4,800	.	-4,800	.	-4,800
FINANCIAL SYSTEMS REFORM	-12,000	-12,000	-12,000	-12,000	-12,000	-12,000
PRINTING/PUBLICATIONS	.	.	-300	-300	-300	-300
TOTAL ENERGY SUPPLY RESEARCH AND DEVEL	\$ -15,300	\$ -20,100	\$ -29,200	\$ -34,000	\$ -45,450	\$ -50,250
URANIUM ENRICHMENT						
ADMIN PROCESS/FIELD STRUCTURE	\$.	\$.	\$ -2,000	\$ -2,000	\$ -5,000	\$ -5,000
DEBT COLLECTION	.	.	.	0	.	0
TOTAL URANIUM ENRICHMENT	\$ 0	\$ 0	\$ -2,000	\$ -2,000	\$ -5,000	\$ -5,000
GENERAL SCIENCE AND RESEARCH						
ADMINISTRATIVE SYSTEMS	\$ -700	\$ -700	\$ -1,300	\$ -1,300	\$ -2,000	\$ -2,000
ADMIN PROCESS/FIELD STRUCTURE	.	.	-4,000	-4,000	-8,000	-8,000
CASH MANAGEMENT	.	-1,400	.	-1,400	.	-1,400
TOTAL GENERAL SCIENCE AND RESEARCH	\$ -700	\$ -2,100	\$ -5,300	\$ -6,700	\$ -10,000	\$ -11,400
ATOMIC ENERGY DEFENSE ACTIVITIES						
ADMIN ORGANIZATION MANAGEMENT	\$ -200	\$ -200	\$ -400	\$ -400	\$ -750	\$ -750
ADMINISTRATIVE SYSTEMS	-600	-600	-1,400	-1,400	-2,000	-2,000
ADMIN PROCESS/FIELD STRUCTURE	.	.	-15,000	-15,000	-30,000	-30,000
PAYROLL/PERSONNEL	.	.	-100	-100	-250	-250
PROCUREMENT REFORM	-2,750	-2,750	-6,988	-6,988	-8,350	-8,350
CASH MANAGEMENT	.	-13,900	.	-13,900	.	-13,900
FINANCIAL SYSTEMS REFORM	-7,000	-7,000	-9,000	-9,000	-9,900	-9,900
PRINTING/PUBLICATIONS	.	.	-100	-100	-100	-100
TRAVEL MANAGEMENT	.	.	-50	-50	-50	-50
TOTAL ATOMIC ENERGY DEFENSE ACTIVITIES	\$ -10,550	\$ -24,450	\$ -33,038	\$ -46,938	\$ -51,400	\$ -65,300
DEPARTMENTAL ADMINISTRATION						
ADMIN ORGANIZATION MANAGEMENT	\$ -300	\$ -300	\$ -884	\$ -884	\$ -2,250	\$ -2,250
ADMIN PROCESS/FIELD STRUCTURE	.	.	-800	-800	-1,500	-1,500
PAYROLL/PERSONNEL	.	.	-150	-150	-450	-450
PROCUREMENT REFORM	-75	-75	-362	-362	-700	-700
FINANCIAL SYSTEMS REFORM	-4,000	-4,000	-2,000	-2,000	-4,100	-4,100
PRINTING/PUBLICATIONS	.	.	-200	-200	-200	-200
TRAVEL MANAGEMENT	.	.	-550	-550	-550	-550
TOTAL DEPARTMENTAL ADMINISTRATION	\$ -4,375	\$ -4,375	\$ -4,946	\$ -4,946	\$ -9,750	\$ -9,750

U.S. DEPARTMENT OF ENERGY
MANAGEMENT INITIATIVES BUDGET
APPROPRIATION SUMMARY
(DOLLARS IN THOUSANDS)

	FY1987 BUDGET AUTHORITY	FY1987 BUDGET OUTLAYS	FY1988 BUDGET AUTHORITY	FY1988 BUDGET OUTLAYS	FY1989 BUDGET AUTHORITY	FY1989 BUDGET OUTLAYS
ENERGY & WATER DEVELOPMENT SUBCOMMITTEE						
ENERGY SUPPLY RESEARCH AND DEVELOPMENT						
ADMIN ORGANIZATION MANAGEMENT	\$ -600	\$ -600	\$ -600	\$ -600	\$ -600	\$ -600
ADMINISTRATIVE SYSTEMS	-2,600	-2,600	-3,300	-3,300	-4,000	-4,000
ADMIN PROCESS/FIELD STRUCTURE	-25,000	-25,000	-25,000	-25,000	-25,000	-25,000
PROCUREMENT REFORM	-5,900	-5,900	-5,900	-5,900	-5,900	-5,900
CASH MANAGEMENT	.	.	.	.	.	.
FINANCIAL SYSTEMS REFORM	-12,000	-12,000	-12,000	-12,000	-12,000	-12,000
PRINTING/PUBLICATIONS	-300	-300	-300	-300	-300	-300
TOTAL ENERGY SUPPLY RESEARCH AND DEVELOPMENT	\$ -46,400	\$ -46,400	\$ -47,100	\$ -47,100	\$ -47,800	\$ -47,800
URANIUM ENRICHMENT						
ADMIN PROCESS/FIELD STRUCTURE	\$ -5,000	\$ -5,000	\$ -5,000	\$ -5,000	\$ -5,000	\$ -5,000
DEBT COLLECTION	.	-25,000	.	-25,000	.	-25,000
TOTAL URANIUM ENRICHMENT	\$ -5,000	\$ -30,000	\$ -5,000	\$ -30,000	\$ -5,000	\$ -30,000
GENERAL SCIENCE AND RESEARCH						
ADMINISTRATIVE SYSTEMS	\$ -2,700	\$ -2,700	\$ -3,300	\$ -3,300	\$ -4,000	\$ -4,000
ADMIN PROCESS/FIELD STRUCTURE	-8,000	-8,000	-8,000	-8,000	-8,000	-8,000
CASH MANAGEMENT	.	.	.	.	.	.
TOTAL GENERAL SCIENCE AND RESEARCH	\$ -10,700	\$ -10,700	\$ -11,300	\$ -11,300	\$ -12,000	\$ -12,000
ATOMIC ENERGY DEFENSE ACTIVITIES						
ADMIN ORGANIZATION MANAGEMENT	\$ -1,050	\$ -1,050	\$ -1,050	\$ -1,050	\$ -1,050	\$ -1,050
ADMINISTRATIVE SYSTEMS	-2,700	-2,700	-3,400	-3,400	-4,000	-4,000
ADMIN PROCESS/FIELD STRUCTURE	-30,000	-30,000	-30,000	-30,000	-30,000	-30,000
PAYROLL/PERSONNEL	-300	-300	-300	-300	-300	-300
PROCUREMENT REFORM	-8,500	-8,500	-8,500	-8,500	-8,500	-8,500
CASH MANAGEMENT	.	.	.	.	.	.
FINANCIAL SYSTEMS REFORM	-9,900	-9,900	-9,900	-9,900	-9,900	-9,900
PRINTING/PUBLICATIONS	-100	-100	-100	-100	-100	-100
TRAVEL MANAGEMENT	-50	-50	-50	-50	-50	-50
TOTAL ATOMIC ENERGY DEFENSE ACTIVITIES	\$ -52,600	\$ -52,600	\$ -53,300	\$ -53,300	\$ -53,900	\$ -53,900
DEPARTMENTAL ADMINISTRATION						
ADMIN ORGANIZATION MANAGEMENT	\$ -3,150	\$ -3,150	\$ -3,150	\$ -3,150	\$ -3,150	\$ -3,150
ADMIN PROCESS/FIELD STRUCTURE	-1,500	-1,500	-1,500	-1,500	-1,500	-1,500
PAYROLL/PERSONNEL	-700	-700	-700	-700	-700	-700
PROCUREMENT REFORM	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000
FINANCIAL SYSTEMS REFORM	-4,100	-4,100	-4,100	-4,100	-4,100	-4,100
PRINTING/PUBLICATIONS	-200	-200	-200	-200	-200	-200
TRAVEL MANAGEMENT	-550	-550	-550	-550	-550	-550
TOTAL DEPARTMENTAL ADMINISTRATION	\$ -11,200	\$ -11,200	\$ -11,200	\$ -11,200	\$ -11,200	\$ -11,200

U.S. DEPARTMENT OF ENERGY
MANAGEMENT INITIATIVES BUDGET
APPROPRIATION SUMMARY
(DOLLARS IN THOUSANDS)

	FY1984 BUDGET AUTHORITY	FY1984 BUDGET OUTLAYS	FY1985 BUDGET AUTHORITY	FY1985 BUDGET OUTLAYS	FY1986 BUDGET AUTHORITY	FY1986 BUDGET OUTLAYS
BONNEVILLE POWER ADMINISTRATION						
ADMIN ORGANIZATION MANAGEMENT	\$ -100	\$ -100	\$ -364	\$ -364	\$ -700	\$ -700
PAYROLL/PERSONNEL	.	.	.	.	-200	-200
PROCUREMENT REFORM	-115	-115	-540	-540	-2,750	-2,750
CASH MANAGEMENT	.	-10,000	.	-10,000	.	-14,600
DEBT COLLECTION	.	.	.	0	.	0
PRINTING/PUBLICATIONS	0	.	-500	-500	-500	-500
TOTAL BONNEVILLE POWER ADMINISTRATION	\$ -215	\$ -10,215	\$ -1,404	\$ -11,404	\$ -4,150	\$ -18,750
SOUTHWESTERN POWER ADMINISTRATION						
ADMIN ORGANIZATION MANAGEMENT	\$ -50	\$ -50	\$ -52	\$ -52	\$ -50	\$ -50
PROCUREMENT REFORM	-10	-10	-180	-180	-200	-200
DEBT COLLECTION	.	.	.	0	.	0
TOTAL SOUTHWESTERN POWER ADMINISTRATION	\$ -60	\$ -60	\$ -232	\$ -232	\$ -250	\$ -250
WESTERN AREA POWER ADMINISTRATION						
ADMIN ORGANIZATION MANAGEMENT	\$ -50	\$ -50	\$ -200	\$ -200	\$ -400	\$ -400
PAYROLL/PERSONNEL	.	.	-50	-50	-100	-100
PROCUREMENT REFORM	-50	-50	-120	-120	-130	-130
TOTAL WESTERN AREA POWER ADMINISTRATION	\$ -100	\$ -100	\$ -370	\$ -370	\$ -630	\$ -630
NUCLEAR WASTE FUND						
ADMIN PROCESS/FIELD STRUCTURE	\$.	\$.	\$ -3,200	\$ -3,200	\$ -5,500	\$ -5,500
CASH MANAGEMENT	.	-1,600	.	-1,600	.	-1,600
TOTAL NUCLEAR WASTE FUND	\$ 0	\$ -1,600	\$ -3,200	\$ -4,800	\$ -5,500	\$ -7,100
TOTAL ENERGY & WATER DEVELOPMENT SUBC	\$ -31,300	\$ -63,000	\$ -79,690	\$ -111,390	\$ -132,130	\$ -168,430

U.S. DEPARTMENT OF ENERGY
MANAGEMENT INITIATIVES BUDGET
APPROPRIATION SUMMARY
(DOLLARS IN THOUSANDS)

	FY1987 BUDGET AUTHORITY	FY1987 BUDGET OUTLAYS	FY1988 BUDGET AUTHORITY	FY1988 BUDGET OUTLAYS	FY1989 BUDGET AUTHORITY	FY1989 BUDGET OUTLAYS
BONNEVILLE POWER ADMINISTRATION						
ADMIN ORGANIZATION MANAGEMENT	\$ -950	\$ -950	\$ -950	\$ -950	\$ -950	\$ -950
PAYROLL/PERSONNEL	-300	-300	-300	-300	-300	-300
PROCUREMENT REFORM	-3,000	-3,000	-3,000	-3,000	-3,000	-3,000
CASH MANAGEMENT	.	.	.	.	.	.
DEBT COLLECTION	.	-16,000	.	-16,000	.	-16,000
PRINTING/PUBLICATIONS	-500	-500	-500	-500	-500	-500
TOTAL BONNEVILLE POWER ADMINISTRATION	\$ -4,750	\$ -20,750	\$ -4,750	\$ -20,750	\$ -4,750	\$ -20,750
SOUTHWESTERN POWER ADMINISTRATION						
ADMIN ORGANIZATION MANAGEMENT	\$ -100	\$ -100	\$ -100	\$ -100	\$ -100	\$ -100
PROCUREMENT REFORM	-200	-200	-200	-200	-200	-200
DEBT COLLECTION	.	-16,000	.	-16,000	.	-16,000
TOTAL SOUTHWESTERN POWER ADMINISTRATION	\$ -300	\$ -16,300	\$ -300	\$ -16,300	\$ -300	\$ -16,300
WESTERN AREA POWER ADMINISTRATION						
ADMIN ORGANIZATION MANAGEMENT	\$ -450	\$ -450	\$ -450	\$ -450	\$ -450	\$ -450
PAYROLL/PERSONNEL	-100	-100	-100	-100	-100	-100
PROCUREMENT REFORM	-130	-130	-330	-330	-330	-330
TOTAL WESTERN AREA POWER ADMINISTRATION	\$ -680	\$ -680	\$ -880	\$ -880	\$ -880	\$ -880
NUCLEAR WASTE FUND						
ADMIN PROCESS/FIELD STRUCTURE	\$ -5,500	\$ -5,500	\$ -5,500	\$ -5,500	\$ -5,500	\$ -5,500
CASH MANAGEMENT	.	.	.	.	.	.
TOTAL NUCLEAR WASTE FUND	\$ -5,500	\$ -5,500	\$ -5,500	\$ -5,500	\$ -5,500	\$ -5,500
TOTAL ENERGY & WATER DEVELOPMENT SUBC	\$ -137,130	\$ -194,130	\$ -139,330	\$ -196,330	\$ -141,330	\$ -198,330

U.S. DEPARTMENT OF ENERGY
MANAGEMENT INITIATIVES BUDGET
APPROPRIATION SUMMARY
(DOLLARS IN THOUSANDS)

	FY1984 BUDGET AUTHORITY	FY1984 BUDGET OUTLAYS	FY1985 BUDGET AUTHORITY	FY1985 BUDGET OUTLAYS	FY1986 BUDGET AUTHORITY	FY1986 BUDGET OUTLAYS
INTERIOR & RELATED AGENCIES SUBCOMMITTEE						
FOSSIL ENERGY RESEARCH AND DEVELOPMENT						
ADMIN ORGANIZATION MANAGEMENT	\$ -150	\$ -150	\$ -150	\$ -150	\$ -300	\$ -300
PAYROLL/PERSONNEL	.	.	.	.	.	.
PROCUREMENT REFORM	.	.	-60	-60	-70	-70
FINANCIAL SYSTEMS REFORM	-6,000	-6,000	-6,000	-6,000	-6,000	-6,000
TOTAL FOSSIL ENERGY RESEARCH AND DEVEL	\$ -6,150	\$ -6,150	\$ -6,210	\$ -6,210	\$ -6,370	\$ -6,370
NAVAL PETROLEUM AND OIL SHALE RESERVES						
ADMIN ORGANIZATION MANAGEMENT	\$ -50	\$ -50	\$ -30	\$ -30	\$ -100	\$ -100
TOTAL NAVAL PETROLEUM AND OIL SHALE RE	\$ -50	\$ -50	\$ -30	\$ -30	\$ -100	\$ -100
ENERGY CONSERVATION						
FINANCIAL SYSTEMS REFORM	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000
TOTAL ENERGY CONSERVATION	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000
STRATEGIC PETROLEUM RESERVE						
PROCUREMENT REFORM	\$ -5,000	\$ -5,000	\$ -5,000	\$ -5,000	\$ -5,000	\$ -5,000
FINANCIAL SYSTEMS REFORM	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000
TOTAL STRATEGIC PETROLEUM RESERVE	\$ -6,000	\$ -6,000	\$ -6,000	\$ -6,000	\$ -6,000	\$ -6,000
ENERGY INFORMATION ACTIVITIES						
ADMIN ORGANIZATION MANAGEMENT	\$.	\$.	\$ -70	\$ -70	\$ -200	\$ -200
PROCUREMENT REFORM	.	.	.	.	-200	-200
TOTAL ENERGY INFORMATION ACTIVITIES	\$ 0	\$ 0	\$ -70	\$ -70	\$ -400	\$ -400
TOTAL INTERIOR & RELATED AGENCIES SUB	\$ -16,200	\$ -16,200	\$ -16,310	\$ -16,310	\$ -16,870	\$ -16,870
TOTAL DEPARTMENT	\$ -47,500	\$ -79,200	\$ -96,000	\$ -127,700	\$ -149,000	\$ -185,300

U.S. DEPARTMENT OF ENERGY
MANAGEMENT INITIATIVES BUDGET
APPROPRIATION SUMMARY
(DOLLARS IN THOUSANDS)

	FY1987 BUDGET AUTHORITY	FY1987 BUDGET OUTLAYS	FY1988 BUDGET AUTHORITY	FY1988 BUDGET OUTLAYS	FY1989 BUDGET AUTHORITY	FY1989 BUDGET OUTLAYS
INTERIOR & RELATED AGENCIES SUBCOMMITTEE						
FOSSIL ENERGY RESEARCH AND DEVELOPMENT						
ADMIN ORGANIZATION MANAGEMENT	\$ -450	\$ -450	\$ -450	\$ -450	\$ -450	\$ -450
PAYROLL/PERSONNEL	-100	-100	-100	-100	-100	-100
PROCUREMENT REFORM	-70	-70	-70	-70	-70	-70
FINANCIAL SYSTEMS REFORM	-6,000	-6,000	-6,000	-6,000	-6,000	-6,000
TOTAL FOSSIL ENERGY RESEARCH AND DEVEL	\$ -6,620	\$ -6,620	\$ -6,620	\$ -6,620	\$ -6,620	\$ -6,620
NAVAL PETROLEUM AND OIL SHALE RESERVES						
ADMIN ORGANIZATION MANAGEMENT	\$ -100	\$ -100	\$ -100	\$ -100	\$ -100	\$ -100
TOTAL NAVAL PETROLEUM AND OIL SHALE RE	\$ -100	\$ -100	\$ -100	\$ -100	\$ -100	\$ -100
ENERGY CONSERVATION						
FINANCIAL SYSTEMS REFORM	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000
TOTAL ENERGY CONSERVATION	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000	\$ -4,000
STRATEGIC PETROLEUM RESERVE						
PROCUREMENT REFORM	\$ -5,000	\$ -5,000	\$ -5,000	\$ -5,000	\$ -5,000	\$ -5,000
FINANCIAL SYSTEMS REFORM	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000
TOTAL STRATEGIC PETROLEUM RESERVE	\$ -6,000	\$ -6,000	\$ -6,000	\$ -6,000	\$ -6,000	\$ -6,000
ENERGY INFORMATION ACTIVITIES						
ADMIN ORGANIZATION MANAGEMENT	\$ -250	\$ -250	\$ -250	\$ -250	\$ -250	\$ -250
PROCUREMENT REFORM	-200	-200	-200	-200	-200	-200
TOTAL ENERGY INFORMATION ACTIVITIES	\$ -450	\$ -450	\$ -450	\$ -450	\$ -450	\$ -450
TOTAL INTERIOR & RELATED AGENCIES SUB	\$ -17,170	\$ -17,170	\$ -17,170	\$ -17,170	\$ -17,170	\$ -17,170
TOTAL DEPARTMENT	\$ -154,300	\$ -211,300	\$ -156,500	\$ -213,500	\$ -158,500	\$ -215,500

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET STAFFING
TOTAL WORKFORCE

	FY 1983 ACTUAL TOTAL	FY 1984 PASSBOOK TOTAL	FY 1985 PASSBOOK TOTAL
ENERGY AND WATER DEVELOPMENT SUBCOM:			
HEADQUARTERS	4,927	4,905	4,836
FIELD	9,402	9,587	9,277

SUBTOTAL	14,329	14,492	14,113
INTERIOR SUBCOMMITTEE:			
HEADQUARTERS	1,302	1,281	1,172
FIELD	1,353	1,149	922

SUBTOTAL	2,655	2,430	2,094
TOTAL DEPARTMENT OF ENERGY:			
HEADQUARTERS	6,229	6,186	6,008
FIELD	10,755	10,736	10,199

DOE TOTAL	16,984	16,922	16,207
LESS DIFFERENCE		165	165

OMB ALLOWANCE/GUIDANCE	16,984	16,757	16,042

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET STAFFING
TOTAL WORKFORCE

	FY 1983 ACTUAL TOTAL	FY 1984 PASSBOOK TOTAL	FY 1985 PASSBOOK TOTAL
10XXXX ENERGY SUPPLY R & D	1,152	1,045	948
ESRD HEADQUARTERS	784	680	639
ESRD FIELD	368	365	309
15XXXX URANIUM ENRICHMENT	98	69	69
UE HEADQUARTERS	50	58	58
UE FIELD	48	11	11
20XXXX GENERAL SCIENCE & RESEARCH	33	35	35
25XXXX ATOMIC ENERGY DEV ACTIVITIES	2,576	2,642	2,564
AEDA HEADQUARTERS	463	505	506
AEDA FIELD	2,113	2,137	2,058
30XXXX DEPARTMENTAL ADMINISTRATION	3,580	3,444	3,352
DA HEADQUARTERS	1,942	1,782	1,728
DA FIELD	1,638	1,662	1,624
34XXXX ALASKA PA	38	38	38
36XXXX BONNEVILLE PA	3,562	3,629	3,499
38XXXX SOUTHEASTERN PA	37	41	41
42XXXX SOUTHWESTERN PA	190	187	178
WESTERN AREA PA	1,363	1,412	1,408
46XXXX WAPA POWER MARKETING	1,145	1,190	1,186
50XXXX WAPA COLORADO RIVER BASIN	218	222	222
52XXXX FED ENERGY REGULATORY COMM	1,586	1,742	1,742
54XXXX NUCLEAR WASTE FUND	110	204	236
NWF HEADQUARTERS	67	101	127
NWF FIELD	43	103	109
56XXXX GEOTHERMAL RESOURCES DEV FUND	2	2	1
65XXXX FUSSIL ENERGY R & D	932	737	637
FERD HEADQUARTERS	143	157	127
FERD FIELD	789	580	510
70XXXX NAVAL PETROL & OIL SHALE RES	105	119	119
NPUSH HEADQUARTERS	22	25	25
NPUSH FIELD	83	94	94
75XXXX ENERGY CONSERVATION	340	352	298
EC HEADQUARTERS	210	227	187
EC FIELD	130	125	111
80XXXX EMERG PREP & ENERGY REG	600	521	369
EPER HEADQUARTERS	414	350	341
EPER FIELD	186	171	28
85XXXX STRATEGIC PETROL RESERVE	198	200	200
SPR HEADQUARTERS	49	37	37
SPR FIELD	149	163	163
90XXXX ENERGY INFO ACTIVITIES	480	501	471
EIA HEADQUARTERS	464	485	455
EIA FIELD	16	16	16
94XXXX ADVANCES FOR COOP WORK	2	2	2
TOTAL DOE APPROPRIATIONS	16,984	16,422	16,207
LESS DIFFERENCE		165	165
OMB ALLOWANCE/GUIDANCE	16,984	16,757	16,042

Department of Energy
Proposed Appropriation Language
Atomic Energy Defense Activities

Total obligations to be incurred (excluding work performed on a reimbursable basis) in carrying out atomic energy defense activities, including the purchase, construction and acquisition of plant and capital equipment and other expenses incidental thereto, shall not exceed \$7,830,375,000, to remain available until expended, including such sums as may be available from prior year obligations recovered during Fiscal Years 1984 and 1985: Provided, That, unobligated prior year balances which were programmed for use in Fiscal Year 1984 and are obligated for the same use in Fiscal Year 1985 are not included in the obligational limitation above: Provided further, That deobligated amounts may be reobligated in the same manner as restorations of prior year balances without regard to the obligational limitation above: Provided further, That of the amount provided above, not less than \$1,050,000 shall be derived from unobligated prior year appropriations under this head: Provided further, That obligations authorized herein shall be available for the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction, or expansion, purchase of passenger motor vehicles (not to exceed 354 of which 339 are for replacement only) including 35 police-type vehicles; and purchase of one aircraft.

[For expenses of the Department of Energy activities including the purchase, construction and acquisition of plant and capital equipment and other expenses incidental thereto necessary for atomic energy defense activities in carrying out the purposes of the Department of Energy Organization Act (Public Law 95-91), including the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction, or expansion; purchase of passenger motor vehicles (not to exceed 333 of which 323 are for replacement only) including 7 police-type vehicles; purchase of one helicopter, \$6,547,875,000, to remain available until expended: Provided, That notwithstanding any other provision of law, no funds may be obligated or expended after the date of enactment of this Act for Project 82-D-109 unless the President certifies to Congress that--

(1) for each 155 mm nuclear weapon produced an existing 155 mm nuclear weapon shall be removed from the stockpile and permanently dismantled; and

(2) formal notification has been received from the North Atlantic Treaty Organization nation in which such weapons are sought to be deployed that such nation has approved replacement of existing 155mm nuclear weapons with the new 155mm nuclear weapon.

None of the funds appropriated by this Act, or by any other Act, or by any other provision of law shall be available for the purpose of restarting the L-Reactor at the Savannah River Plant, Aiken, South Carolina, until the Department of Energy completes an Environmental Impact Statement pursuant to section 102(2)(C) of the National Environmental Policy Act of 1969 and until issued a discharge permit pursuant to the Federal Water Pollution Control Act (33 U.S.C. 1251, et seq.) as amended, which permit shall incorporate the terms and conditions provided in the Memorandum of Understanding entered into between the Department of Energy and the State of South Carolina dated April 27, 1983,

relating to studies and mitigation programs associated with such restart. For purposes of this paragraph the term "restarting" shall mean any activity related to the operation of the L-Reactor that would achieve criticality, generate fission products within the reactor, discharge cooling water from nuclear operations directly or indirectly into Steel Creek, or result in cooling system testing discharges which exceed the volume, frequency and duration of test discharges conducted prior to June 28, 1983.]

[Consistent with the National Environmental Policy Act of 1969, and in consultation with State officials of South Carolina and Georgia, the preparation and completion of the Environmental Impact Statement called for in the preceding paragraph shall be expedited. The Secretary of Energy may reduce the public comment period, except that such period shall not be reduced to less than thirty days, and the Secretary shall provide his Record of Decision, based upon the completed Environmental Impact Statement not sooner than December 1, 1983 and not later than January 1, 1984.] (Energy and Water Development Appropriations Act, 1984)

[For an additional amount for "Atomic Energy Defense Activities", for Project 77-13-f, \$57,000,000, to remain available until expended.

Of the funds appropriated for "Atomic Energy Defense Activities" in Public Law 98-50, an amount shall be made available to purchase 2 additional helicopters.]

[TERMINATION OF THE USE OF CERTAIN SEEPAGE BASINS]

[Of the funds heretofore appropriated for "Atomic Energy Defense Activities", \$30,000,000 is to be made available for use by the Secretary of Energy--

(1) to terminate, within 24 months after the date of enactment of this Act, the use of seepage basins associated with the fuel fabrication area at the Savannah River Plant, Aiken, South Carolina; and

(2) to submit to the appropriate committees of Congress, within 6 months after the date of enactment of this Act, a plan for the protection of groundwater at the Savannah River Plant which shall include--

(A) proposed methods for discontinuing the use of seepage basins associated with the materials processing areas;

(B) provisions for the implementation of other actions appropriate to mitigate any significant adverse effects of on-site or off-site groundwater and of chemical contaminants in seepage basins and adjacent areas, including the removal of such contaminants where necessary, and

(C) provisions for continuing the expanded monitoring program of groundwater impacts involving the appropriate South Carolina agencies in accordance with the statutory responsibilities of such agencies.]

[Rescission]

[Of the funds appropriated for "Atomic Energy Defense Activities" in Public Law 98-50 for Project 82-D-109, 155mm artillery fired atomic projectile, \$50,000,000 are rescinded.] (Energy and Water Development Supplemental Appropriations Act, 1984)

DEPARTMENT OF ENERGY
FISCAL YEAR 1985 CONGRESSIONAL BUDGET REQUEST
AMOUNTS AVAILABLE FOR OBLIGATION
ATOMIC ENERGY DEFENSE ACTIVITIES
BUDGET AUTHORITY IN THOUSANDS OF DOLLARS

	<u>FY 1984</u>	<u>FY 1985</u>
Appropriation	\$ 6,554,875	\$ 7,805,825
Proposed FY 1984 Supplemental	157,600	---
Comparative Transfer from:		
Energy Supply Research & Development - OE ...	9,270	---
Comparative Transfer to:		
General Science and Research - OE	-3,000	---
Nuclear Waste Fund - OE	<u>-375</u>	<u>---</u>
Subtotal	<u>5,895</u>	<u>---</u>
Subtotal, Budget Authority	6,718,370	7,805,825
Receipts and Reimbursements:		
Offsetting Collections from Federal Funds ...	688,395	1,200,000
Recovery of Prior Year Obligations	9,500	14,000
Unobligated Balance, Start of Year	629,041	10,550
Unobligated Balance, End of Year	<u>-10,550</u>	<u>---</u>
Total Obligations	<u>\$ 8,034,756</u>	<u>\$ 9,030,375</u>

DEPARTMENT OF ENERGY
FISCAL YEAR 1985 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF ESTIMATES BY APPROPRIATION BY MAJOR ACTIVITY
ATOMIC ENERGY DEFENSE ACTIVITIES

BUDGET AUTHORITY IN THOUSANDS OF DOLLARS

	<u>FY 1983 Actual</u>	<u>FY 1984 Estimate</u>	<u>FY 1985 Request</u>
Research and Development and Testing	\$1,185,420	\$1,409,300	\$1,723,175
Inertial Confinement Fusion	189,750	169,700	138,000
Production and Surveillance	1,916,645	2,136,725	2,621,700
Program Direction - Weapons	54,371	57,495	60,229
Verification and Control Technology .	53,900	67,850	76,700
Materials Production	1,319,899	1,621,700	1,864,200
Defense Waste and By-Products Management	518,729	681,100	752,771
Nuclear Safeguards and Security	47,360	52,000	62,700
Security Investigations	28,500	29,500	34,000
Naval Reactors Development	<u>417,910</u>	<u>493,000</u>	<u>496,900</u>
Subtotal, Atomic Energy Defense Activities	5,732,684	6,718,370	7,830,375
Proposed Program Supplemental	---	-157,600	---
Savings from Management Initiatives .	<u>---</u>	<u>---</u>	<u>-24,550</u>
Total, Atomic Energy Defense Activities	<u>\$5,732,684</u>	<u>\$6,560,770</u>	<u>\$7,805,825</u>

FY 1985 CONGRESSIONAL BUDGET REQUEST
PROGRAM OVERVIEW
Atomic Energy Defense Activities

The Department's Atomic Energy Defense Activities include seven programs. The goal of these programs is to accomplish research and development, testing, production and life-time surveillance of safe and reliable nuclear weapons to meet national defense needs, data collection and evaluation, defense, security, and nonproliferation activities. The seven programs are summarized below.

Weapons Activities

This program provides for the research, development, engineering, testing, and production of all U.S. nuclear weapons; maintenance of reliable weapons for their stockpile life; retirement and disposal of nuclear weapons from the stockpile; and the program support function that includes community assistance payments and salaries and related expenses of federal employees who manage and administer program activities. In FY 1985, the weapons program will continue to provide new technology to maintain a modern nuclear force, along with the design and development of new weapon systems in response to defense requirements. Increases are provided for continued production of weapon systems.

In FY 1985, the research, development, and testing effort will continue to explore and provide technologies necessary to maintain the U.S. nuclear forces and design and develop new weapon systems in response to defense requirements. Major objectives in the research, development, and testing area include maintaining the capability to design, test, and certify new weapons required for national defense; advancing the state-of-the-art of nuclear weapons technology to assure that the U.S. is in the forefront of all technological initiatives, and monitoring the nuclear weapons stockpile to assure continued reliability and effectiveness. Efforts to explore new concepts will be accelerated within the nuclear weapons technology base and the effort to revitalize the test complex facilities and equipment base will be expanded to include the weapon laboratory facilities.

The inertial confinement fusion program will continue to support efforts to build a base of physics understanding required for weapons design technology and target design requirements for ignition. The data obtained by experiments will support an evaluation in the FY 1987 time frame for further contributions to weapon physics research and for possible development of inertial fusion as a future energy source.

The major objectives of the production and surveillance program are to continue to: produce and deliver new warheads, projectiles, and bombs for the U.S. nuclear weapons stockpile; provide and maintain modern manufacturing capabilities and capacities required for future production of weapons for enhancement of U.S. nuclear forces; and to maintain the U.S. nuclear weapons stockpile in a high state of readiness and reliability. The FY 1985 program supports the requirements of the Nuclear Weapons Stockpile Memorandum approved by the President.

Verification and Control Technology

The goal of this program is to conduct the research, development, test, and support activities related to the detection of nuclear test activities in response to treaty verification and national security requirements; to provide the Department's expertise to significant nuclear intelligence, export control and arms control issues; and to review export license applications as required by the Atomic Energy Act as amended, the Nuclear Nonproliferation Act of 1978, and the Export Administration Act of 1979. The FY 1985 budget request emphasizes the fabrication, demonstration, and deployment of both research and operational verification systems.

Materials Production

The materials production program provides nuclear materials to meet near-term requirements for a national defense, Departmental research and development programs, other government agencies, industry, and for processing of naval reactor spent fuels. The FY 1985 budget will allow the Department to continue to operate necessary production, processing, and support facilities and continue to sustain a base production program capable of meeting long-term nuclear materials production requirements consistent with the annual Nuclear Weapons Stockpile Memorandum approved by the President and the annual Department of Energy Materials Management Plan. Efforts will continue to ensure that the production facilities will be operated in a safe, secure, and environmentally acceptable manner.

Defense Waste and Byproducts Management

The defense waste and byproducts management program provides for the safe interim storage or utilization of nuclear wastes and byproducts generated primarily from nuclear materials production and naval propulsion while continuing the development of technologies and facilities for the final disposal of defense nuclear waste.

The primary program elements: interim waste operations, long-term waste management technology, and terminal storage provide mainly for the handling and disposal of low-level and airborne radioactive waste, the storage of transuranic and high-level waste, development of technology for the long-term management of radioactive waste, and the demonstration of the safe disposal of defense waste. The FY 1985 request supports the implementation of the policies contained in the Defense Waste Management Plan which was prepared in response to PL 97-90 and signed by the President on June 16, 1983.

Nuclear Safeguards and Security

This program is responsible for developing measures to assure adequate protection of the Department of Energy's nuclear weapons, nuclear materials, facilities, and classified information against theft and sabotage. The program also provides safeguards-related technical support to U.S. and international activities designed to minimize the proliferation of nuclear weapons. The FY 1985 budget request will permit continuation of these vital program activities.

Security Investigations

The objective of the security investigations program is to insure that the common defense and security of the U.S. is protected by an adequate background investigation and screening of those Department of Energy and Department contractor personnel who would, in the performance of their work, need access to Restricted Data, National Security Information or Special Nuclear Material, or who would occupy a designated Critical Sensitive position. Approximately 31,130 security investigations will be conducted in FY 1985.

Naval Reactors

The naval reactors development program is responsible for carrying out nuclear propulsion development work essential to the U.S. Navy and for maintaining the security of the U.S. Nuclear propulsion provides the Navy with ships having virtually unlimited high speed endurance and freedom from the logistics umbilical cord for propulsion fuel. This greatly reduces vulnerability to enemy action and allows ships to be designed with greatly increased capability for sustained combat operations. The program provides for the design, development, testing, and evaluation of improved naval nuclear propulsion plants and reactor cores having long fuel life, high reliability, improved performance, and simplified operating and maintenance requirements. The nuclear propulsion plants and cores cover a wide range of configurations and power ratings suitable for installation in naval combatants varying in size from small submarines to large surface ships. The ultimate objective is to develop reactor cores that will last the lifetime of the ship. In FY 1985, the ongoing research, development, and test efforts will continue.

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DEPARTMENT OF ENERGY
FISCAL YEAR 1985 CONGRESSIONAL BUDGET REQUEST
ATOMIC ENERGY DEFENSE ACTIVITIES

VOLUME 1

Weapons Activities

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Department of Energy
FY 1985 Congressional Budget Request
LEAD TABLE
Weapons Activities
Atomic Energy Defense Activities
(Tabular dollars in thousands. Narrative material in whole dollars.)

	<u>FY 1983</u> <u>Appropriation</u>	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Base</u>	<u>FY 1985</u> <u>Budget</u> <u>Request</u>
<u>Weapons Activities (DP)</u>				
<u>Research, Development,</u> <u>and Testing</u>				
Operating expenses	\$1,050,420 a/	\$1,213,100 e/	\$1,213,165	\$1,363,625
Capital equipment	93,000	108,400	108,400	127,450
Construction	42,000	87,800 f/	87,800	232,100
Subtotal	\$1,185,420	\$1,409,300	\$1,409,365	\$1,723,175
<u>Inertial Confinement</u> <u>Fusion</u>				
Operating expenses	\$ 140,000	\$ 145,000	\$ 145,000	\$ 125,000
Capital equipment	11,000	11,800	11,800	9,500
Construction	38,750	12,900	12,900	3,500
Subtotal	\$ 189,750	\$ 169,700	\$ 169,700	\$ 138,000
<u>Production & Surveillance</u>				
Operating expenses	\$1,472,145 b/	\$1,686,125 g/	\$1,687,095	\$1,947,900
Capital equipment	92,000	106,400	106,400	134,400
Construction	352,700 c/	344,200 h/	344,200	539,400
Subtotal	\$1,916,845	\$2,136,725	\$2,137,695	\$2,621,700
<u>Program Direction</u>				
Operating expenses	\$ 54,371 d/	\$ 57,495 i/	\$ 59,063	\$ 60,229
Subtotal	\$ 54,371	\$ 57,495	\$ 59,063	\$ 60,229
<u>Total</u>				
Operating expenses	\$2,716,936	\$3,101,720	\$3,104,323	\$3,496,754
Capital equipment	196,000	226,600	226,600	271,350
Construction	433,450	444,900	444,900	775,000
Subtotal	\$3,346,386	\$3,773,220	\$3,775,823	\$4,543,104
<u>Staffing-Total FTE's</u>				
Research, Development, and Testing	154	105	105	57
Inertial Confinement Fusion	-	-	-	-
Production & Surveillance	611	665	665	665
Program Direction	890	919	919	912
Total	1655	1689	1689	1634

Authorization: Section 1, Public Law 83-703
Section 91, Atomic Energy Community Act of 1955

NOTE: Explanation of footnotes on following page.

Footnotes for Weapons Activities Lead Table

- a/ Reflects transfer of \$2,475,000 and 66 full-time equivalents from Weapons Activities Program Direction as a result of a reorganization at the Albuquerque Operations Office. Includes transfer of \$5,545,000 for Marshall Islands and Nevada Dose Assessment program from the Office of Environmental Protection, Safety, and Emergency Preparedness. Reflects transfer of \$3,000,000 to the Office of Energy Research for the Los Alamos Meson Physics Facility.
- b/ Reflects transfer of \$1,155,000/24 full-time equivalents to Weapons Activities Program Direction as a result of a reorganization at the Albuquerque Operations Office.
- c/ Includes \$18,300,000 FY 1983 Supplemental.
- d/ Reflects transfer of \$2,475,000 and 66 full-time equivalents to Weapons Activities Research, Development, and Testing. Reflects transfer of \$1,155,000/24 full-time equivalents from Weapons Production and Surveillance.
- e/ Includes pending FY 1984 Supplemental of \$17,200,000 for state sales/use taxes. Reflects transfer of \$3,000,000 to the Office of Energy Research for the Los Alamos Meson Physics Facility. Includes transfer of \$5,270,000 and \$4,000,000 FY 1984 Supplemental funding for Marshall Islands and Nevada Dose Assessment Program from the Office of Environmental Protection, Safety, and Emergency Preparedness. Reflects transfer of \$750,000/18 full-time equivalents to Weapons Activities Program Direction.
- f/ Includes pending FY 1984 Supplemental of \$11,900,000 for safeguards and security projects.
- g/ Includes pending FY 1984 Supplemental of \$20,400,000 for state sales/use taxes. Reflects transfer of \$1,190,000/24 full-time equivalents to Weapons Activities Program Direction.
- h/ Includes pending FY 1984 Supplemental of \$16,100,000 for environmental and safeguards projects. Reflects \$50,000,000 congressional rescission for Project 82-D-109, 155mm Artillery Fired Atomic Projectile (AFAP) Production Facilities, Various Locations.
- i/ Reflects transfer of \$375,000 and 9 full-time equivalents to the Office of Nuclear Energy. Reflects transfer of \$1,940,000/42 full-time equivalents from Weapons Research, Development, and Testing and Weapons Production.

Department of Energy
FY 1985 Congressional Budget Request

Summary of Changes
Weapons Activities
(In thousands of dollars)

Weapons Research, Development, and Testing

FY 1984 Appropriation	\$1,409,300
Built-in increases and decreases:	
Impact of January 1984 pay raise, pay ceiling increases, Federal Medicare and FICA contributions, and increased health benefits cost	+ 65
FY 1985 Base	<u>\$1,409,365</u>

Program Increases and Decreases:

Escalation for operating expenses, capital equipment, and general plant projects	\$ + 72,510
Continuation and completion of prior-year projects	+ 36,200
Land acquisition for the Lawrence Livermore National Laboratory buffer zone	+ 10,000
Increase research and development level of effort to approximately 8,250 full-time equivalents	+ 46,680
Increase testing effort	+ 31,575
Increase computer leases to support expanded computational effort	+ 7,265
Increase equipment	+ 12,980
Increase general plant project funding to slow deterioration	+ 8,000
Increase safeguards and security construction	+ 20,600
Provide funding for research, development, and testing revitalization of the most urgently needed facilities	<u>+ 68,000</u>
FY 1985 Budget Request	<u><u>\$1,723,175</u></u>

Inertial Confinement Fusion

FY 1984 Appropriation	\$ 169,700
Built-in increases and decreases:	
None	0
FY 1985 Base	<u>\$ 169,700</u>

Program Increases and Decreases:

Escalation for operating expenses and capital equipment	\$ + 5,950
Reduction in experimental effort	- 28,250
Complete funding for Particle Beam Fusion Accelerator (PBFA-II)	<u>- 9,400</u>
FY 1985 Budget Request	<u><u>\$ 138,000</u></u>

Weapons Production and Surveillance

FY 1984 Appropriation \$2,136,725

Built-in increases and decreases:

Impact of January 1984 pay raise, pay ceiling increases, Federal
Medicare and FICA contributions, and increased health benefits
costs 970

FY 1985 Base \$2,137,695

Program Increases and Decreases:

Escalation for operating expenses, capital equipment, and general
plant projects \$ + 91,605

Increased production workload +175,100

Continue efforts to expand computer-aided design and
manufacturing capabilities + 8,500Increased equipment funding to slow the deterioration of the
production equipment base + 13,600Provides 34 percent real growth in general plant project funding
to slow deterioration of utility systems in the production complex ... + 9,200

Initiate three production support construction projects

- Enriched uranium recovery improvements, Y-12 Plant + 4,500

- Power plant and steam distribution system, Pantex Plant + 4,500

- Renovate plutonium building utility systems, Rocky Flats + 5,800

Initiate safeguards and site security upgrades, various locations + 7,800

Initiate environmental improvements, Y-12 Plant + 5,000

Initiate tactical bomb production facilities, various locations + 10,000

Continue prior-year projects +148,400

FY 1985 Budget Request \$2,621,700Weapons Program Direction

FY 1984 Appropriation \$ 57,495

Built-in increases and decreases:

Impact of January 1984 pay raise, pay ceiling increases,
Federal Medicare and FICA contributions, and increased health
benefits + 1,568

FY 1985 Base \$ 59,063

Program Increases and Decreases:

Increase in contractual services \$ + 1,055

Increase in travel + 183

Decrease in Community Assistance Program - 72

FY 1985 Budget Request \$ 60,229

The weapons program budget provides for essential effort required to support the development, testing, production, and lifetime surveillance of safe and reliable nuclear weapons to meet national defense needs. A related effort involving research in inertial fusion is required for work relevant to weapons research, particularly with respect to laboratory-scale investigation of certain phenomena pertinent to weapons physics. Research, development, and testing activities in FY 1985 will be pursued in support of weaponization (development engineering - Phase 3) requirements related to the the W81 warhead for the Standard Missile-2, the W87 warhead for the PEACEKEEPER system, the TRIDENT II warhead, and the Advanced Air-to-Surface Missile system warhead. This budget is structured to continue to increase the level of effort for the technology base, particularly in areas related to strategic defensive technologies, while still being responsive to the near-term needs for weaponization. The research and development employment in the weapons laboratories is planned to increase by about 300 full-time equivalents.

The testing budget will support nuclear device tests in FY 1985 and allow for the preparation required to support the testing effort in future years. The level of testing effort will support tests related to the weaponization effort in the laboratories and tests for effort related to future requirements. Emphasis will be placed upon obtaining experimental information in the most cost-effective manner.

With regard to the inertial fusion effort, the funds requested in FY 1985 support efforts to build a base of physics understanding required for weapons design technology and target design requirements for ignition. The data obtained by experiments will support an evaluation in the FY 1987 time frame of inertial fusion for further contributions to weapon physics research and for possible development as an energy source.

The budget also provides for the production of new nuclear weapons for the stockpile and for the surveillance and maintenance of existing stockpile weapons as approved by the President. Included are the full-scale production of the B61-3 and -4 bombs, the W76 warhead for the TRIDENT, the W79 warhead for the Artillery Fired Atomic Projectile, the W80-0 warhead for the Sea Launched Cruise Missile, the W80-1 warhead for the Air Launched Cruise Missile, the B83 Strategic Bomb, the W84 warhead for the Ground Launched Cruise Missile, and the W85 warhead for the PERSHING II Missile and predelivery production effort for the W81 warhead for the Standard Missile-2, the W87 warhead for the PEACEKEEPER missile, and the TRIDENT II warhead.

The Production and Surveillance and Program Direction portions of this budget request reflect reductions totaling \$11,396,000 for savings resulting from management initiatives in the areas of administrative organization management, administrative systems and processes, payroll/personnel, procurement reform, printing and publications, and travel management.

Reference is made throughout the budget to the weapons program phases that outline the functions and procedures which are followed in the "birth-to-death" cycle of a nuclear weapon. These phases were defined in a joint Atomic Energy Commission-Department of Defense agreement dated March 21, 1953. This agreement is still in effect, and the only significant change to this portion of the original agreement has been the addition of Phase 7.

The seven phases are:

- Phase 1 - Weapons Conception
- Phase 2 - Program Study or Feasibility Study
- Phase 3 - Development Engineering or Full-Scale Development
- Phase 4 - Production Engineering
- Phase 5 - First Production
- Phase 6 - Quantity Production and Stockpile
- Phase 7 - Retirement

	FY 1984 Appropriation	FY 1985 Request
Research, Development, and Testing	\$1,409,300	\$1,723,175
<u>OPERATING EXPENSES</u>	\$1,213,100 <u>a/</u>	\$1,363,625
Research and Development	722,730	815,625
Testing	490,370	548,000

This program provides for the effort performed by the Lawrence Livermore National Laboratory, the Los Alamos National Laboratory, the Sandia National Laboratories, and other contractors in research, development, and testing of nuclear weapons including development, engineering, and certification of nuclear warheads required by the Department of Defense for stockpile, investigation of concepts and technologies for future weapons, and advancement of the sciences and technologies applicable to nuclear weapons. Also included in this budget request are the costs associated with the operation of the Nevada Test Site and related costs incurred for the detonation of test devices. This program also supports a Federal employment level of 57 full-time equivalents which is below the FY 1984 level of 98 full-time equivalents.

In accordance with a Grace Commission recommendation, the Department of Energy will conduct a study to determine if it is more cost effective to employ contract firefighters at the Los Alamos National Laboratory or maintain the 98 Federal firefighters currently at the Laboratory. The FY 1985 budget request assumes that the firefighters will be contract employees. The 57 Federal employees will be located at the following offices in FY 1985:

Los Alamos Area Office Support Staff	49
San Francisco Operations Office Couriers	8
Total	<u>57</u>

The following table presents the weapons research, development, and testing operating funding by organization.

Lawrence Livermore National Laboratory	\$ 262,400	\$ 294,900
Los Alamos National Laboratory	239,300	273,500
Sandia National Laboratories	365,700	404,900
Nevada Operations Office	329,100	360,700
Other	<u>16,600</u>	<u>29,625</u>
Total Weapons research, development, and testing .	\$1,213,100	\$1,363,625

The basic product of the research, development, and testing program is the generation of new ideas in weapon concepts and technologies and the application of these developments to continuing, new, or evolving Department of Defense requirements in a timely, efficient, and economical manner. These new ideas can ultimately lead to weapons which are safer, more effective, and better adapted to the needs of the Department of Defense. The request for research, development, and testing for FY 1985 supports efforts to maintain and improve the weapons technology base; weapons development, engineering, and certification activities; testing capabilities; and special projects. Laboratory research and development employment and the level of underground nuclear device tests represent approximate indicators of the levels of effort being devoted to these activities. However, the level of employment and the number of device tests in a given fiscal year may vary as a function of several factors including the number and nature of development engineering programs in progress, the types of technologies being developed for future systems, the success of prior-year underground device tests, complexity of tests, and the mix of resources (labor, procurements, and other costs) required to accomplish these activities. It is expected that the requested funding will support a growth of about 300 full-time equivalents in research and development and increase the testing effort.

a/ Includes pending FY 1984 Supplemental appropriation request of \$17,200,000 for state sales/use taxes.

The following table summarizes and compares the FY 1984 level of effort and the program that can be accommodated within the FY 1985 request.

	FY 1984		FY 1985	
	R&D	Employment	R&D	Employment
	Direct	Total	Direct	Total
Weapons technology base	1,935	3,770	2,100	4,120
Weapons development, engineering, and certification	1,680	3,650	1,660	3,600
Testing capabilities	30	50	30	50
Special projects	260	480	260	480
Total	3,905	7,950	4,050	8,250

The FY 1985 request supports the continuation of the Department of Energy's plan to reinvest in the nuclear weapons science and technology base. During the decade of the 1970's, the majority of the limited research, development, and testing resources were devoted to meeting the near-term requirements for development, engineering, and certification of new warheads for the Department of Defense. As a result, the resources available for the weapons technology base efforts were greatly reduced. Reduction in the technology base area ultimately leads to an erosion of the foundation upon which future weapon systems are built. To correct this situation, a phased buildup of the weapons technology base activities was begun in FY 1981.

Evidence of the value of reinvesting in the nuclear weapons science and technology base can be seen in certain emerging new concepts, particularly those with potential application to strategic defense. During FY 1983, these concepts were more fully defined and received additional experimental support. This progress and the President's call for vigorous research into areas that could lead to effective strategic defense have encouraged the Department of Energy to pursue these concepts with the basic goal of establishing technical feasibility. Once this is established, and the Department of Defense has sufficiently investigated the military utility of such weapons, an informed decision will be possible on proceeding with subsequent weaponization activities. In FY 1984, efforts will continue on these concepts and technologies consistent with overall program priorities.

Most of the requested FY 1985 increase in the research, development, and testing program will be used for growth in the defensive technologies area. This will support a broadly based, aggressive, technology limited effort to explore the feasibility of these concepts and other supporting technologies directed toward establishing technical feasibility of most ideas by the early-to-mid 1990's. Weaponization on any of these concepts would not be expected until sometime later, depending on the complexity of the systems proposed. It should be noted that to provide the proper emphasis on these concepts and maintain appropriate support for more traditional research, development, and testing activities may require additional growth in employment and test levels in future years. In addition, this high-gain, high-risk effort in the defensive technologies area will contribute to the basic nuclear weapons efforts.

Technology base research, development, and testing activities provide the fundamental scientific, engineering, and facility capabilities upon which this Nation's nuclear weapons development, engineering, and certification efforts are based. The primary emphasis in this area is on providing an inventory of proven ideas and concepts for timely and effective application to evolving Department of Defense system requirements; the conduct of basic studies in unique areas of physics, mathematics, chemistry, and the engineering sciences that will provide tomorrow's breakthroughs in nuclear weapons technology; and the maintenance of a central core of facilities and capabilities unique to nuclear weapon design. In FY 1985, approximately \$661,225,000 will be devoted to technology base activities compared to \$572,900,000 in FY 1984.

Efforts within the technology base category include:

1. Advanced concepts - Develops design concepts and components with potential for future Department of Defense systems applications. Emphasis will continue in areas where exploratory experimentation is expected to provide significant payoffs during the intermediate term. However, increased effort will be expended on investigations of concepts having longer term payoffs as well.
2. Supporting research - Includes those program areas of physical and engineering science and technology that are fundamental to nuclear weapon development and the generation and propagation of energy in all forms as a weapon application but where an existing lack of understanding limits the ability of the designer to develop an analytical or engineering model. Included under supporting research are most of the disciplines associated with the physical, chemical, mathematical, and engineering sciences.
3. Supporting technologies - Includes those activities related to improved utilization of laboratory experimental facilities and capabilities; increased understanding of advanced materials and their potential applications; development of processes to formulate and fabricate new materials; and the development and application of computer codes and to analyze and predict the response of engineering materials and structures to various environments including nuclear and directed energy effects.

During FY 1985, underground nuclear device tests will be conducted at the Nevada Test Site to support the laboratory efforts mentioned above. These full-scale field tests represent an integral element in confirming the feasibility and practicality of the ideas and concepts developed in the technology base category.

Weapons development, engineering, and certification activities are guided by current national requirements for providing new strategic nuclear weapon options, for modernizing tactical nuclear weapons, and for monitoring and maintaining the reliability of all nuclear weapons now in stockpile. All Phase 3 requests for weaponization or development engineering programs are transmitted formally by the Department of Defense to the Department of Energy through the Military Liaison Committee. Approximately \$405,900,000 will be allocated to weapons development, engineering, and certification efforts in FY 1985 compared to \$361,100,000 in FY 1984.

Weapons development, engineering, and certification activities for FY 1985 will include the following programs:

W81 Standard Missile-2 Warhead

The W81 provides a nuclear warhead for the Navy's Standard Missile-2 for defense against nuclear-armed air, surface, and submarine launched cruise missile threats. The TERRIER and AEGIS systems will accommodate the nuclear Standard Missile-2.

W87 PEACEKEEPER Warhead

The W87 warhead incorporates an insensitive high explosive, improved fire resistance, and other enhanced safety features for application in the PEACEKEEPER system.

TRIDENT II Warhead

The TRIDENT II warhead will be designed for the Sea Launched Ballistic Missile force. The warhead/reentry body combination is a new design to provide enhanced hard target kill capability.

Advanced Air-to-Surface Missile System (AASM)

AASM is to be the Short Range Attack Missile (SRAM) replacement.

The following candidate systems will continue in or could enter Phase 1 conceptual study status, Phase 2 feasibility study status, or Phase 2A design definition and cost study status during FY 1985:

- Antisubmarine Warfare/Stand-Off Weapon (ASW/SOW)
- Antisubmarine Warfare/Vertical-Launch ASROC (ASW/VLA)
- Antisubmarine Warfare/Nuclear Depth Bomb (ASW/NDB)
- Small Intercontinental Ballistic Missile (ICBM)
- Ballistic Missile Defense (BMD)

The budget request also supports a stockpile improvement effort. This work is intended to extend the stockpile life of existing weapons by incorporating technical improvements such as insensitive high explosives, enhanced electrical safety, permissive access, and command disablement features. These improvements are a cost-effective alternative to replacement of existing weapons.

Underground nuclear device tests are expected to be conducted during FY 1985 in support of weapons development, engineering, and certification.

Testing capabilities category encompasses those activities necessary to maintain and enhance capabilities for conducting nonnuclear laboratory scale and field experiments and for conducting full-scale underground nuclear device tests at the Nevada Test Site. Included in this category are efforts directed toward (1) improving the technology in all areas of testing that are relevant to the nuclear weapons program, (2) the conduct of environmental and safety programs at the Nevada Test Site to assure that all nuclear device tests are executed in a safe and environmentally acceptable manner, (3) overall maintenance and operation of the Nevada Test Site, (4) provision of logistical support to the laboratories and other technical organizations that participate in test activities at the Nevada Test Site, and (5) preparatory activities for future testing at the Nevada Test Site. In FY 1985, program and funding requirements permitting, increased emphasis will continue on maintenance of the Nevada Test Site at more appropriate levels. Emphasis will be placed upon improvements in such areas as containment technology; drilling, emplacement, and stemming techniques; prompt diagnostics incorporating digitized data and fiber optics; and radiochemistry diagnostic techniques and analysis. In FY 1985, approximately \$238,900,000 will be devoted to testing capabilities compared to \$222,100,000 in FY 1984.

Special projects category includes activities that utilize many of the scientific and technical capabilities employed in the design and development of nuclear weapons to support related needs. Major areas of emphasis include research and development efforts related to improved hardware, systems, and procedures for the protection of nuclear weapons and strategic quantities of special nuclear material during shipment and storage; the operational costs associated with maintenance of the Department of Energy's Nuclear Emergency Search Team capabilities located at Las Vegas, Nevada, and Andrews Air Force Base, Maryland, and research efforts directed toward the development of improved search and detection systems and techniques for incorporation into the Nuclear Emergency Search Team; and other special studies and audits. This category also contains the funding for Federal employment and related services in support of the research, development, and testing effort. In FY 1985, approximately \$51,600,000 is planned for special projects compared to \$47,400,000 in FY 1984.

Marshall Islands and Environmental Programs category includes all costs incurred in carrying out the Department's health and environmental obligations and responsibilities with respect to residual studies relating to the United States nuclear weapons atmospheric testing program, primarily in the Marshall Islands and near the Nevada Test Site. Specific activities include: provision of medical care to persons who were directly and/or indirectly exposed to radiation from the nuclear weapons atmospheric testing program; radiological monitoring of the environment and the populations living on atolls which remain contaminated with radioactivity; radiation dose assessments for populations living on or returning to atolls contaminated with radioactivity; reassessment of radiation exposure levels to the offsite population in areas surrounding the Nevada Test Site; gathering available dosimetry source documents and information regarding nuclear device development and testing into a computerized master file; and logistical support for all the above activities, including patient and physician transport, ship charter, fuel, and other associated support costs. In FY 1985, approximately \$6,000,000 is planned for this work as compared to \$9,600,000 in FY 1984. The FY 1984 estimate includes \$4,000,000 of supplemental funding provided under Public Law 96-205 for implementation of a comprehensive four atoll health care plan. This Supplemental funding will be used to develop health care arrangements described in Public Law 96-205 and consistent with Section 177 of the Compact for Free Association. The provision of these funds does not assume any future commitment for additional funding for this effort. Responsibility for development of this plan rests with the Department of Interior. Previously, all funding for the Marshall Islands category was provided through the Energy Supply Research and Development Appropriation. Beginning in FY 1985, funding for the baseline program will be requested as part of the Department's Atomic Energy Defense Activities Appropriation.

Computer Leases

A key element in the efficient and cost-effective accomplishment of program goals in weapons research, development, and testing is the network of computers located at the Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and Sandia National Laboratories. Large scientific computers are essential for the design of modern nuclear weapons, and, with the recent growth in the weapons program science and technology base, the laboratories' computer capacity has been saturated. This growth in computing demand is due in large part to the continued emergence of new weapon concepts with potential defensive applications. This demand will continue to grow as efforts to establish the technical feasibility of these concepts are continued over the next several years. This work is highly computer-intensive, both by its nature and for cost effectiveness; the only alternative to computer simulation to develop and determine the military usefulness of these concepts would be a large number of expensive nuclear tests.

In light of these increasing requirements for computational capacity and the cost of major systems, a vigorous planning process has been implemented to evaluate program needs and balance these with laboratory capabilities and funding availability. The resulting strategy for computer acquisitions seeks to build and maintain a strong computer capability through an orderly program of leasing and purchasing the best equipment available to meet program needs.

Included in the request of \$31,188,000 is support for ongoing leases for scientific systems and some smaller administrative computers, as well as storage and input/output equipment. The growth in lease costs can be attributed principally to the installation of enhanced Class VI and Class VII computer systems for Los Alamos and Lawrence Livermore National Laboratories. The availability of a Class VII computer, which involves new multiprocessor technology, in the FY 1985 time frame is still uncertain. The laboratories' weapons design models utilize computer codes requiring both more capacity and capability, and the enhanced Class VI provides about twice the capacity of current Class VI machines with some capability increase. The Class VII is expected to provide a ten-fold increase in capacity and capability. This is essential to efficiently run the design codes with the physics, mathematics, number of mesh points, and time steps which are intractable on even the enhanced Class VI. However, in the event that Class VII technology is not available in FY 1985, upgraded Class VI capability will be acquired to alleviate system saturation in the interim.

The following is a detailed list of the planned computer leases for FY 1985:

	FY 1984 Appropriation	FY 1985 Request
<u>Lawrence Livermore National Laboratory (LLNL)</u>		
Cray-1 (3), S/N 38	\$ 1,032	\$ 1,225
Cray-1 (4), S/N 43	635	0
Cray XMP	3,297	3,858
Class VII	0	1,560
Management Information Data Base Computer	351	420
Input/Output System, CHORS II	80	0
Storage System, Archival Memory, Phase I	125	0
Total	\$ 5,520	\$ 7,063
<u>Los Alamos National Laboratory (LANL)</u>		
Cray-1 (3rd)	\$ 3,400	\$ 3,400
Cray XMP	3,400	4,020
Administrative Computers	370	95
Cray XMP	2,210	5,500
Class VII	0	2,300
Total	\$ 9,380	\$15,315
<u>Sandia National Laboratories (SNL)</u>		
Cray-1, SNLL	\$ 200	\$ 0
Cray-1, SNLA	1,910	0
Data Reduction Replacement, SNLA	1,250	1,170
Laser Printer, SNLA	160	260
Dual Front End, SNLA	200	260
Timesharing Replacement, SNLA	1,280	300
Integrated File Storage (IFS) Expansion, SNLA ...	200	200
Administrative Data Processing Centers, SNLA	370	450
Class VI/VII, SNLA	0	3,200
Very Large Scale Integrated (VLSI) Design Computer, SNLA	0	600
Mass Storage Completion, SNLL	370	370
Timesharing System, SNLL	1,500	1,600
Cray Memory Addition, SNLL	0	400
Total	\$ 7,440	\$ 8,810
<u>Nevada Operations Office</u>		
Distributed Network	\$ 100	\$ 0
Total, Computer Leases	\$22,440	\$31,188

Identified below are new items scheduled for lease in FY 1985:

Class VII Computer - Lawrence Livermore National Laboratory and Los Alamos National Laboratory

The acquisition of a Class VII computer is planned for both Lawrence Livermore National Laboratory and Los Alamos National Laboratory in FY 1985. Since they are a new technology, both are planned to be acquired under lease with option to purchase.

Class VII computers are expected to be available commercially in early FY 1985. These computers will utilize multiple central processing units (4 to 8, depending upon vendor and specific machine configuration) and provide much greater memory. These combined aspects will improve capacity and capability by a factor of 10 over current Class VI technology (Cray-1 and Cyber 205).

The additional capability is required in the design laboratories to accommodate complex physical modeling programs in two and three dimensions. The free Lagrangian and automatic rezone techniques in hydrodynamics and new techniques in matrix inversion for transport physics are two areas which require the capability of Class VII computers. The benefits

that will accrue include significant improvements in the accuracy of models and simulations which will assist designers in completing designs on schedule and reduce the need for costly explosive tests.

Class VI/VII- Sandia National Laboratories, Albuquerque

Recent studies by the Sandia technical community clearly indicate the need for computers that can handle two- and three-dimensional calculations using finer meshes to bring new generation weapons design problems within the practical realm of workability. Depending upon availability, enhanced Class VI or Class VII technology is planned for acquisition.

Very Large Scale Integrated Design Computer - Sandia National Laboratories, Albuquerque

This item will be dedicated to support of microelectronics design, fabrication, and testing. The proposed acquisition will augment and extend the present capability rather than replace it. The software used for Very Large Scale Integrated design has been developed over a period of 6 to 8 years and rewriting it to execute on a different computing configuration would require a major effort (10 to 20 manyears, depending on configuration). The proposed system will provide upward compatibility for the current software and will allow high-speed local networking of the new and old equipment, thus providing an expanded automatic data processing capability with a minimum of schedule disruption.

Mass Storage Completion - Sandia National Laboratories, Livermore

In FY 1983, a major upgrade to network capabilities was made to allow more effective utilization of major scientific computers and to maximize the output from scientific computer users. In FY 1984, the initial phase of our network upgrade will be completed, and the acquisition (spaced over 3 years) of the mass storage system will be finished. The mass storage system will be completed on a 3-year lease-to-ownership basis and the network upgrade will be effected through purchases.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>CAPITAL EQUIPMENT</u>	\$ 108,400	\$ 127,450
Research and Development	68,800	83,660
Testing	39,600	43,790

The weapons program capital equipment funding for research, development, and testing supports specific program needs at the Nevada Test Site and the national laboratories-- Lawrence Livermore National Laboratory, Los Alamos National Laboratory, and Sandia National Laboratories. In addition, some portion of these funds is used to support the administrative and site operations at these locations, including safeguards and security equipment, health and safety equipment, office equipment, and maintenance and warehousing equipment.

The following table presents the planned capital equipment funding by organization:

	FY 1984 Appropriation	FY 1985 Request
<u>Lawrence Livermore National Laboratory</u>		
Basic	\$ 15,050	\$ 17,650
Computers	7,850	11,650
Total	<u>22,900</u>	<u>29,300</u>
<u>Los Alamos National Laboratory</u>		
Basic	14,825	17,650
Computers	4,875	6,210
Total	<u>19,700</u>	<u>23,860</u>
<u>Sandia National Laboratories</u>		
Basic	20,425	25,050
Computers	9,175	11,700
Total	<u>29,600</u>	<u>36,750</u>
<u>Nevada Operations Office</u>		
Basic	33,700	37,540
Computers	2,500	0
Total	<u>36,200</u>	<u>37,540</u>
<u>Total</u>		
Basic	84,000	97,890
Computers	24,400	29,560
Total	<u>\$ 108,400</u>	<u>\$ 127,450</u>

An adequate equipment base in the weapons research, development, and testing complex is crucial to maintaining the United States position in the forefront of nuclear weapons technology. As has been stated in past budgets, physical and technological deterioration has been and continues to remain a major concern for the complex. Although the FY 1985 request level represents an increase over FY 1984, some continued deterioration in the capital asset base will occur in FY 1985. State-of-the-art improvements in many areas of equipment, particularly diagnostics, will be needed to support the investigation of strategic defensive technologies. The FY 1985 request will support emphasis in these areas.

	FY 1984 Appropriation	FY 1985 Request
<u>Basic Equipment</u>	\$ 84,000	\$ 97,890
Research and Development	46,900	54,100
Testing	37,100	43,790
<u>Lawrence Livermore National Laboratory</u>	\$ 15,050	\$ 17,650

Capital equipment requirements at the Lawrence Livermore National Laboratory included in this request constitute items devoted to weapons program needs as well as a portion of the general support equipment items necessary for operation of the laboratory.

Representative items in the FY 1985 budget include a Tee-base lathe, laser welder, scanning electron microscope, x-ray lithograph, optical disk systems, rotating mirror framing camera, and color scanner.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>Los Alamos National Laboratory</u>	\$ 14,825	\$ 17,650

Capital equipment requirements at the Los Alamos National Laboratory included in this request constitute items devoted to weapons program needs as well as a portion of the general support items necessary for operation of the laboratory.

Representative items in the FY 1985 budget for the Los Alamos National Laboratory include a rotating anode x-ray source, instron testing machine, thermal ionization mass spectrometer, fast streak/frame camera, and oscilloscopes with cameras.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>Sandia National Laboratories</u>	\$ 20,425	\$ 25,050

Capital equipment requirements at the Sandia National Laboratories located in Albuquerque, New Mexico, and Livermore, California, constitute items for weapons program needs and a portion of the general support equipment items necessary for operation of the laboratories.

Other representative items in the FY 1985 budget include printed circuit board plasma etcher, scanning electron microscopes, high speed wave form digitizers and tunable dye laser, micro-focus x-ray machine, and inertia welder.

One major item of basic equipment, the Second Generation Laser Tracker Range Controller, is requested at \$1,550,000. The Laser Tracker is an optical tracking device which provides ballistic trajectory data and photometric coverage of high velocity targets. Its primary uses at Sandia National Laboratories are in conjunction with rocket sled tests (both captive and ejection experiments) and with Coyote Canyon flight tests. The original Laser Tracker was acquired in 1967, and in 1976 it underwent major redesign. There are, however, technical deficiencies resulting from some limitations in the original design.

A Laser Tracker II system was developed during the FY 1982/1984 time frame to supplement the original system because of conflicting tests and the need for dual monitoring of some tests. The Laser Tracker II incorporates numerous operational improvements over the original system.

By FY 1985, the original tracker, as modified, will be in need of rebuilding for both technological and operational considerations. The gimbal system and the mechanical support equipment will be 20 years old and the redesigned electronics and optics will be 10 years old as well as being technologically deficient. A second generation Laser Tracker Range Controller will be required to replace the original tracker system. This tracker will incorporate all of the characteristics of the Laser Tracker II. These include: (1) improved photometrics, (2) slaved operational capability, (3) angle of attack measurement, (4) impact angle measurement, and (5) in-flight tracking capture.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>Nevada Operations Office</u>	\$ 33,700	\$ 37,540

The FY 1985 equipment request for the Nevada Operations Office supports equipment requirements related to the Nuclear Emergency Search Team's capabilities and the execution of the underground test program at the Nevada Test Site.

Representative equipment items include Nuclear Emergency Search Team operational support equipment; Nevada Test Site construction equipment; and communications, laboratory, security, and shop equipment.

	FY 1984 Appropriation	FY 1985 Request
Major computer equipment	\$ 24,400	\$ 29,560
Research and Development	21,900	29,560
Testing	2,500	0

The FY 1985 request for computer purchases provides for a planned buyout of a Cray-1 machine at the Lawrence Livermore National Laboratory, as well as administrative computers at Los Alamos and Sandia National Laboratories. It also includes an increase in funds for computer-aided design requirements over the amount appropriated in FY 1984.

Scientific computers are an essential resource for advancing the weapons program science and technology base and for the design of modern nuclear weapons. Increased computational capacity and capability is required to meet current demands for modeling complex weapons physics, as well as for developing more accurate numerical and theoretical methods. Because of the recent growth in these areas and the emergence of new weapons concepts, the computational capacity at the three major weapons laboratories is saturated. This, coupled with the new emphasis in defensive systems applications, has made it extremely critical to plan for continuous, gradual introduction of new hardware to build and maintain the computer network.

Of equal importance are the enhanced graphics and analytical capabilities afforded by the continuing investment in computer-aided design hardware at the design laboratories. Over the past several years, the laboratories have demonstrated the benefits of computer-aided design technology in terms of decreased design turnaround times, increased personnel productivity which has helped avoid some manpower increases, and increased engineering capabilities.

Further benefits lie in the integration of the computer-aided design system within the nuclear weapons complex once the laboratories are in a position to conduct a full system design in a computer-aided design system environment. This integration will be accomplished with the use of communication links and common data bases and will shorten lead times, improve product, and reduce costs. In this regard, Sandia National Laboratories, Albuquerque, was tasked with developing the means to automate the exchange of product definition between the design laboratories and the nuclear weapons production complex in August 1982. To date, some 17 pilot projects have been or will be set up to test and demonstrate approaches to exchanging product definition between the laboratories and the production complex. Based on the results of Sandia National Laboratories' effort to date, it is probable that automated product definition exchange between the laboratories and the production complex can be implemented in the 1985/1986 time frame. The FY 1985 request of \$16,000,000 for computer-aided design hardware is a step in the process to bring the laboratories to a point where a full system design can be carried out in a computer-aided design environment and subsequently enable the automation of the exchange of product definition on a full-scale basis.

The following is a table of the computer purchases requested for FY 1985:

	FY 1984 Appropriation	FY 1985 Request
<u>Research and Development</u>		
<u>Lawrence Livermore National Laboratory</u>		
Cray-1 (3), S/N 38	\$ 0	\$ 7,650 a/
Cray-1 (4), S/N 43	3,000	0
Input/Output System, CHORS II	600 a/	0
Storage-Archival Memory, Phase I	2,500 a/	0
Administrative Mass Storage	450	0
Computer-Aided Design (CAD)	1,300	4,000
Total	\$ 7,850	\$11,650
<u>Los Alamos National Laboratory</u>		
Input/Output Station	\$ 800	\$ 0
Mass Storage Upgrade (2)	1,600	0
Output Station Upgrade	0	1,500
Administrative Computers	0	710 a/
Computer-Aided Design (CAD)	2,475	4,000
Total	\$ 4,875	\$ 6,210
<u>Sandia National Laboratories</u>		
Cray 81-1, SNLA	\$ 4,600 a/	\$ 0
Data Reduction Replacement, SNLA	0	300
Timesharing Replacement, SNLA	0	1,400
Administrative Data Processing Centers, SNLA	0	1,000 a/
Computer-Aided Design (CAD), SNL	2,775	8,000
Network Upgrade and Mass Storage Completion, SNLL	1,800	0
Cray Memory Addition, SNLL	0	1,000
Total	\$ 9,175	\$11,700
<u>Testing</u>		
<u>Nevada Operations Office</u>		
Distributed Network	\$ 2,500	\$ 0
Total, Computer Purchases	\$24,400	\$29,560

a/ Capital funds required for conversion of prior fiscal year leases.

FY 1984
Appropriation

FY 1985
Request

Lawrence Livermore National Laboratory

Cray-1 (3), S/N 38 \$ 0 \$ 7,650

This item is one of four Cray-1 computer systems which comprise the main computational capability at the laboratory. The system has 2 million words of main memory, 4 DCU 3 disk controllers, 16 DD-29 disk drives, and 3 network connections to the Lawrence Livermore National Laboratory OCTOPUS network. This system was installed in December 1981 and is planned for purchase in mid-FY 1985.

Computer-Aided Design \$ 1,300 \$ 4,000

This is the second of a series of multiyear items to expand computer-aided design capabilities at Lawrence Livermore National Laboratory. Implementation of this technology has already proven to be a cost-effective way to increase productivity and capability for the Mechanical and Electrical Engineering Departments at Lawrence Livermore National Laboratory to provide expanded capability in support of the nuclear weapons program. The following three areas of the weapons engineering design process have been targeted for further application of computer-aided design technology:

- o Design/drafting
- o Engineering modeling and analysis
- o Engineering design documentation

This FY 1985 item will provide for work stations, storage facilities, and data communications to the OCTOPUS network.

Los Alamos National Laboratory

Output Station Upgrade \$ 0 \$ 1,500

The printed and graphical output from all the computers in the Los Alamos Central Computing Facility and from various Distributed Processors in the laboratory's Integrated Computing Network, is processed on the PAGES Output Station. PAGES now averages about 12 billion bits of output per day with peaks of over 16 billion bits. On weekdays it generates as many as 60 thousand pages of printed output, 200 thousand frames on microfiche, 8 thousand frames of 16mm microfilm, 35 hundred frames of 35mm microfilm, and 500 pages of plots. PAGES' capacity and capability must keep pace with the growth in the laboratory's total computing power and with the increasing sophistication of techniques in using computer output resources to convey more information in more comprehensive forms. This acquisition will provide additional and improved output-generation hardware and the controllers to handle the volume of work and drive the new equipment.

Administrative Computers \$ 0 \$ 710

A set of three computers has been under lease to serve administrative data processing and management information system needs of the laboratory, and includes such areas as data base management, project management, transaction processing, and text processing. The machines--one a work machine in the Central Computing Facility and the others Distributed Processors--furnish computational power for the Administrative Partition of the Integrated Computing Network, the subdivision that is primarily used for sensitive unclassified data processing activities. That power continues to be needed, so this item is proposed as a buy-out of the leased equipment.

Computer-Aided Design \$ 2,475 \$ 4,000

This is the second year of a 3-year plan to acquire centralized computer-aided design processors, minicomputers, peripherals, software, network additions, and encryption devices for direct digital design-data interchange with other members of the weapons complex.

These proposed FY 1985 acquisitions respond to requirements for improved methods and support for conceptual and engineering design and manufacture of nuclear weapons components. The need for improved methods and support is generated by three principle design requirements: (1) more complicated components, (2) improved productivity, and (3) improved interdisciplinary coordination.

	FY 1984 Appropriation	FY 1985 Request
<u>Sandia National Laboratories</u>		
<u>Data Reduction Replacement,</u>		
<u>Sandia National Laboratories, Albuquerque</u>	\$ 0	\$ 300

This is the purchase of the Data Reduction System following 2 years of lease. The replacement of the old Data Reduction System is a super-mininetwork of three Data General MV8000 processors and associated peripherals. This system is installed in the Data Reduction Facility to perform the functions of acquisition, analysis, and presentation of data from all major Sandia weapons development and test programs. Typically, these processors are characterized by the need for real-time data processing, large calculational power, and a highly interactive system.

<u>Timesharing Replacement,</u>		
<u>Sandia National Laboratories, Albuquerque</u>	\$ 0	\$ 1,400

This is the purchase of the Time-Sharing Replacement System following 2 years of lease. Acquisition of this system was essential to relieve the time-sharing saturation on the 6600. The saturation resulted in unacceptable response time and memory allocation. Both factors were inadequate to meet users needs especially in the area of interactive graphics. An added dimension of color graphics that is valuable in portraying engineering problems could not be supported on the 6600 due to bandwidth limitations.

<u>Administrative Data Processing Centers,</u>		
<u>Sandia National Laboratories, Albuquerque</u>	\$ 0	\$ 1,000

This is the purchase of the Administrative Data Processing Centers that have been leased for periods of 1 to 2 years. Sandia completed conversion of its management information applications to online data input and retrieval in FY 1983. This resulted in total dependence on the 100/82 for the conduct of business. Two alternatives to this vulnerability were a large, physically removed, backup facility that could be integrated with the UNIVAC equipment or a network of minicomputers. The second and preferred alternative provided daily operational support with nightly update of 100/82 corporate files. The additional capacity provided postponed the need for expansion of the central facility. The center allows the 100/82 to support all laboratory programs. They also respond to the growing need for rapid access to current information. This also allows response to reporting and special information requests that occur as a part of the conduct of normal business.

<u>Computer-Aided Design, Sandia National Laboratories,</u>		
<u>Albuquerque/Sandia National Laboratories, Livermore</u> .	\$ 2,775	\$ 8,000

Additional computer-aided design/computer-aided manufacturing equipment is needed at Sandia National Laboratories, Albuquerque, and Sandia National Laboratories, Livermore, to improve weapon designs and to shorten weapon design time scales. Integration and expansion of computer-aided design, drafting, engineering, and manufacturing are the next steps in the use of computer-aided design technology at the Sandia National Laboratories. Sandia began using interactive computer-aided design in 1975. While present systems have demonstrated many benefits, further integration and increased capacity are necessary to realize the benefits in this rapidly changing technology. Designs must be originated on computer-based systems and the data must be available to those in the design, test, fabrication, inspection, and acceptance phases of the weapons programs. This equipment will increase Sandia's capacity for computer-aided design and add those peripherals and communication links necessary to make this a part of Sandia's overall network. This network will link designers, engineers, analysts, parts programmers, and others who need direct access to the design data base.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>Cray Memory Addition,</u>		
<u>Sandia National Laboratories, Livermore</u>	\$ 0	\$ 1,000

The memory capacity of the Cray-1 computer is inadequate to meet Sandia National Laboratories, Livermore programmatic needs. At present there are two options which will provide the capability to solve problems needing more memory. The first solution is an increase in core memory, and the second is the Solid-State Storage Device. The choice between them will depend upon the workload at the time and on the results of benchmarking the solid-state storage device. If new peripherals become available which can better satisfy the requirements, these will also be evaluated. Failure to upgrade the scientific computing facility at Sandia National Laboratories, Livermore, in this manner will seriously restrict the laboratories' scientists and engineers in the development of nuclear weapons and weapons technology and in energy-related research and development.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>CONSTRUCTION</u>	\$ 87,800 a/	\$ 232,100
Research and Development	52,800	185,900
Testing	35,000	46,200

The FY 1985 research, development, and testing construction program is a balanced approach for dealing with a number of pressing needs. The request consists of (1) \$31,600,000 for general plant projects; (2) \$91,500,000 for the revitalization of the research, development, and testing capital asset base; (3) \$50,800,000 to accomplish critical safeguards and security upgrades and improvements; and (4) \$58,200,000 to continue and complete prior-year projects.

The general plant projects request, \$31,600,000, is aimed at slowing the deterioration of the utility systems in the research, development, and testing complex. General plant projects is an integral part, along with the annual basic capital equipment funding and the restoration program, of the overall effort to restore and maintain the equipment and utility base at pre-FY 1980 levels.

During the 1970's, available weapons program resources were utilized to meet pressing production requirements. This situation resulted in a stagnation and in some cases an erosion in the capabilities of the research, development, and testing capital asset base. The FY 1985 revitalization request, \$91,500,000, is one part of a multiphased investment to revitalize the capabilities of the research, development, and testing complex. This investment will also enhance the Department of Energy's ability to place increasing program emphasis on defensive technologies.

Recent studies and appraisals of the research, development, and testing complex have indicated the need to upgrade and improve safeguards and security. The FY 1985 request, \$50,800,000, reflects our efforts to intensify the implementation of corrective actions.

The following table summarizes the construction line items included in the FY 1985 request. Specific project information can be found in the individual construction project data sheets.

a/ Includes pending FY 1984 Supplemental appropriation request of \$11,900,000 for safeguards and security projects.

Research and Development

<u>Project Numbers</u>	<u>Title</u>	<u>TEC</u>	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>New Projects</u>				
85-D-101	General plant projects, VL	\$ 24,100	\$ 0	\$ 24,100
85-D-102	Nuclear weapons research, development, and testing facilities revitalization, Phase I, VL	143,900	0	56,600
85-D-103	Safeguards and security enhancements, Livermore, CA	40,100	0	4,700
85-D-106	Hardened radiography facility, Site 300, LLNL	4,800	0	800
	Total new projects		0	86,200
<u>Prior-Year Projects</u>				
84-D-101	General plant projects, VL	16,000	16,000	0
84-D-102	Radiation-hardened integrated circuit laboratory, SNLA	40,500	2,000	20,000
84-D-103	Hardened central guard force facility, LANL	6,200	600	5,600
84-D-104	Nuclear materials storage facility, LANL	19,300	700	6,500
84-D-105	Safeguards and security upgrades, Phase I, LANL	15,100	5,000 a/	10,100
84-D-106	Security system upgrade, SNLA	3,800	1,500 a/	2,300
83-D-199	Buffer land acquisition, Livermore, CA .	34,000	7,000	17,000
82-D-144	Simulation technology laboratory, SNLA .	39,000	8,000	16,500
82-D-150	Weapons materials research and development facility, LLNL	27,200	2,900	16,800
82-D-152	New detonator facility, LANL	17,100	5,600	0
81-D-134	Earthquake damage restoration, SNLL	8,600	0	4,900
78-16-g	Radioactive liquid waste improvement, LANL	12,500	3,500	0
	Total prior-year projects		52,800	99,700
	Total Research and Development		\$ 52,800	\$185,900

Testing

<u>New Projects</u>				
85-D-101	General plant projects, VL	\$ 7,500	\$ 0	\$ 7,500
85-D-104	Test devices assembly building, LANL ...	10,500	0	800
85-D-105	Combined device assembly facility, NTS .	57,500	0	3,000
	Total new projects		0	11,300
<u>Prior-Year Projects</u>				
84-D-101	General plant projects, VL	6,100	6,100	0
84-D-107	Nuclear testing facilities revitalization, VL	75,200	23,500	34,900
84-D-108	Safeguards and site security upgrade, NTS	5,400	5,400 a/	0
	Total prior-year projects		35,000	34,900
	Total Testing		\$ 35,000	\$ 46,200

a/ Reflects pending FY 1984 Supplemental appropriation request.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing

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

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

3. Date A-E work initiated: 1st Qtr. FY 1985

5. Previous cost estimate: None
Date:

3a. Date physical construction starts: 1st Qtr. FY 1985

6. Current cost estimate: \$31,600
Date: 1/84

4. Date construction ends: 4th Qtr. FY 1987

7. Financial schedule

Costs

<u>Fiscal Year</u>	<u>Obligations</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>After FY 1985</u>
Prior to FY 1983	\$ 0	\$ 9,797	\$ 4,000	\$ 1,550	\$ 0
1983	15,800	4,700	6,300	4,800	0
1984	22,100	0	6,600	8,800	6,700
1985	31,600	0	0	11,000	20,600

8. Brief physical description of project

This project provides for general plant improvements involving minor new construction. The work to be performed will include such activities as construction of roads, utilities, minor structures, capital alterations and additions, and technical facilities required for the operation of weapons program installations.

This project covers requirements of the weapons research and development facilities (Los Alamos National Laboratory (LANL), the Lawrence Livermore National Laboratory (LLNL), and the Sandia National Laboratories (SNLA and SNLL)), and the nuclear weapons testing facilities (the Nevada Operations Office (NV) and its contractors).

9. Purpose, justification of need for, and scope of project

A general plant project is necessary to meet new and changing program developments, to correct deficiencies, and for minor utility and road construction. Research developments and changes in technical program requirements frequently result in the need for altered or new construction items not previously anticipated. In the past, these changes have included building

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

alterations or additions to house new equipment for research, development, and testing functions; construction of new small buildings; extensions or modifications to utilities; and general area development.

The weapons general plant project estimate for FY 1985 of \$31,600,000 provides the level of effort essential to meet the existing programmatic requirements, requirements for maintenance and replacement due to the aging of the plant facilities and utilities, and other capital facilities. Adequate levels of general plant project funding are essential to halt the ongoing deterioration of the plant capital base. A large backlog of critically required general plant projects currently exist and continues to grow because of past underfunding in this area. The FY 1985 request represents the necessary level of funding to support general plant requirements.

The following subprojects are only examples of items of work which may be performed at the major locations covered under this project. These are grouped by location and under the following reason-of-need categories: Health, Fire, and Safety; Programmatic Needs; Pollution Abatement; Deteriorated Utilities; and Other.

The preliminary estimate of FY 1985 requirements by major area is as follows:

<u>Weapons Research and Development</u>	
Los Alamos National Laboratory	\$ 7,800
Lawrence Livermore National Laboratory	8,800
Sandia National Laboratories	7,500
<u>Nuclear Weapons Testing</u>	
Nevada Operations Office	7,500
Total	\$31,600

Los Alamos National Laboratory \$ 7,800

(1) Health, fire, and safety

a. Waterline cross-connection elimination \$ 500

This project represents the FY 1985 portion of an ongoing program to separate potable and industrial water systems between laboratory sites and within buildings. Work consists of piping modifications, installation of air-gapped storage tanks, and backflow preventer installations at locations having the highest priority for correction.

Subtotal - Health, fire, and safety \$ 500

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

(2) Programmatic needs

a. Data acquisition facility \$ 900

Work consists of constructing a 3,300-square-foot building in the ANTARES complex to provide a computer facility, photo processing facility, a data library complete with a terminal area, a digitizing room, restrooms, and storage area. This building is needed to consolidate data acquisition capabilities and improve efficiency in the study and analysis of data in support of the inertial fusion and weapons physics experiments.

b. Pinex calibration area \$ 650

Work consists of constructing a 1,600-square-foot building addition, a trailer parking pad adjacent to the new addition, and enlarging the existing loading dock. This building addition will house a febetron, recording equipment, and long-folded optical line-of-sight paths. The building addition is needed for the calibration of instrumentation for diagnostic testing used extensively in support of the weapons test program at the Nevada Test Site (NTS). The trailer parking pad will allow the existing mobile computer system to be used during calibrations.

c. Waste handling facility \$ 900

Work consists of constructing a 4,000-square-foot building addition at the plutonium facility. This building addition will provide space for sorting, compacting, and packaging radioactive waste materials from the plutonium facility for the Waste Isolation Pilot Plant (WIPP). Currently, waste materials containing radioactive residues are packaged in Fiberglass-coated plywood boxes and transferred to retrievable storage. This building addition is needed to house the equipment required to sort, compact, and package this waste in order to meet the requirements of the WIPP project.

d. Trailer bay \$ 600

A 1,200-square-foot, earth-covered trailer bay will be built to house a diagnostics trailer during explosive firing operations. This structure will permit improved logistics, short coupling distances, and ground-circuit integrity in connection with explosive-driven physics experiments.

Subtotal - Programmatic Needs \$ 3,050

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

(3) Pollution abatement

a. Sewage treatment plant improvements \$ 200

Work consists of installing a chlorination station at the sewage treatment plant. At present, the discharge from the sewage treatment plant is routed to the steam plant, chlorinated, and used as makeup water in cooling towers. Currently, the flows at the sewage treatment plant exceed the power plant requirements resulting in direct unchlorinated discharge. In addition, any downtime of equipment results in unchlorinated discharge. The discharge goes into Sandia Canyon which is used by the public. By providing a chlorination station, the discharge would be disinfected and provide protection to the public during their excursions to Sandia Canyon. This project will also allow the laboratory to meet both the National Disinfection Standards and the National Pollution Discharge Elimination System permit requirements.

Subtotal - Pollution abatement \$ 200

(4) Deteriorated utilities

a. Mechanical and electrical utilities upgrade \$ 750

Work consists of major improvements to ventilation, exhaust, electrical, and drain systems in a laboratory building that houses personnel and equipment for document production and associated services supporting the entire laboratory. The utilities were installed prior to the introduction of automated equipment and increased personnel, and existing systems are totally inadequate. The upgrading will be accomplished to utilities having the highest priority for correction.

b. Upgrade exhaust system \$ 650

Work consists of replacing the two main exhaust systems with two new units complete with stack, filters, and controls on the outside of the press building. Due to the increase in exhausted facilities, the existing system is marginal and costly to maintain. The filters must be changed frequently, as the slightest pressure drop across the filters reduces air velocities to an unacceptable level. This building and its facilities serve many laboratory-wide programs.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

c. Plant services improvements \$ 725

Work consists of improving items of a building service equipment nature and service systems in weapons buildings throughout the laboratory. Included are equipment and systems associated with compressed air, heating, refrigeration and air-conditioning, chilled water, and electrical. Generally, these systems and equipment are obsolete, undersized and/or extensively deteriorated due to overage (the average age of the physical plant at Los Alamos is about 21 years), and adverse operating conditions. The plant equipment and systems identified in this project have been slated for replacement because upgrading to optimum operating conditions by expense funded maintenance is either impossible or is greater than the replacement cost.

d. Replace explosion-proof heaters - weapons areas \$ 200

These explosion-proof heaters are a steam electric-type unit heater used in approximately 20 small explosive assembly buildings throughout the weapons areas. Due primarily to age, these heaters are developing casting pinholes which are very difficult or impossible to repair and still retain the integrity of U.L. approval for explosive services. Repair is costly and buildings cannot be used without temperature control.

e. Replace vacuum system, high-explosives (HE) buildings \$ 350

These buildings house explosives handling and machining operations. The vacuum systems are piped with screwed fittings which is contrary to explosive safety regulations. The tanks and piping are HE-contaminated making repairs troublesome and expensive. Systems are old and in poor condition.

Subtotal - Deteriorated utilities \$ 2,675

(5) Other

a. Laboratory expansion \$ 900

Work consists of constructing a 5,000-square-foot building addition on the west side of the physical metallurgy building. The addition will house group offices as well as a conference room. Currently, the physical metallurgy building is overcrowded and continues to grow in both personnel and equipment. By providing a facility for offices and a conference room large enough to accommodate an entire using group, communication, morale, and productivity will be greatly improved. The most beneficial contribution of this entire project is that the relocation of these offices will free valuable space needed by the physical metallurgy section and will alleviate overcrowding.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

b. Minor work items \$ 475

Minor work items usually vary in cost from several hundred dollars to perhaps \$25,000 though some may be larger. Inasmuch as many of those small jobs are unknown or of an emergency nature involving capital repairs or additions to the plant, it is impractical at this time to make an itemized list of the sorts of work that would be accomplished using FY 1985 general plant project (GPP) funds. Typically, work covered under this general category includes correction of routinely identified health and safety defects; minor fire protection improvements, such as fire mains and hydrants and small alarm and sprinkler installations; fencing and other minor safeguards improvements; replacements or improvements to roads, parking areas, and utility systems; and modifications and improvements to other facilities.

Subtotal - Other \$ 1,375

Lawrence Livermore National Laboratory \$ 8,800

(1) Health, fire, and safety

a. Fire sprinkler and alarm system upgrades \$ 950

As part of a continuing effort to upgrade fire safety at LLNL, fire sprinklers will be installed in five buildings to protect lives and equipment. In addition, an existing old and inadequate alarm system will be replaced.

Subtotal - Health, fire, and safety \$ 950

(2) Programmatic needs

a. Plating laboratory addition \$ 750

A 1,400-square-foot addition to the plating shop will provide space for a development laboratory and the consolidation of plating laboratory support equipment presently located in makeshift shelters.

b. High speed optics facility \$ 950

A new laboratory is required for the high speed optics facility at Site 300. The use of sophisticated optics for diagnostic experiments at Site 300 has outgrown the present facility.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

c. Target pit \$ 800

A new target pit for cyclograff experiments in atomic physics is required to support weapons program experiments. Existing facilities will not support current program requirements.

d. Cooling tower \$ 150

A nuclear building requires a new cooling tower to support test program requirements. The existing cooling system is running at capacity and is limiting expansion of required test diagnostics.

e. Building renovation \$ 600

Two old barracks buildings which are extremely deteriorated require extensive renovation to house programmatic equipment and personnel. No other space is available and no major new building or building additions will be constructed in time to meet these space requirements.

Subtotal - Programmatic needs \$ 3,250

(3) Deteriorated utilities

a. Computations building air-conditioning \$ 850

The existing computations building equipment bay has inadequate air capacity. This results in equipment being run with service access doors open which causes congestion and a safety hazard.

b. Replace chemistry air wash system \$ 950

This system is technologically inadequate. It requires constant water treatment for bacteria, has high maintenance costs; repair parts require manufacturing; and it produces high humidity, restricting high technology uses of the laboratories. The evaporator system will be replaced with refrigeration units.

c. Communication cable \$ 250

The existing communication cabling at Site 300 has deteriorated due to age and is unreliable, requiring the replacement of the entire system.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

d. Reconstruct site drainage and road improvements \$ 600

The abnormally heavy rainfall and heavy use by construction equipment has contributed to the deterioration of streets, roads, and site drainage systems. Replacement and improvements are required at several locations of the laboratory.

e. Utilities, building services, and systems improvements \$ 600

Building services, utilities, and related building equipment will be replaced as justified on the basis of obsolescence, inadequate capacities, and deterioration associated with wear, age, and adverse operating conditions.

Subtotal - Deteriorated utilities \$ 3,250

(4) Other

a. Upgrade main cafeteria \$ 350

The increased laboratory population as well as the increased utilization of the main cafeteria by laboratory personnel requires that the existing food preparation area be enlarged and renovated.

b. Weld shop expansion \$ 600

The addition of modern welding techniques, like laser welding, has created an overcrowded condition in the present weld shop. Requirements from various programs necessitate a variety of welding techniques.

c. Miscellaneous minor projects \$ 400

Requirements for small construction projects under \$85,000 will be completed under this category. Typically, these projects will include minor health and safety corrections, fire protection (such as small alarm and sprinkler additions), fencing, minor safeguards improvements, parking area changes, utility system extensions, etc.

Subtotal - Other \$ 1,350

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

Sandia National Laboratories \$ 7,500

(1) Health, fire, and safety

a. Addition to dosimetry laboratory, SNLA \$ 500

The Area V dosimetry laboratory provides dosimetry services for the reactors, flash x-ray facilities, and gamma irradiation facilities in Tech Areas III and V. The present building houses all of the counting systems, plus desk space for two staff members. The present building consists of two rooms, totaling approximately 600 square feet. The addition would add approximately 1,200 square feet to the laboratory area. The laboratory is already crowded and cannot make efficient use of the equipment. There is no work space for equipment repairs or for assembling and testing new or temporary systems. Furthermore, available space will not accommodate the additional counting and diagnostic equipment required by planned experimental programs. The dosimetry laboratory cannot continue to properly and efficiently provide complete dosimetry services for the Area V experimenters unless additional space becomes available.

b. Fire station, Tonopah test range (TTR) \$ 500

TTR has a need to centralize and improve its emergency rescue and firefighting capabilities. At present, equipment is stored in three separate facilities, which results in a seriously deficient firefighting and rescue operation. A new facility of approximately 1,800 square feet in area, centrally located between the REECo and Sandia compounds, would consolidate equipment and drastically reduce the response time to emergencies. This is especially important due to the increased capital investment over the past few years.

c. Emergency support facility, TTR \$ 750

This facility would be an addition to the existing facility which currently houses security and first aid. It would centralize the range emergency support services. At present, the equipment is dispersed in several substandard facilities. The addition would release approximately 600 square feet in the security building by relocating the first aid facility to the addition. This would relieve an overcrowded situation in the security building and provide needed office space and a training room, which is presently located in temporary remote facilities. The addition would be approximately 3,200 square feet in area and includes a garage to house three emergency vehicles, a medical facility, fire extinguisher charging room, emergency equipment storage, locker room, and restroom.

Subtotal - Health, fire, and safety \$ 1,750

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

(2) Programmatic needs

a. Support buildings for aerial cable facility, SNLA \$ 750

A 200-foot aerial cable was erected in 1968 as a field expediency for a series of ten tests. Before the tenth test was completed, three other programs were using this test site. The site has evolved into a heavily utilized test facility. A number of weapon programs continue to use the facility. Currently, the B28 is being tested for crosswind impact conditions. B61 ejection shock tests are conducted at the facility, and a heavy schedule of testing activities is ongoing in support of the B83. An 800-square-foot bunkered control point is needed to house operational equipment for test control and instrumentation. Included in this building would be certain items of electronic and photometrics instrumentation needed to support the activity of this facility. In conjunction with the control point, a 200-square-foot instrumentation bunker would be needed at the ground zero area to house instrumentation signal conditioning close-in to the test events. Underground instrumentation cabling would be required to interconnect these two buildings. There are no enclosed storage facilities at the site. As a result, test hardware and other support equipment has to be trucked over the road from the closest available enclosed space. A 600-square-foot explosive storage and assembly area is needed for in-line test preparations. An 800-square-foot inert storage building is required for test hardware and test fixtures being prepared for testing or being held for subsequent tests.

b. Warehouse for pulsed power facility, SNLA \$ 750

A warehouse of approximately 8,400-square-foot gross area is required for the receiving and storage of components for the pulsed power activities in Area IV.

c. Modify room for CADS, SNLA \$ 250

Space in an existing facility must be modified to house present and anticipated future acquisition of CADS equipment. Modifications will include raised floor and temperature, humidity, and dust control.

d. Addition to explosive test facility, SNLL \$ 800

The area between the firing facility and the explosive assembly facility is open to the weather. Walk areas between the building are wet and slippery during rainy weather, causing hazardous conditions for moving explosives between the two facilities. The conditions limit explosive test activities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

Auxiliary test equipment held in this exposed area becomes damaged when exposed to the weather. This project will enclose and weatherproof a 4,500-square-foot area between the facilities. Site drainage will also be improved to eliminate water run-off through the area.

e. Equipment and staging building for electromagnetic radiation and lightning facilities, SNLA \$ 250

A staging and equipment building is needed for use in assembly of equipment to be tested in the facilities and for storage of equipment which must be kept available, particularly spare parts for the lightning facility. The building will be 1,600 square feet with a 10-foot ceiling.

f. Optical fiber communication system, SNLA \$ 750

SNLA's data communications plan to improve data communications is based on a wideband optical communication network. This is a closed-loop network connecting strategically located technical control centers within the main technical area with an extension to remote area centers. Computer users have access through the control centers to local and remote distributed processors, as well as the central computing facility.

g. Radar facility, TTR \$ 250

The MPS-36 radar is one of two precision C-Band tracking radars supporting weapons testing at TTR. The radar is installed in an 8-foot by 40-foot van. There is a second 8-foot by 40-foot van which provides laboratory work space, radar parts storage area, office, and toilet facility. The two vans are connected by a wooden enclosure. The enclosure is an old uninsulated plywood structure used for protection of the radar transmitter section as a work space for repair of major items and as the location of the radar computer console and printer. This enclosure leaks water, snow, dust, and wind, and allows water to drip on the transmitter section of the radar. Operation of the radar must often be terminated in bad weather to cover up the transmitter. This causes severe operational problems during winter and thunderstorm months. The enclosure is a fire hazard to existing high value equipment. Work space is inadequate and in bad weather, especially winter, working conditions are unacceptable for most tasks.

The wooden enclosure and the work van will be replaced with an insulated 800-square-foot metal building. Since the radar station is a relatively remote site, it will be protected with a halon system integrated with the radar van.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

h. Welding and sheet metal shop, TTR \$ 450

The present ironworker and sheet metal shop share an inadequate 24-foot by 60-foot metal building with no restroom or office area. Material too large to be handcarried requires an operator and equipment to move the material in the shop. Due to the size of the building and interior perimeter equipment, shop fabrication is limited to very small items. Large work must be done outside in the weather. The proposed facility would be a 2,400-square-foot building with a 1,900-square-foot covered storage area at one end. A 5-ton bridge crane would run the length of the building and into the covered storage area to facilitate material handling without the use of additional support personnel. The building would have a sheet metal area, an open high bay area for fabrication, a lockable tool area, and space for drawings and catalogs.

i. Modification to weapons development facility \$ 600

This project provides for renovations and modernizations to the laboratories and offices in the weapons development facility. These improvements are required due to the age of the existing facility and the current usage of the facility.

Subtotal - Programmatic needs \$4,850

(3) Other

a. Addition to plant engineering building, SNLA \$ 600

An addition of approximately 8,000 square feet is needed to accomplish engineering efforts of the plant engineering organization. The additional space will be used for installation of an automated plant control center, expansion of the computer graphics area, relocation of personnel from mobile offices, and additional engineering, scheduling, and computer work stations.

b. Minor work items \$ 300

Minor work items usually vary in cost from several hundred dollars to perhaps \$25,000 though some may be larger. Inasmuch as many of those small jobs are unknown or of an emergency nature involving capital repairs or additions to the plant, it is impractical at this time to make an itemized list of the sorts of work that would be accomplished using FY 1985 GPP funds. Typically, work covered under this general category includes correction of routinely identified health and safety defects; minor fire protection improvements, such as fire mains and hydrants and small alarm and sprinkler installations; fencing and other minor

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

safeguards improvements; replacements or improvements to roads, parking areas, and utility systems, and modifications and improvements to other facilities.

Subtotal - Other \$ 900

Nevada Operations Office \$ 7,500

(1) Health, fire, and safety

a. Sewage lagoon modification, Area 12 \$ 830

This project provides for the construction of two new sewage lagoons to provide additional system capacity and to replace an existing 80,000-square-foot polishing pond. The polishing pond frequently overflows during periods of heavy storm runoff.

b. Sewage system modifications, Area 6 \$ 520

Four new retention/evaporative sewage lagoons will be constructed at the existing Yucca Lake sewage facility. The existing lagoons frequently discharge effluent onto the dry lake bed.

Subtotal - Health, fire, and safety \$ 1,350

(2) Programmatic needs

a. Two-part epoxy system \$ 900

This project will provide a second system for a two-part epoxy facility located in Area 1 at NTS. The facility will include storage, mixing, and dispensing capability of materials and other required products to meet epoxy formulas as directed by the users.

b. Materials testing laboratory expansion \$ 920

This project provides a 4,000-square-foot concrete block addition to the materials testing laboratory in Mercury. The existing facility is overcrowded due to additional testing requirements necessitating new equipment and personnel.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

c. Construct new bunker \$ 220

This project is to build a temperature controlled concrete bunker in Area 27. The bunker will allow storage of special nuclear materials and other classified parts.

Subtotal - Programmatic Needs \$ 2,040

(3) Deteriorated utilities

a. Replace nonshielded cable feeders \$ 340

This project will replace nonshielded cable feeders with shielded cable feeds in compliance with the National Electrical Code which requires the shielding of all solid dielectric insulated power cables operated above 2,000 volts.

b. Backup chiller, Control Point-1 (CP-1) \$ 200

Install a second 100-ton centrifugal water chiller in the basement of CP-1 to handle the added electronic and computer equipment necessary for the current level of testing. The present chiller is now running full capacity and when maintenance is required or a breakdown occurs, the building is without air-conditioning required for operation of the associated equipment.

c. Air-conditioning upgrade, Area 27 \$ 240

This project involves a general renovation of the interior air-conditioning system in the assembly building.

d. Upgrade water supply line, Area 12 \$ 540

This project will replace 17,500 feet of 4-inch pipe from Area 17 well to the Area 12 water storage tanks with 6-inch pipe to improve the water supply to Areas 12 and 2 to sustain operational needs and assure an adequate supply of water for fire protection.

Subtotal - Deteriorated utilities \$ 1,320

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

9. Purpose, justification of need for, and scope of project (contd.)

(4) Other

a. Security upgrade project \$ 900

Provide additional security for the NTS Control Point and main communications facility by extending the existing fence to encompass main communications facility and provide perimeter alarm and assessment systems.

b. Warehouse storage shed, Area 23 \$ 250

This project will provide a 5,300-square-foot shed and approximately 3,000 square yards of asphalt paving in the supply yard which will free-up space in an existing warehouse for increased quantities of high turn-over stock materials.

c. Truck engine heater power system \$ 70

This project will provide power to the truck dispatch area of the Mercury motor pool. This power will be used for truck engine block heaters to facilitate cold weather starting.

d. Administrative office building, Mercury \$ 850

This project will provide for a new 6,000-square-foot building to replace an existing deteriorated complex of small buildings which will be evacuated to allow the Mercury dormitories to be constructed in this area.

e. Upgrade Mercury streets \$ 720

The proposed project will resurface part of the existing streets in Mercury. Subject streets were built in the 1951-1953 time frame and are in need of repair. This resurfacing will extend the life of the streets 15-20 years. The existing streets are functioning at full capacity and a new asphalt overlay will solve the maintenance burden due to increased activity of Mercury.

Subtotal - Other \$ 2,790

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-101

10. Details of cost estimate

a. Engineering, design, and inspection	)	
b. Land and land rights	)	\$31,600
c. Construction costs	)	
d. Contingencies	)	
Total estimated cost		\$31,600

11. Method of performance

8 To the extent feasible, design and inspection will be performed under negotiated lump-sum architect-engineer contracts. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids. In some instances, it will be more economical or timely for design, inspection, procurement, or construction to be done by operating contractors and others already under contract to the Government.

12. Funding schedule of project funding and other related funding requirements

Not applicable.

13. Narrative explanation of total project funding and other related funding requirements

Not applicable.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, Phase I, various locations	2. Project No.: 85-D-102
3. Date A-E work initiated: 2nd Qtr. FY 1985	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 2nd Qtr. FY 1985	6. Current cost estimate: \$143,900 a/
Date: 1/84
4. Date construction ends: 1st Qtr. FY 1988	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 56,600	\$ 56,600	\$ 56,600	\$ 30,700
1986	79,100	79,100	79,100	40,900
1987	8,200	8,200	8,200	46,600
1988	0	0	0	25,700

8. Brief physical description of project

This project provides for the construction of new facilities; modifications, relocations, and additions to existing facilities; and new and replacement equipment for the nuclear weapons research, development, and testing (RD&T) facilities at the Los Alamos National Laboratory (LANL), the Lawrence Livermore National Laboratory (LLNL), the Sandia National Laboratories (SNL), the Nevada Test Site (NTS), and the North Las Vegas (NLV) ATLAS facilities. This project is a multiyear capital investment program to provide new or additional capabilities or capacities to revitalize the nuclear weapons RD&T complex. These new and modified facilities and equipment will replace or add to existing facilities that are overaged, deteriorated, overcrowded, or are inadequate to meet the capabilities required for the current and future weapons research and development (R&D) program and to achieve a long-term balanced test program. In addition to providing facilities and equipment in direct support of the RD&T program, this project also provides for necessary upgrades for environmental, safety, and health requirements within the nuclear weapons RD&T complex.

a/ The total estimated cost (TEC) is based on completed subproject conceptual design. This project is the first phase in a multi-phased effort to revitalize the RD&T complex. Our current planning estimate for the revitalization effort is \$1,850,000,000. This estimate is exclusive of the \$75,200,000 included in Project 84-D-107, Nuclear Testing Facilities Revitalization.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations	2. Project No.: 85-D-102
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8. Brief physical description of project (contd.)

The following briefly identifies the purpose and justification for the subprojects to be initiated in FY 1985.

Nevada Operations Office, Las Vegas, Nevada

Test Facilities Revitalization, NTS and NLV

This subproject will initiate revitalization at the NTS and NLV in five major functional areas: (1) reconfigure Forward Area camps to replace existing substandard, overcrowded camps and to free up prime test real estate; (2) develop Pahute Mesa by providing some permanent facilities, utilities, and improved roads; (3) test execution support by upgrading facilities to accommodate larger diameter devices and canisters; (4) replace common support facilities such as fire houses, health facilities, warehouses, and craft shops; and (5) initiate an effort to expand and replace personnel support facilities such as housing, dining halls, and recreation facilities.

(1) Develop Pahute Mesa

The objective of this development plan calls for: (1) the paving of the two access roads; (2) establishment of permanent materials and equipment storage facilities; (3) establishment of decontamination and heavy equipment service facilities; (4) upgrading of power systems to support multiple events; and (5) installation of a permanent water system along with supporting industrial, fire protection, and domestic requirements.

- a. Aerial Measurements Operations Facility - Las Vegas (TEC \$21,700,000; FY 1985 funding \$2,000,000)
Construction starts: 2nd Qtr. FY 1985 1/ Construction ends: 1st Qtr. FY 1988

This subproject provides for a new Aerial Measurements Operations (AMO) facility. The proposed AMO facility will replace the existing facility located adjacent to McCarran Airport and will provide a 115,000-square-foot building, illuminated aircraft parking apron with tie-downs, taxiway, paved vehicle parking, and all required utilities. The buildings will provide space for offices, light laboratories, mechanical and electronic assembly, computer operations, photograph processing, plant and maintenance, general storage and warehousing, and aircraft maintenance and operations. Currently, the specific site has been determined to be located at Nellis Air Force Base, Nevada.

This facility is required to replace the existing facility located on Escondido Road in Las Vegas, adjacent to McCarran Airport. The need for this replacement arises from three factors: expanded program requirements; the inadequacy of the existing space as related to operational and fire protection requirements; and the pending condemnation of the existing facility due to a planned new runway at McCarran International Airport.

1/ Site preparation involving the relocation of existing facilities at Nellis Air Force Base.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations

2. Project No.: 85-D-102

8. Brief physical description of project (contd.)

Aside from the programmatic and fire safety considerations, the existing facility will be condemned because of the planned airport expansion. Considering the period required to relocate prior to land condemnation, coupled with the expectation that construction costs will continue to increase, it is prudent to construct new facilities as quickly as possible consistent with reasonable and efficient construction planning.

- b. Pahute Mesa Road System, NTS (TEC \$10,000,000; FY 1985 funding \$2,500,000)
Construction starts: 4th Qtr. FY 1985 Construction ends: 4th Qtr. FY 1986

This subproject provides for upgrading the existing Pahute Mesa Road System to form a transportation loop connecting Yucca Valley to Pahute Mesa. The western portion of the proposed loop will be developed by improving Road 18-03 from its intersection with Airport Road westerly 2.4 miles to Buckboard Mesa Road, and Buckboard Mesa Road from its intersection with Road 18-03 northerly 11.6 miles to Pahute Mesa Road. The eastern side of the loop will be completed by improving Pahute Mesa Road from its intersection with Buckboard Mesa Road in Area 20 southeasterly some 22 miles to its intersection with Stockade Wash Road. The project will involve building up, realigning, widening, paving, and stripping roads 18-03 and Buckboard Mesa. It will also entail realigning, resurfacing, and stripping Pahute Mesa Road. Initial construction will improve the northernmost five miles of Buckboard Mesa Road south of its intersection with Pahute Mesa Road.

The Pahute Mesa Road System provides access to Pahute Mesa Test Areas. Approximately 30 percent of the weapons test program is planned to be conducted on the Mesa by 1985. Many sections of the existing paved miles are heavily potholed and washboarded and the rest is unpaved. These conditions make travel unsafe at speeds above 25 miles per hour. The deterioration and unpaved roads increase fuel consumption, raise vehicle maintenance costs, and require long leadtimes for equipment deliveries to event sites. The increased testing level on the Mesa will require the transportation of approximately 500 personnel daily, along with support vehicle and equipment traffic, which makes paving the Mesa Road system a critical project if the Mesa is to be a major test area.

(2) Test Execution Support

The objective of this development plan calls for: (1) upgrading facilities' capability and capacity to handle additional and larger devices and canisters; and (2) upgrading facilities used for equipment research and fabrication, calibration, installation, and monitoring to service the proposed balanced test program.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations	2. Project No.: 85-D-102
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8. Brief physical description of project (contd.)

- (a) ATLAS High Bay Expansion, NLV (TEC \$2,700,000; FY 1985 funding \$2,700,000)
Construction starts: 4th Qtr. FY 1985 Construction ends: 3rd Qtr. FY 1986

This subproject will provide a 140-foot by 80-foot enclosed assembly area between the existing ATLAS facility and the proposed staging assembly tower. This high bay expansion will be constructed of precast concrete panels attached to a structural metal support system. It will have a variable eave height stepping upward from 31 feet to 74 feet in 11-foot increments. The facility will also be equipped with two 30-ton cranes to provide the capability to assemble the number of canisters necessary to support planned testing levels. The demands of the long-term balanced weapons program dictate an increase in size, complexity, and quantity of canisters, which will require an increase in the ATLAS high-bay facility floor space. This project will provide an addition to enlarge the facility by approximately 11,200 square feet.

The present high bay consists of approximately 23,000 square feet of floor space, 2,700 square feet of which are dedicated to canister assembly. The average canister section requires 700 to 800 square feet of open floor space during assembly. Under present conditions, only three canister section frames can be assembled or pre-aligned simultaneously. Two complex events, comprised of two canister sections each, cannot be assembled on the floor at the same time. Increased floor time requirements due to increased canister complexity tend to aggravate the situation. A continuing increase in the diagnostic complexity associated with an underground test requires each diagnostic canister to spend 30 to 40 percent more time on the high bay floor during assembly. In addition, the planned number of tests performed will require a significant increase in canister throughput.

- (b) Diagnostic Assembly Tower - LANL, NTS (TEC \$4,900,000; FY 1985 funding \$4,900,000)
Construction starts: 2nd Qtr. FY 1985 Construction ends: 4th Qtr. FY 1986

This subproject will provide a portable diagnostic assembly tower for LANL's use at NTS. The tower will be a 20-foot by 20-foot by 200-foot space truss tower composed of five 30-foot modules, one 27-foot module, and one 23-foot module. In addition, there will be an electric-driven rack and pinion passenger/freight elevator with a 6,000-pound capacity independent support mast and a 500,000-pound capacity hydraulic hoist for moving racks to the vertical position.

The tower will provide for the assembly and alignment of diagnostic test equipment which collects data on nuclear weapons tests and provides a weatherproof work area for technicians, hardware, and specialized electronics equipment. A fixed amount of time is required for this process for each event, and this additional tower will allow work to be carried on for several events simultaneously. In addition, this tower is required to provide the added capacity to execute a balanced test program, as well as to provide the required capability to support the 98-inch diameter by 165-foot long diagnostic rack and nuclear device and the associated heavier weights.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations

2. Project No.: 85-D-102

8. Brief physical description of project (contd.)

Current towers will not accommodate the canisters planned for use in the program. Further, an additional tower is needed to support the additional number of tests to be conducted on the Mesa.

(3) Personnel Support Facilities

The objective of this development plan calls for upgrading the form of housing, dining halls, and recreation facilities; the plan's initial phasing calls for the construction of dormitories at Mercury and Area-12.

Dormitories - Mercury and Area 12, NTS (TEC \$3,500,000; FY 1985 funding \$3,500,000)
Construction starts: 2nd Qtr. FY 1985 Construction ends: 4th Qtr. FY 1986

This subproject continues the dormitory replacement activities initiated in FY 1984 under Project 84-D-107, and in FY 1985 will provide for the construction of two Type C-1 dormitories containing 59 single occupancy 10.9-foot by 12-foot rooms with a shared bath for every two units in a 2-story building. The buildings will contain a lobby, laundry, mechanical equipment room, janitor's closet, recreation room, and facilities for the handicapped.

These 118 units will replace a portion of the current 4-bed/shared bath trailers. The trailer units to be replaced have exceeded their use life by 200 percent, are in violation of DOE fire regulations, and do not provide appropriate or adequate accommodations for personnel who are on temporary assignment to NTS or who must stay on location because of work schedules and operating procedures. The NTS users and contractors believe that adequate, comfortable housing affects the calibre of personnel who they are able to attract and retain to work on the nuclear weapons test program.

Improved accommodations are required at the NTS to provide adequate living quarters for scientific and professional personnel who are required to reside at the NTS on a recurring semipermanent basis and also to provide adequate quarters for the permanent Mercury population. Existing housing at Mercury consists of: old trailers; wooden communal-type dormitories; concrete block bachelor officer's quarters; and two-story, motel-type dormitories. The acceptable bachelor officer's quarters and motel-type facilities will accommodate only 230 persons. During the first nine months of FY 1983, the average monthly peak overnight population was 800 persons. Thus, the monthly peak population exceeds by approximately 350 percent the space available in acceptable facilities. The peak population during an augmented test program is expected to be approximately 1,100 and will severely aggravate the situation.

During peak activity periods, housing scientific and technical personnel in Mercury has two advantages over accommodations in the nearest motels, which are 65 miles away in Las Vegas. First, motel accommodations in Las Vegas would represent a substantial cost to the Government. Second, the traveltime (about 2-1/2 hours per

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations

2. Project No.: 85-D-102

8. Brief physical description of project (contd.)

day) has a negative effect on efficiency and productivity, especially when these personnel are on extended workdays.

- (4) Test Revitalization Capital Equipment, NTS and NLV (TEC \$2,400,000; FY 1985 funding \$2,400,000)
Construction starts: 1st Qtr. FY 1985 Construction ends: 1st Qtr. FY 1986

This subproject will revitalize the capital equipment base of the nuclear weapons test complex with primary emphasis on the Nevada Operations Office (NV) Test Complex. It will provide the necessary capabilities and capacities to support an increased level of testing. The types of equipment to be provided include: heavy construction, vehicles, communications, shop, data recording, timing and firing, nuclear chemistry, underground test measurement, laboratory, and other test diagnostics.

The FY 1985 funding requirement continues revitalization of the capital equipment base at NV which was initiated in FY 1984 under Project 84-D-107. Equipment needs at NTS and NLV are important and, in many cases, critical to achieving a balanced testing program.

The NV equipment requirements cover a broad spectrum of items which include sophisticated diagnostic recording, communications, heavy equipment, security, automated data processing, office, and the largest vehicle fleet in the Department of Energy (DOE). There are over 45,000 items included in this inventory which, for the most part, is spread over 1,350 square miles of the NTS. Much of the equipment is subject to the climatological extremes of the desert environment, as well as ground shock from nuclear underground tests. A high percentage of the equipment is moved frequently over unimproved roads and rough terrain. All of these factors combine to reduce the useful life of NTS equipment. From the viewpoint of the laboratories, the same degradation has occurred in their equipment resources.

Recent years have seen significant advance in technology which should be used in diagnosing the performance of nuclear weapon designs. The use of digital equipment, new television cameras, fiber optic techniques, radiochemical detectors, and improved equation-of-state measurements could provide the weapons designer with a larger fraction of the information which is needed to improve weapon design.

The equipment requirement needs also take into account the planned increased test rate and the need to support the increased rate under a long-term balanced advanced physics and weaponization test program.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations

2. Project No.: 85-D-102

8. Brief physical description of project (contd.)

Lawrence Livermore National Laboratory (LLNL), Livermore, California

- a. High Explosives Applications Facility (HEAF), LLNL, CA (TEC \$43,700,000; FY 1985 funding \$24,000,000)
Construction starts: 3rd Qtr. FY 1985 Construction ends: 4th Qtr. FY 1987

This project will provide for construction of a laboratory office building of approximately 102,000 gross square feet of floor space. A large portion of the facility (67,000 square feet) will be below grade and will include spaces for high-explosive (HE) storage; precision shot assembly and instrumentation, contact and remote control HE operations in support of test firing, test cells for potentially hazardous HE studies, various sizes of enclosed firing chambers, control and diagnostic equipment; high-velocity gas gun, special shops, other small laboratories, and change rooms. The remainder of the facility will be above grade and will provide approximately 18,300 gross square feet of office, drafting, library, data reduction, and conference space for the HE program experimentalists and theorists. In addition, approximately 17,000 square feet of space will be required above the laboratories for mechanical and electrical equipment and gas expansion chambers.

Special equipment for operation of the HEAF will include a radiographic electron accelerator, electro-optical equipment, high-velocity gas gun, electronic instrumentation, data handling equipment, enclosed firing chambers (ranging from a few grams to multi-kg capacity), HE transfer containers, access control system, and a monitor system.

To maintain a strong and viable nuclear deterrent, the weapons laboratories have focused on these four areas: durability of our stockpile; reliability of our initiation systems; performance in terms of yield-to-weight ratio; and increased safety and its corollary, reduced vulnerability of our weapons.

HE technology is a common denominator which appears in an analysis of the needs of each of these areas. The HE system, consisting of a main explosive charge plus detonators, is used to implode the pit, making the nuclear explosion possible. HEAF will be a major factor in a vigorous HE research program from which we can expect major contributions to weapon performance, safety, and security. HEAF is a facility designed to provide us the testing capacity so that we can develop more reliable designs and materials.

The FY 1985 funding requested provides for initiating construction of the new building and the procurement of long lead-time special equipment.

- b. Tritium Facility Upgrade, LLNL, Livermore, CA (TEC \$5,700,000; FY 1985 funding \$700,000)
Construction starts: 2nd Qtr. FY 1985 Construction ends: 1st Qtr. FY 1988

This project will provide a 1,260-square-foot building equipped with pumps, blowers, surge tanks, catalytic converters, and replaceable absorption beds to serve as a standby recovery system. Modern gas processing equipment will be installed in the adjacent gaseous chemistry building to reduce releases of radioactive gases and minimize releases during emergency

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations	2. Project No.: 85-D-102
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8. Brief physical description of project (contd.)

situations. A vacuum effluent recovery system will be installed in the same building and a building addition of approximately 4,900 square feet will be built to provide 22 offices, a library, and space for other activities.

Mechanical utilities, power, and communications lines available at the existing building will be relocated as required to accommodate the proposed addition and alterations.

The purpose of this project is to provide safety and monitoring control of tritium systems and to reduce tritium releases to the environment to as low a level as reasonably practical. The existing once-through-airflow system was designed to protect building personnel from exposure, and small releases of tritium to the atmosphere were tolerated. Even though operations are currently within applicable safety regulations and guidelines, it is anticipated that regulations, environmental, and political concerns will require more stringent control systems for this facility. A vacuum recovery facility will recover small quantities of tritium that are now released in a controlled manner. A standby recovery system will protect against a large tritium release in the event of an equipment failure.

This tritium facility is used to provide for the continuing support of device tests at the Nevada Test Site, filling glass microsphere targets for the Inertial Confinement Fusion Program and basic research in the physical and chemical properties of tritium containing hydrogen isotopes. Because of the vital functions this facility performs, these safety improvements must be made to assure the continued use of this facility.

The FY 1985 funding requested will provide for Title I and Title II design for the tritium facility upgrade.

Los Alamos National Laboratory (LANL), Los Alamos, New Mexico

Advanced Radiochemical Weapons Diagnostic Facility, LANL (TEC \$7,800,000; FY 1985 funding \$1,800,000)
Construction starts: 2nd Qtr. FY 1985 Construction ends: 4th Qtr. FY 1987

This subproject will provide two new buildings to be constructed adjacent to the existing Radiochemistry Laboratory Building--a Radiochemical Diagnostics Laboratory, and an Isotope Separator Building.

The Isotope Separator Building will provide a new 3,000-square-foot building adjacent to the existing Radiochemistry Laboratory Building to house two isotope separators. The building will include approximately 2,100 square feet of isotope separator space and approximately 900 square feet for one office, a high-voltage electrical room, and a high-voltage source room. Two rooms will be constructed for isotope separators. One isotope separator will be provided new and one will be relocated from the existing Radiochemistry Laboratory Building. Fume hoods will be provided for the collection of acid fumes and some low-level radioactive particles. An exhaust system with high-efficiency particulate air (HEPA) filters and a stack will be provided.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations

2. Project No.: 85-D-102

8. Brief physical description of project (contd.)

Present separators at LANL have neither the high-transmission efficiencies nor the large separation factors needed for state-of-the-art analyses. LANL's ability to respond either to the demands of a balanced test program or to provide the weapons designer with the maximum radiochemical data required for optimizing weapons design is, therefore, severely limited. Failure to provide this capability will severely limit the application of important diagnostic techniques in the analysis of the performance of nuclear weapons and will limit the weapons designer's ability to develop new designs.

This building and the new isotope separator equipment that is to be housed will revitalize the radiochemical weapons diagnostics program at LANL. Isotope separation of elements recovered from nuclear weapons debris has played an increasingly important role in the detailed analysis of device performance. This new facility will provide the opportunity for further expansion and development of the application of radiochemical detectors to the nuclear weapons program.

The Radiochemical Diagnostics Laboratory will provide a 12,500-square-foot building west of the existing Radiochemistry Laboratory Building and will provide "clean" laboratory space for mass spectrometers and chemistry and standard chemistry laboratories, offices, stockroom, toilet/change rooms, and facilities equipment space. The laboratory space will include approximately 5,000 square feet of "clean" instrumentation space, approximately 3,000 square feet of "clean" chemistry space, and approximately 1,200 square feet of standard chemistry space. The laboratory support space of approximately 3,300 square feet will include office space, a stockroom, toilet/change rooms, data distribution room, and an equipment room.

Radiochemical diagnostics have historically played a definitive role in the evaluation of weapons performance. The development of new radiochemical techniques, involving state-of-the-art mass spectrometric methods, has presented the laboratory with an opportunity to extend and improve its ability to fully diagnose and understand the performance of nuclear weapons tested underground in Nevada. This laboratory is for further expansion of this mass spectrometric capability leading to routine application to weapons diagnostics. The laboratory's "clean" facilities are an absolute necessity for the "mass spec detector" program. Delay in funding, or failure to fund, will delay or severely limit the application of important diagnostic techniques to the testing of nuclear weapons.

Sandia National Laboratories, Albuquerque, New Mexico, and Livermore, California

- a. Weapons Laboratory Building, SNL, Livermore, CA (TEC \$20,400,000; FY 1985 funding \$11,000,000)
Construction starts: 2nd Qtr. FY 1985 Construction ends: 3rd Qtr. FY 1987

This project will provide a multistory building of approximately 77,000 square feet, consisting of light laboratory spaces, associated offices, and basement laboratory space plus equipment room. The project will include utility extensions and land improvements. This building will be a duplicate of the Safeguards Light Laboratory/Office building completed in FY 1980 in Albuquerque. The design has adapted the building to a new site, the structure has been modified for a different seismic zone, and the building entrances have been reworked. The equipment and support systems required to pursue state-of-the-art

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations	2. Project No.: 85-D-102
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8. Brief physical description of project (contd.)

weapons R&D will be provided and will include special laboratory furniture and fume hoods, cooling systems for heat producing experiments and data equipment, environment containment and control systems such as chambers and glove boxes, and prefabricated clean rooms for dust-sensitive research.

SNLL requires a new laboratory building to correct a serious and growing deficiency in the site's facilities for weapons related research and weapons system development. This laboratory building will provide the facilities required for several applied research activities that have been at the forefront of weapon evolution: electronics, applied physics, and materials science. These activities will provide the technological basis for weapon improvements throughout the remainder of the century. Fundamental understanding of the involved phenomena and its application to mission oriented projects is the bedrock of the weapons program. It minimizes the possibility for technological surprise while creating new opportunities for U. S. systems--e.g., the components and structures for modern, small diameter devices for NATO artillery; providing weapons with some intelligence through use of microprocessors for improved operational capability, safety, and security; and the development of new materials for smaller and lighter systems which satisfy more stringent requirements. Providing modern state-of-the-art laboratories for these activities is vital for continued weapons development.

For the last 15 years, laboratory space at SNLL has been provided mainly by converting warehouse and office space into laboratories. Warehousing has been displaced to sheetmetal buildings. People have been pushed from offices in permanent buildings to temporary substandard trailers and modulars. The result is that 30 percent of the weapons staff are in temporary quarters. Many are housed in overcrowded offices at scattered locations with poor services and inadequate utilities.

The acquisition and maintenance of temporary buildings and conversion of office and warehouse space to laboratories have been extremely costly. More importantly, because of limited adequate laboratory space, SNLL has not been able to adequately evaluate and apply critical processes which are needed for present and future weapon systems.

- b. Process Development Laboratory, SNL, Albuquerque, NM (TEC \$21,100,000; FY 1985 funding \$1,100,000)
Construction starts: 2nd Qtr. FY 1985 Construction ends: 4th Qtr. FY 1987

This project provides for the construction of a heavy laboratory and shop building of approximately 103,000 square feet gross area. Construction will include insulated metal panel exterior walls, concrete slab on grade, concrete masonry unit interior partitions and walls, poured-in-place concrete structural frame, and a roof structure of concrete double "T's" with built-up roof. This laboratory shop area, approximately 80,000 square feet gross, will be a high-bay area with a clear height of 22 feet. The office and operational support area will be low bay. Extending the entire length of the laboratory shop area will be mechanical chases to provide for the extensive mechanical system requirements. Beyond the typical heating, ventilation, and air conditioning and plumbing requirements will be special systems for gas handling and the exhausting of toxic materials and flammable gases.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations

2. Project No.: 85-D-102

8. Brief physical description of project (contd.)

The SNL main machine shop building and the welding/sheet metal foundry building are both more than 20 years old. Since the construction of these facilities, a number of specialty process activities have become a major part of SNL development functions. These activities (ceramics, plastics, physical electronics, process analysis, hybrid microcircuits, electronic fabrication, etc.) have continued to grow in importance and size due to new weapon systems requirements for increasing amounts of componentry utilizing these newer technologies. Inherent in these materials and process areas is the need for greater cleanliness, closer environmental control, and safeguards against potential physiological hazards.

In the absence of new buildings tailored to the job requirements, these functions have been crowded into the machine shop buildings and in temporary, substandard buildings that include metal Quonset and woodframe-type World War II era structures. This substandard space does not meet current fire codes and, after numerous modifications, is of questionable structural integrity. In these areas, necessary processes cannot be performed within acceptable environmental standards. These hazardous processes include: (1) the handling of lead containing ceramic powders; (2) amines and other suspected toxic plastic formulations; (3) hydrogen gas furnace operations; and (4) other processes requiring special environmental controls.

Providing adequate ventilation and effluent discharge for the required environmentally safe operating conditions would be impractical from a cost and functional requirements standpoint in many cases and physically impossible in some of the present processing facilities. Environmental requirements will be a prime consideration and an integral part of the new facilities basic design.

Without this new facility, several programmatic impacts can be identified: future weapons designs will be jeopardized by inadequate understanding of state-of-the-art manufacturing techniques and materials now becoming available to the production complex; SNL will be unable to specify complete product design definition to the production agencies for SNL designed components; already limited capability to "backup" production agencies will diminish further; capability for producing classified prototypes to support system and component development will erode further; environmental health concerns about heavy metals could require termination of the ceramics production activity, thereby eliminating a stockpile materials source; and additional process capabilities cannot be added without further safety degradations.

The FY 1985 funding requested will provide for Title I and Title II design.

The FY 1985 funding request is \$56,600,000; \$54,200,000 will be used for the design, procurement, and construction of facilities and roads; and the remaining \$2,400,000 will be used for the design, procurement, and fabrication of critically needed equipment at the following locations:

Nevada Test Site and North Las Vegas ATLAS Facility, Nevada	\$18,000
Los Alamos National Laboratory, New Mexico	1,800
Sandia National Laboratories, New Mexico and California	12,100
Lawrence Livermore National Laboratory, California	24,700
	<u>\$56,600</u>

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations	2. Project No.: 85-D-102
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9. Purpose, justification of need for, and scope of project

A decade of minimal construction and capital equipment funding for weapons RD&T has resulted in a stagnation and, in some cases, an erosion in the capabilities for the RD&T capital asset base. This project is the first phase in a multi-phased effort to revitalize the RD&T complex. The planning estimate for this effort over the next 7 or 8 years is about \$1,850,000,000 in escalated dollars, including line item construction subprojects, minor construction subprojects (less than \$1,000,000), and capital equipment.

The nuclear weapons RD&T program is made up of a highly complex set of activities extremely dependent on current and advanced technology facilities and equipment to meet its varied needs. In turn, the successful performance of the RD&T program contributes directly to the quality and reliability of the nuclear weapons stockpile. New weapon systems now require, in addition to unrelenting requirements for reliability and performance, new safety and safeguards features. These standards require innovative physics concepts and designs, the development of new materials and material applications, and extension of both engineering and manufacturing technologies beyond the current "state-of-the-art." Without providing the facilities and equipment necessary for this RD&T effort, the United States risks losing its superiority in nuclear weapons technologies.

Revitalization effort was initiated in FY 1984 with Project 84-D-107, Nuclear Testing Facilities Revitalization. That project was defined based upon needs identified in a test study completed in January 1982. The study was conducted by a task force comprised of representatives from the Office of Military Application, Nevada Operations Office, and the three weapons laboratories. All aspects of the test complex capital asset base were critically reviewed during the study and priority resource requirements necessary to achieve and sustain a balanced, long-term test program in excess of the FY 1981 level of testing were identified.

Several factors have contributed to the current situation as it relates to testing facilities. One such factor is the history of the overall test program itself. The history has been one of great fluctuations and very dynamic programs. These programs have fluctuated over the years due to political uncertainties and shifts in national policy relating to underground nuclear testing and nuclear deterrence. Many of the NTS facilities are temporary and were built 10-20 years ago and are now completely overage and deteriorated. Within the laboratories, capital funding for facilities dedicated to the test program has been sporadic at best. Many facilities now in use were built originally for other purposes. Another factor is the combination of increased complexity and workload confronting the program. To a large extent, the requirements for information in the test program mirror the pace and scope of the underlying research and development effort. As designs become more complex and the frontiers of technology are pushed out further in the laboratories, more information of increasing detail is required from each experiment associated with a device test. Today's device tests are much more complicated than tests conducted 10 years ago. Couple this with an overall increase in the DOE and work for others testing workload, and it becomes obvious that additional diagnostic capacity and capability will be necessary at the NTS and the laboratories if the test program is to continue to support the research and development process in a timely and effective manner.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations

2. Project No.: 85-D-102

9. Purpose, justification of need for, and scope of project (contd.)

Recently, a similar study was made of the R&D capital asset base at the three nuclear weapons design laboratories and NV. This study identified the plant and capital equipment (P&CE) requirements necessary to support long-term R&D objectives and requirements for environmental, safety, and health; etc. This project, 85-D-102, reflects the results of that study and includes the remainder of the test revitalization program initiated in FY 1984 as Project 84-D-107.

The consolidation of the nuclear weapons RD&T revitalization needs into one project data sheet focuses the issue of the total needs of the RD&T program and is illustrative of the interdependence of the R&D and test programs to: (1) develop and apply nuclear weapons technology to maintain and improve current weapon systems, and (2) develop new weapons for the nuclear weapons stockpile in accordance with national security requirements.

10. Details of cost estimates a/

Total cost

a. Engineering, design, and inspection	)	
b. Construction costs	)	
(1) Improvements to land	)	
(2) Buildings and building modifications	)	\$143,900
(3) Special facilities	)	
(4) Utilities	)	
c. Standard equipment	)	
d. Removal cost less salvage	)	
e. Contingency	)	
Total estimated cost		\$143,900

The estimates by location are as follows:

Nevada Test Site and North Las Vegas ATLAS Facility, Nevada	\$ 45,200
Lawrence Livermore National Laboratory, California	49,400
Los Alamos National Laboratory, New Mexico	7,800
Sandia National Laboratories, New Mexico and California	41,500
	\$143,900

11. Method of performance

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

a/ Based upon completed conceptual design reports.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons research, development, and testing facilities revitalization, various locations

2. Project No.: 85-D-102

12. Funding schedule of project funding and other related funding requirements

	Prior Years	1985	1986	FY 1987	1988	1989	Future Years	Total
a. Total project funding								
1. Total facility costs								
(a) Construction line item ...	\$ 0	\$30,700	\$40,900	\$46,600	\$25,700	\$ 0	\$ 0	\$143,900
Total facility costs ...	\$ 0	\$30,700	\$40,900	\$46,600	\$25,700	\$ 0	\$ 0	\$143,900
2. Other project funding								
(a) Conceptual design	\$ 725	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 725
(b) Other project related funding	0	0	0	0	0	0	0	0
Total other project funding	\$ 725	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 725
Total project funding (item 1 & 2)	\$ 725	\$30,700	\$40,900	\$46,600	\$25,700	\$ 0	\$ 0	\$144,625

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
1. Other project funding
- (a) Conceptual design

Conceptual design cost of \$725,000 was necessary to develop a budget quality cost estimate and construction schedule.

- (b) Other related funding requirements

The estimated programmatic life of these facilities varies by site and subproject.

The other related funding requirements for these facilities are not considered to be significantly different from those of the facilities and equipment being replaced by this project. Therefore, no costs are shown.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California	2. Project No.: 85-D-103
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 4th Qtr. FY 1985	6. Current cost estimate: \$40,100
Date: 1/84
4. Date construction ends: 1st Qtr. FY 1988	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1985	\$ 4,700	\$ 4,700	\$ 4,700	\$ 2,400
	1986	26,800	26,800	26,800	10,300
	1987	8,600	8,600	8,600	15,000
	1988	0	0	0	12,400

8. Brief physical description of project

This project provides for safeguards and security (S&S) enhancement of the Lawrence Livermore National Laboratory (LLNL) and the Sandia National Laboratories, Livermore, (SNLL) sites. This project covers three principal areas of construction and equipment: (1) the LLNL site, (2) the LLNL Site 300, and (3) the SNLL site. Facilities and equipment enhancements will be directed toward increasing features to delay intruders; improved intrusion detections, alarms, and access controls; upgraded communications/assessment capabilities; and improved special nuclear materials (SNM) accountability and control.

Physical security improvements will include replacement of outmoded alarm systems, additions to or upgrading of existing alarm systems, and new systems to enhance reporting and assessment of intrusion alarms. Closed circuit television (CCTV) surveillance systems, new fences, and lighting will be installed consistent with the buffer land acquisition security plan.

The projects also provide for: (1) the construction of new hardened security and communication buildings, (2) the upgrading of security communication systems, (3) the hardening of engineering test facilities, and (4) improvements to the SNM accountability and control system.

The following briefly identifies the S&S enhancements to be initiated at the LLNL, LLNL Site 300, and SNLL sites.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

8. Brief physical description of project (contd.)

a. LLNL, Livermore site

Buffer zone security provisions

This work consists of fencing the new north and west buffer zone and the onsite east buffer zone and providing vehicle access and maintenance roads, lighting, and surveillance CCTV monitors with pan, tilt, and zoom capabilities.

Security communications and control center addition

Construct a 2,240-square-foot addition to the basement communications area in the security building at Livermore. This project will house the controlled access by individual number (CAIN) computer and the interactive alarm system computer, provide space for the emergency generators and uninterrupted power service in a hardened facility, and allow the communications console to expand and incorporate the new alarm and monitoring hardware.

CAIN - Phase II

The new CAIN system will be developed to handle an enrollment capacity of 12,000 individuals expandable to 18,000. Initially, the system will include 90 access booths and 200 card reading door locks which can be expanded to 500 access control points. A dual computer will be provided with applicable supplier-developed software where possible. Included in the system are dual central processing units (CPU) providing 100 percent backup, intermediate controllers serving as a buffer for information exchange between individual access points and the CPU, a television (TV) assessment subsystem to help resolve anomalies, and data link cryptographic protection.

Interactive alarm for classified and SNM areas

This will provide an upgraded and expanded detection/alarm system of 500 channels expandable to 1,000 channels with interactive capabilities. The system will include a computer, improved transmitter, receiver, and computer interface hardware, and a geographic mapping alarm display.

Upgrade security radio communications system

The following security radio backup facilities will be provided:

- Three VHF and one UHF tone control base stations
- A microwave relay station between Livermore and Site 300.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

8. Brief physical description of project (contd.)

These items include associated radio towers, antennas, cables, hardware, remote control units, battery powered backup units, cabling, power, and site work. Personal secure radio (hand-held) and associated base station units are also included in this category.

Improve SNM accountability and control

Additional analytical equipment for the materials management group must be purchased to provide improved nondestructive evaluation. This includes a high level neutron coincidence detector and well counter and a new computer system.

b. LLNL, Site 300

New security communications and control center, Site 300

Construct a new 9,800-square-foot security communications and control center at Site 300. The hardened basement (4,040 square feet) will include the alarm console, the emergency operations center, a communications equipment room, three offices, and the armory. Existing alarm and communication cable will be rerouted and reconnected. The first floor will house the squad room, exercise/training room, shift preparation room, conference room, toilets, locker and shower rooms, garage (for emergency vehicles), electronic technician's shop, vending and kitchen, and three offices. Redundant units shall serve the alarm system such that no single failure will shut down the system.

New hardened environmental test complex facilities

Two existing test facilities will be replaced with 1,000-square-foot hardened buildings. Exterior walls of these two buildings will be reinforced concrete or other comparable material with severe service doors to provide an acceptable delay time factor. Services will include water, power, and communications. Normal building power distribution, lighting, communications, and air-conditioning will be installed. Building facilities also include lighting protection, fire protection, and a brine system.

Interactive alarm for classified and SNM areas

This will provide an upgraded and expanded detection/alarm system of 100 channels expandable to 200 channels with interactive capabilities. System will include a computer, improved transmitter, receiver, and computer interface hardware, and a geographic mapping alarm display. Two separate signals shall be sent from all critical alarms to the alarm console in the new security communication and control center.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

8. Brief physical description of project (contd.)

Upgrade security radio communications system

The following security radio backup facilities will be provided:

- Four VHF and one UHF tone control base stations.

These items include associated radio towers, antennas, cables, hardware, remote control units, battery powered backup units, cabling, power, a 150-square-foot building, and site work. Personal secure radio (hand-held) and associated base station units are also included at Site 300 in this category.

c. SNL, Livermore Site

Perimeter intrusion alarm system

23 The buffer zone land to be acquired under a separate line item will be fenced at the perimeter and also at 500 feet (minimum) into the site to create a secure zone. Security access roads will be constructed in the buffer land around the perimeter of the site. To detect when perimeter security buffer zones have been penetrated, a CCTV motion detection system will be installed, along with redundant fence protection and ultrasonic and cable sensors. The CCTV motion detection system will also provide a constant surveillance of the buffer zone.

New security operations and communications building

This portion of the project will afford a 6,000-square-foot security operations and communications building. The basement will be hardened and house the communications and control center and related operations for the new security system. A squad room, exercise/training room, shift preparation room, lockers, and showers will occupy the ground level.

Upgrade security radio communication system

To protect internal security communications, the radio base stations, transceivers, towers, antennas, and other associated equipment will be expanded. Existing emergency external capabilities with LLNL and local law enforcement agencies will also be strengthened.

The FY 1985 funding will be used to initiate tasks at the LLNL, Livermore site, the LLNL Site 300, and the SNL, Livermore site. This includes hardening of test complex facilities, new security communications/control center Site 300, new security operations communications building, SNLL, interactive alarm system for LLNL, and expansion and improvement to CAIN access control system for LLNL.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

9. Purpose, justification of need for, and scope of project

An effective S&S system is an aggregation of the protective mechanisms which contribute to the reduction of risks from the actions of an adversary. The threat spectrum considered for this project ranges from political demonstrators, who are relatively peaceful but may intrude into the laboratories to gain media attention and cause disruption, to antinuclear extremists and terrorists who intend to sabotage facilities and/or engage in the theft of SNM. The threats posed by disgruntled employees, who may act alone or in collusion with other employees, and/or external adversaries for the purpose of espionage or sabotage have also been factored into the scope of this project.

An assessment of the risks posed by this range of threats indicates the need for substantial improvements in the LLNL and SNLL physical protection systems. Existing safeguard alarms, detection assessment systems, and signal linkages are technically obsolete and need upgrading and/or replacement. These systems have grown to the point where they have reached capacity and utilized all available space in security facilities at SNLL, LLNL, and Site 300. Further, central equipment and consoles must be housed in a hardened facility to protect the heart of the security systems.

62 Differences in site-specific geographical characteristics of the LLNL and SNLL sites and the LLNL explosives testing site (Site-300) require differing approaches to improving the protection system. The needs for upgrading the elements of the S&S system for all three sites are described and justified in the following sections. The protection system elements that must be addressed include deterrent and delay measures, detection, alarms and access controls, communications and assessment capabilities, and SNM accountability and controls.

a. LLNL, Site

1. Buffer zone security provisions

The buffer land acquisition, various locations, project (83-D-199) was funded by Congress in FY 1984 with an initial appropriation of \$7,000,000. House Report 98-124 stated that the acquisition of relatively small, strategically located parcels of land adjacent to certain weapons facilities would improve physical security and prevent potential damage or sabotage of buildings and equipment. Compared to the possible damages, this program is highly cost-effective.

In support of the buffer land acquisition project and to provide an effective and visible deterrent and delay barrier to a potential intruder, the buffer zone must be provided with security measures such as fences, lighting, perimeter road, and CCTV surveillance system incorporating motion detection. These improvements are necessary to reduce the frequency of adversary actions through visible deterrence and, if such actions were attempted, reduce the probability by timely interdiction/interruption.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

9. Purpose, justification of need for, and scope of project (contd.)

2. Security communications and control center addition (communications and assessment capabilities)

The existing hardened basement of the security building must be expanded to provide space for more CCTV channels (45 of the available 48 are now in use with many new classified weapons facilities coming on line), relieve the existing overcrowded operating conditions, allow greater ease of maintenance, and improve equipment layout to reduce the existing high noise level at the console operator/dispatcher area. In addition, space is needed for the new CAIN and interactive alarm system computer hardware.

3. CAIN (Access Control)

Personnel access control, a key factor in an effective S&S program, is normally a function of the guard force or electronic identification or a combination of these. The proposed upgrade and expansion of the 10-year-old (CAIN) system will provide LLNL with the ability to insure more reliable access control for authorized personnel to protected and material use areas containing SNM and/or classified information and minimize inconvenience and delay to LLNL personnel. It will also maximize the cost-effective use of protective service personnel by using a computer access system rather than manpower.

This upgraded CAIN system (Phase II) includes a new distributed computing system. It will provide an extremely reliable central system that will handle access authority files and recordkeeping. The central system will also oversee the security audit, assuring that users do not engage in improper transactions. Local microprocessors will handle the actual entry point security and aperture management details. Standard equipment will be used where possible to keep future support costs down. No known alternate technology is available which is capable of providing the necessary security, speed of operation, reliability, ease of management, and cost-effectiveness of computer-based access control.

4. Interactive alarm system for classified and SNM areas (detectors and alarms)

An upgraded and expanded detection/alarm system with interactive capability will provide LLNL's security department with a reliable system that allows immediate notification and coordinated control of all perimeter surveillance alarms and alarmed facilities in which classified parts, information, and SNM are stored. The proposed system will provide an enhanced identification system and increased computer capabilities.

Setting alarms in the "secure" or "access" mode in SNM areas and other storage facilities containing classified parts and/or material is presently a cumbersome, time-consuming, manual system. The proposed state-of-the-art system would provide new and significantly improved identification/control and reliability in the security network.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

9. Purpose, justification of need for, and scope of project (contd.)

5. Upgrade security radio communications system (communications and assessment capabilities)

Security backup radio stations with associated towers and antennas are required at Livermore and a relay station between Livermore site and Site 300 to assure the availability of radio communications for the security department in emergency situations. Also, to reduce vulnerabilities, cables from the security control centers to the towers and equipment must be buried. Furthermore, hand-held secure radio units are necessary to provide prompt, secure communications between tactical security forces and the command/control center.

6. Improve SNM accountability & control

On a continuous basis, the ability to accurately determine quantitatively and qualitatively SNM being received and shipped or internally transferred between material balance areas is often critical to resolving differences and assuring reliable inventory records. Additional measurement equipment is needed to upgrade LLNL's nondestructive analytical capability and a new computer to handle reports and track materials.

The existing computer now used by the accountability group is 7 years old, is reaching obsolescence, and has a marginal capacity to handle adequately all existing accountability and material control activities.

b. LLNL, Site 300

1. New security communications and control center (communications and assessment capabilities)

The present security building at Site 300 is an old, lightweight structure in a vulnerable location near a public road. A new hardened security communications and control center is required for Site 300 to protect security's central communication and alarm system, provide for expansion as increased facility surveillance and alarms are added to this system, provide an adequate emergency operations center, and assure the protection of the security force. The new building will be sited away from the public road, reducing its vulnerability to adversary action. This building will also provide training facilities, an armory, and a secure garage for the armored patrol vehicles.

2. Hardening engineering test facilities at Site 300 (deterrent and delay measure)

The LLNL's explosive test site (Site 300) is located about 17 miles to the east of the Livermore site in a very hilly terrain. Explosives test bunkers and the engineering test facilities are scattered in canyons throughout the 11.6 square miles of the site. These facilities are used for the dynamic mechanical and environmental testing of nuclear-explosive-like assemblies containing SNM and for the processing and storage of classified SNM parts. To reduce the risks of successful attacks by armed adversaries on these facilities requires two hardened engineering test facilities that are essential to the LLNL nuclear weapons program.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

9. Purpose, justification of need for, and scope of project (contd.)

3. Interactive alarm systems for classified and SNM areas (detectors and alarms)

As is true at the Livermore site, an upgraded and expanded detection/alarm system with interactive capability is necessary to provide the Site 300 security department with a reliable system that allows immediate notification and coordinated control of all alarmed facilities in which classified parts, information, and SNM are stored. The proposed system will provide an enhanced identification system and new computer capabilities.

4. Upgrade security radio communications system (communications and assessment capabilities)

Security backup radio stations with associated towers and antennas are required at Site 300, as at the Livermore site, to assure the availability of radio communications for the security department in emergency situations. Hand-held secure radio units are also necessary to provide prompt secure communications between tactical security forces and the command/control center.

c. SNLL Site

1. Perimeter intrusion alarm system

Acquisition of buffer zone property necessitates that additional intrusion alarm systems and security fencing be acquired to provide early detection and assessment of intruders. The perimeter security road would aid in both the patrol of the new buffer zone and apprehension of any intruders.

2. Security operations and communications building

A new hardened security operations and communications building is required to protect security's central communication and alarm system nerve center. Recent vulnerability analyses and security surveys have emphasized the need to relocate critical security activities internal to the site, thus reducing their vulnerability. This building will also provide appropriate facilities for centralizing all guard force and physical security related activities as well as an emergency operations center.

3. Upgrade security radio communication system

Upgrading of the radio communication system is required to provide communications secure from news reporters and others who continually monitor SNLL frequencies to gain information on patrol activity, emergencies in progress, routine communication which may divulge information to an adversary--such as arrival or departure of safeguards secure trailers, etc. The upgraded system will provide secure communication with LLNL and law enforcement agencies and will provide an

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

9. Purpose, justification of need for, and scope of project (contd.)

increased level of duress reporting. SNLL began a minimal conversion to a secure radio system with digital voice protection in FY 1982-FY 1983 with the acquisition of a base station and five portable transceivers.

10. Details of cost estimates a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 14% of construction costs, item b ...		\$ 3,110
b. Construction costs		21,650
(1) Improvements to land, including grading, paving, parking, fencing, and walks	\$ 2,740	
(2) Security communications/control center - Site 300	1,800	
(3) Security communications/control center addition - Livermore site	580	
(4) Security communications/operations building - Sandia site	1,300	
(5) Hardened test facilities (2) - Site 300	390	
(6) Utilities - electrical, water, power, communications, sewer, and area lighting	4,940	
(7) Special facilities including CAIN access control systems, interactive alarm system radio base stations	9,900	
c. Standard equipment includes IAS and CAIN computer hardware, secure personal radios, surveillance TVs, accountability/material control computer		\$10,490
d. Removal cost, less salvage		40
	Subtotal	35,290
e. Contingency at approximately 14% of the above		4,810
	Total estimated cost ...	\$40,100
The estimates by location are as follows:		
Lawrence Livermore National Laboratory, Livermore, California		\$35,000
Sandia National Laboratories, Livermore, California		5,100
Total		\$40,100

11. Method of performance

Design will be on the basis of a negotiated architect-engineer contract. Minor work and equipment procurement will be performed by LLNL and SNLL. To the extent feasible, construction and procurement will be accomplished by fixed-price contract awarded on the basis of competitive bidding.

a/ Estimate based upon a completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$ 0	\$ 2,400	\$10,300	\$15,000	\$12,400	\$40,100
Total facility costs	\$ 0	\$ 2,400	\$10,300	\$15,000	\$12,400	\$40,100
2. Other project funding						
(a) Conceptual design	\$ 150	\$ 0	\$ 0	\$ 0	\$ 0	\$ 150
Total other project cost	150	0	0	0	0	150
Total project costs (items 1 and 2)	\$ 150	\$ 2,400	\$10,300	\$15,000	\$12,400	\$40,250

b. Other related funding requirements (estimated life of project: 30 years)	
1. Facility operating costs	\$ 210
2. Programmatic operating expenses directly related to the facility	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility	0
4. GPP or other construction related to programmatic effort in the facility	60
5. Other costs	0
Total other related annual funding requirements	\$ 270

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
1. Other project costs
- (a) Conceptual design costs
Approximately \$150,000 was required to prepare a conceptual design, preliminary schedule, and cost estimate for this project.
- b. Other related funding requirements
1. Facility operating costs
- Facility operating costs of \$270,000 are projected to cover the costs of maintenance and utilities for the project.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security enhancements,
LLNL and SNL, Livermore, California

2. Project No.: 85-D-103

13. Narrative explanation of total project funding and other related funding requirements (contd.)

2. GPP or other construction related to programmatic effort

Initially no GPP costs are anticipated but, to keep abreast of technology, presently undefined alterations will likely be required in the future.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Test devices assembly building,
Los Alamos National Laboratory, Los Alamos, New Mexico	2. Project No.: 85-D-104
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 1st Qtr. FY 1986	6. Current cost estimate: \$10,500
Date: 1/84
4. Date construction ends: 1st Qtr. FY 1988	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 800	\$ 800	\$ 800	\$ 600
1986	9,700	9,700	9,700	3,100
1987	0	0	0	3,900
1988	0	0	0	2,900

8. Brief physical description of project

This project will provide an explosive devices assembly facility with nondestructive evaluation capability. An addition to the same building will provide support space. This project will also provide multiple safeguards and security improvements in the areas of special nuclear materials (SNM) control and physical protection of devices.

The assembly cell will contain approximately 900 square feet of usable space. The design will be based on the "Gravel Gertie" concept and will be designed to contain the blast effects fragments and to limit the spread of radioactive contaminants if an accidental detonation occurs. The assembly cell will be buried with the roof, which consists of a catenary cable system, supporting a gravel mass approximately 15-feet thick which will act as a pressure ballast and contaminant absorbent. The structural system will be reinforced concrete in the shape of a cylinder with a 34-foot inside diameter.

Personnel and equipment access to the assembly cell will be provided through a tunnel with an air lock shielded by blast doors. The air lock will provide a means of sealing the gases and particulates inside the defined containment area, forcing these materials to vent through the gravel roof but allowing personnel outside the cell to avoid pressure shocks and the fire ball.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Test devices assembly building,
Los Alamos National Laboratory, Los Alamos, New Mexico

2. Project No.: 85-D-104

8. Brief physical description of project (contd.)

The support addition to the existing structure will be approximately 1,600 square feet in area and will be constructed of concrete masonry units for the exterior walls with light-steel roof framing. The addition will house a four-man office, a counting room adjacent to an existing vault, a rest area, a toilet, a fixture storage room, the enlargement of an existing equipment room, and the addition of two missile-resistant doors to the existing high-bay area of an adjacent building. Two 2-inch diameter core-drilled holes will be required in the vault wall common to the counting room and existing vault.

The area of the hardened structure that will house the radiographic support will be constructed of reinforced concrete. This area will provide space for the accelerator, power supply, and repair bench; a control room; a film dark room; and a mechanical equipment room. A concrete wall will provide radiation shielding for the personnel in the control room. A radiation shield door will also prevent access to the assembly cell during the radiographic operations. This door will operate on an interlock system that will be activated before the radiographic equipment will operate.

8 The existing access road to the high bay of the adjacent building will be excavated to dock height to provide a dock on the south side of the building. A dock leveler will be installed on the dock.

Approximately two acres of land will be cleared of trees and underbrush. An existing berm plus approximately 26,000 cubic yards will be used for backfill and berm over the buried structures. Approximately 450 square yards of existing asphalt paving will be removed. Approximately 1,100 square yards of asphalt paving will be required for new service/access roads and parking near the facility.

The lighting system around this project perimeter will be upgraded to provide lighting levels required for closed-circuit television (CCTV) surveillance. Power is available from an existing substation. An uninterruptible power supply (UPS) will be provided for the perimeter lighting, the CCTV, and the hardened guard facility. An emergency generator (30 kW) will provide backup power for the UPS, the perimeter lighting, the CCTV, and the hardened guard facility.

The existing guard station will be replaced with a hardened guard facility. A doubled security fence will completely enclose buildings. The security fences will be 8 feet high with both fences topped by general-purpose barbed-tape obstacle (GPBTO). The fences will be spaced 20 feet apart with six rows of GPBTO placed between them. Two 16-foot motorized gates and a vehicle traffic-control barrier will be installed at the guard station. The perimeter lighting will require some upgrading to accommodate CCTV in the vicinity of the existing building.

Alarms and motion detectors will be installed throughout the facility: at all exits from the building, in the existing assembly bay and vault of the adjacent building, and in the assembly cell of the new facility. All vault doors will be equipped with two built-in locks.

The FY 1985 funding will be used to initiate design of the facility.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Test devices assembly building, Los Alamos National Laboratory, Los Alamos, New Mexico	2. Project No.: 85-D-104
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9. Purpose, justification of need for, and scope of project

This project will provide an explosive devices assembly facility with a nondestructive evaluation capability. The construction will provide attenuation of the blast effects and limited containment of the radioactive materials if an accidental detonation occurs. The structure will be designed to withstand one such event. The facility will contain a Class II, high-explosives plutonium activity as defined by Department of Energy (DOE) Order 6430, Chapter 22.

Test device assembly is an important part of the Laboratory's weapons development mission. These devices have been assembled in an existing assembly building for 30 years with an excellent safety record and in compliance with appropriate standards and regulations. The probability of an accidental detonation and the resultant spread of plutonium has thus been proved to be very low. However, increasing social sensitivity to environmental and health considerations dictates that the dispersal of radioactive contaminants must be limited if a detonation occurs.

89 The "Gravel Gertie" concept provides proved, economical containment of the blast effects and limitation of the spread of contaminants. Strengthening existing structures or siting the facility elsewhere than in Los Alamos is neither cost effective, efficient, nor reasonable.

The support addition provides space for administrative activities, subordinate assembly functions, and a safe personnel rest station that is in direct support of the assembly operations.

Radiographic examination of the test devices and their components is required to ensure proper assembly and alignment. Providing radiography at the assembly facility will effect savings in time, efficiency, and handling.

In addition to the safety and programmatic benefits to be provided by this project, the safeguards and security of the Los Alamos National Laboratory (LANL) nuclear weapons assembly operations are significantly enhanced by the construction of this facility.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Test devices assembly building,
Los Alamos National Laboratory, Los Alamos, New Mexico

2. Project No.: 85-D-104

10. Details of cost estimates a/	Item Cost	Total cost
a. Engineering, design, and inspection		\$ 950
(1) Facility at about 16% of construction costs less Item b.(4)	\$ 605	
(2) Special facilities equipment design at about 10% of Item b.(4)	345	
b. Construction costs		7,260
(1) Improvements to land	950	
(2) Buildings		
(a) Test device assembly cell	715	
(b) Assembly cell complex, includes corridor, radiographic room, control room, dark room, main corridor, and mechanical equipment room	1,170	
(c) Addition to the existing building	600	
(3) Other structure, hardened guard station with CCTV, vehicle traffic, control barrier	215	
(4) Special facilities equipment		
(a) Accelerator and accessories	3,155	
(b) Equipment installation/design	320	
(5) Utilities	135	
c. Standard equipment includes bridge cranes, UPS, film processor, furnishings		575
Subtotal		\$ 8,785
d. Contingency at approximately 19% of above costs		1,715
Total estimated cost		\$10,500

11. Method of performance

Facility design and inspection will be performed under a negotiated architect-engineer contract. Construction and procurement will be accomplished by fixed-price contracts awarded on the basis of competitive bidding. Equipment specifications and installation design will be provided by the laboratory.

a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Test devices assembly building,
Los Alamos National Laboratory, Los Alamos, New Mexico

2. Project No.: 85-D-104

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	Total
a. Total project funding						
(1) Total facility costs						
(a) Construction line item	\$ 0	\$ 600	\$3,100	\$3,900	\$2,900	\$10,500
(b) CP&D	0	0	0	0	0	0
(c) Expense-funded equipment	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0
Total facility costs	\$ 0	\$ 600	\$3,100	\$3,900	\$2,900	\$10,500
(2) Other project funding						
(a) Conceptual design	\$ 240	\$ 0	\$ 0	\$ 0	\$ 0	\$ 240
(b) Other project-related costs	0	0	0	0	0	0
Total other project funding	\$ 240	\$ 0	\$ 0	\$ 0	\$ 0	\$ 240
Total project funding (items 1 and 2)	\$ 240	\$ 600	\$3,100	\$3,900	\$2,900	\$10,740
b. Total related funding requirements (estimated life of project: 25 years)						
(1) Facility operating costs						\$ 130
(2) Programmatic operating expenses directly related to the facility						0
(3) Capital equipment unrelated to construction but related to the programmatic effort in the facility						0
(4) GPP or other construction related to programmatic effort in the facility						0
(5) Other costs						0
Total other related annual funding requirements						\$ 130

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
- (1) Other project funding
- (a) The amount shown is for conceptual design and related costs for the last several years. No research and development is necessary for this project.
- (b) Other project-related costs are not anticipated.
- b. Total related funding requirements

The estimates for the average annual costs by category are based on past history of costs within this program and projected to the initial year of operation in these facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Test devices assembly building, Los Alamos National Laboratory, Los Alamos, New Mexico	2. Project No.: 85-D-104
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13. Narrative explanation of total project funding and other related funding requirements (contd.)

(1) Facility operating costs

The annual facility operating costs are estimated for FY 1988 as follows: 7,500 square feet at \$16.88/square foot (based on the laboratory average of \$1.57 for janitorial, \$1.92 for maintenance services, and \$4.23 for utilities in FY 1982, escalated 15 percent, 15 percent, and 13 percent per annum, respectively).

(2) Programmatic operating expenses directly related to the facility

Operating expenses directly related to this facility are direct labor, material, supplies, and related overhead. No new employees are anticipated to be required to operate this facility.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars)

1. Title and location of project: Combined device assembly facility,
Nevada Test Site, Nevada	2. Project No.: 85-D-105
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 4th Qtr. FY 1985	6. Current cost estimate: \$57,500
Date: 1/84
4. Date construction ends: 2nd Qtr. FY 1989	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 3,000	\$ 3,000	\$ 3,000	\$ 1,200
1986	25,000	25,000	25,000	11,800
1987	25,000	25,000	25,000	20,000
1988	4,500	4,500	4,500	17,500
1989	0	0	0	7,000

8. Brief physical description of project

This project provides for the consolidation of the Nevada Test Site (NTS), Los Alamos National Laboratory (LANL), and Lawrence Livermore National Laboratory (LLNL) assembly areas into one enhanced security area. The overall effort includes construction of new facilities that meet the Department of Energy (DOE) safety requirements as well as security additions that preclude the opportunity for an adversary to get "hands on" nuclear material. The major operational facilities required consist of four "Gravel Gertie" assembly structures, two radiography facilities, three high bay areas, three assembly areas/bunkers and one storage area, seven special nuclear material/high explosive (SNM/HE) storage bunkers (various sizes), two laboratory support buildings for storage and administrative offices, and one centrifuge apparatus building, one common-use machine shop, and one contractor maintenance support building. All of these structures, with the exception of the machine shop, maintenance support building, and the storage building, will be constructed of reinforced concrete, earth-bermed, and will be capable of meeting DOE containment criteria. The shop, maintenance building, and storage building will be preengineered metal building construction. The proposed complex is comprised of operational, administrative, and support facilities with approximately 109,000 square feet of floor space.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Combined device assembly facility,
Nevada Test Site, Nevada

2. Project No.: 85-D-105

8. Brief physical description of project (contd.)

The security requirements of the facilities include two elevated hardened guard towers; one hardened guard station; and 5,000 linear feet of 8-foot-high parallel perimeter fences 30 feet apart that encapsulate perimeter security alarms, lighting, and assessment CCTV. In addition, all bays, bunkers, and rooms that house SNM will have interior security alarms, assessment CCTV, and access denial systems.

Improvements to land consist of site and perimeter grading, drainage diversion, and road work. Utility construction will include water, sewer, electrical, and power to support the above facilities. Standard equipment will include two radiography machines, miscellaneous numerically controlled (NC) shop tools, overhead cranes, standard office furnishings, and laboratory-provided equipment.

Each 34-foot-diameter Gravel Gertie provides 1,017 square feet of work space. The circular structure has one-foot-thick reinforced concrete walls and a catenary roof structure composed of well-graded gravel 25 feet thick. The entire facility is earth-bermed and provides total containment in the event of up to a 500 pound HE explosion. Gravel Gertie support structures include mechanical equipment rooms and air-locked access vestibules. Each radiography facility consists of one equipment bay, air-locked access vestibules, x-ray viewing room, a supply storage room, and mechanical and electrical equipment rooms totaling 8,800 square feet. Each of the three high bays are 1,800 square feet with 25-foot ceilings. The four assembly/storage areas provide 840 square feet of work space and require 835 square feet of air-locked entryways. The ceiling height is 20 feet and is of the same frangible construction as that of the high bays. Three of the SNM/HE storage bunkers are 1,800 square feet; two are 900 square feet, and three are 600 square feet. The three large bunkers have ceiling heights of 25 feet; the five smaller bunkers have heights of 15 feet. The centrifuge building is 864 square feet with a height of 12 feet. The administrative support building for the laboratories is approximately 10,200 square feet. The common-use machine shop will be a preengineered metal building of 4,800 square feet. The contractor maintenance support building and lunch room are both preengineered metal buildings, providing a gross square footage of 4,600 square feet. All facilities will be fire-alarmed and fire-sprinkled in accordance with DOE fire safety specifications. All facilities will be provided with radiological floor drains tied to an isolated sump and decontamination facility.

The elevated hardened guard towers are 51 feet high and provide an observation cab, three levels of gun ports, one floor of security monitoring equipment, and one floor of utility support equipment. The six levels provide a total of 720 square feet of floor space. The hardened guard station is constructed of 6-inch reinforced concrete walls and roof with bullet-resistant metal doors and bullet-resistant glass windows. Gross square footage of this facility is 144 square feet.

The perimeter security alarms include 5,000 linear feet of ported coaxial movement-sensing cable and sufficient microwave-type movement detection equipment to cover the 5,000-linear-foot perimeter. The perimeter will also be equipped with assessment CCTV and lighting sufficient to provide a minimum of one foot candle at ground level. All Gravel Gerties, high bays, assembly bays, SNM storage bunkers, and radiography machine bays will be provided with motion detection-type CCTV and entry door alarms. All air-locked entry vestibules will be provided with access denial. Alarm readout displays will be installed in the elevated guard towers and the hardened guard station. The entire facility will be ringed with an aircraft early detection system.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Combined device assembly facility,
Nevada Test Site, Nevada

2. Project No.: 85-D-105

8. Brief physical description of project (contd.)

Improvements to land consist of approximately 160,000 square yards of site grading and drainage diversion, 10,000 linear feet of 8-foot-high security-type fencing, 11,000 square yards of paved roadway and parking areas within the compound, and 1 mile of 26-foot-wide paved access road. Utilities include 1 mile of 34.5 KV power transmission lines, 15,000 linear feet of 10-inch water line, one 500,000-gallon water storage tank and associated pumping equipment, and a self-supporting sewage collection and treatment system.

The requested FY 1985 funding will be used to initiate design and to start site preparation work.

9. Purpose, justification of need for, and scope of project

Two device assembly and storage facilities, one for LLNL and one for LANL, have historically been used at the NTS. An initial effort has been undertaken to move the LANL operation to the LLNL assembly area to create a consolidated facility. However, this is only an interim measure. The final solution will require the construction of a new, combined facility.

The new combined facility will be located significantly into the Test Site to preclude quick access by an adversary. The interim facility is located in very rough terrain, making security surveillance, target identification, and fire control very difficult. The new facility will be located in an open area with one-half to three-fourths of a mile of flat terrain in all directions. The existing facilities cannot be modified to meet DOE safety requirements. The new hardened buildings will be constructed at the new location, incorporating both hardening and a Gravel Gertie-type construction to prevent dispersion of nuclear material should an explosion occur. The new facilities will meet DOE safety and safeguards and security requirements. The interim facility has numerous operational deficiencies because the facilities assigned to LANL were formerly the backup facilities for LLNL. The new facility will have adequate backup capability for both laboratories and will incorporate measurement facilities which will be shared. The existing facilities for both laboratories contain significant obsolete equipment which will require replacement in the near term. This equipment will be replaced in the new facility.

The new facility has been designed with security as its primary feature. The basic features of location, terrain, and hardened construction are essential to retaining a secure posture as the threats evolve even more severe than those currently postulated.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Combined device assembly facility,
Nevada Test Site, Nevada

2. Project No.: 85-D-105

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 12% of construction costs, Item b		\$ 4,500
b. Construction costs		37,800
(1) Improvements to land, including grading, drainage, diversion, paving, fencing, and landscaping	\$ 1,600	
(2) Buildings and security facilities		
(a) Machine shop/conference room building (1 each)	200	
(b) Administrative support building (1 each)	300	
(c) Storage building (1 each)	100	
(d) SNM/HE storage bunkers (7 each)	2,600	
(e) LLNL/LANL assembly structures (includes four Gravel Gerties, two radiography facilities, three high bays, and four assembly areas)	20,300	
(f) Centrifuge building (1 each)	700	
(g) Hardened elevated guard towers (2 each)	800	
(h) Hardened guard station (1 each)	100	
(i) Security construction	3,100	
(3) Utilities, including electrical power, water, and sanitary sewerage lines	8,000	
c. Standard equipment		5,600
Subtotal		\$47,900
d. Contingency at approximately 20 percent of above costs		9,600
Total estimated cost		\$57,500

11. Method of performance

Design and inspection will be performed by operating contractors. Construction and procurement will primarily be by fixed-price contracts awarded on the basis of competitive bids. However, some portion of the construction and procurement will be performed by the operating contractor.

a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Combined device assembly facility,
Nevada Test Site, Nevada

2. Project No.: 85-D-105

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>Total</u>
a. Total project funding							
1. Total facility costs							
(a) Construction line item	\$ 0	\$1,200	\$11,800	\$20,000	\$17,500	\$7,000	\$57,500
Total facility cost	\$ 0	\$1,200	\$11,800	\$20,000	\$17,500	\$7,000	\$57,500
2. Other project funding							
(a) Conceptual design	\$ 300	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 300
Total other project funding	\$ 300	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 300
Total project funding (Items 1 and 2)	\$ 300	\$1,200	\$11,800	\$20,000	\$17,500	\$7,000	\$57,800
b. Other related funding requirements (estimated life of project: 30 years)							
1. Facility operating costs							\$ 400
2. Programmatic operating expenses directly related to the facilities							5,500
3. Capital equipment not related to construction but related to the programmatic effort in the facility							200
4. GPP or other construction related to programmatic effort in the facility							0
5. Other costs							0
Total other related annual funding requirements							\$ 6,100

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design

The cost of the conceptual design prepared for this project is approximately \$300,000.

b. Other related funding requirements

It is estimated that the programmatic life of these facilities will be 30 years.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Combined device assembly facility,
Nevada Test Site, Nevada

2. Project No.: 85-D-105

13. Narrative explanation of total project funding and related funding requirements (contd.)

1. Facility operating costs

Annual facility operating costs, estimated at \$400,000, will cover the cost of maintenance and utilities.

2. Programmatic operating costs

Annual programmatic operating expenses directly related to the facility cost to support users is estimated at \$5,500,000.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Hardened radiography facility, Site 300,
Lawrence Livermore National Laboratory,
Livermore, California

2. Project No.: 85-D-106

3. Date A-E work initiated: 1st Qtr. FY 1985

5. Previous cost estimate: None
Date:

3a. Date physical construction starts: 1st Qtr. FY 1986

6. Current cost estimate: \$4,800
Date: 1/84

4. Date construction ends: 2nd Qtr. FY 1987

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
66	1985	\$ 800	\$ 800	\$ 800	\$ 400
	1986	4,000	4,000	4,000	2,300
	1987	0	0	0	2,100

8. Brief physical description of project

This project will provide a new 6,600 square-foot radiography facility at Site 300, including a 5,200 square-foot hardened and shielded concrete cell area with two bridge cranes and housing a new 9 MeV x-ray source; a 1,400 square-foot laboratory/office area, which will adjoin an existing small control building, and will include a control area, an office area, equipment storage area, equipment rooms for the x-ray units, building mechanical equipment, and other supporting areas. The new facility will have an earthen cover on three sides and the top.

An existing metal building currently being used for high energy x-ray radiography will be removed and the existing site and utilities will be reused to the extent possible for the new facility. Land improvements will include a new parking area and minimal landscaping. Fire sprinkler systems, as well as other safety devices, will be installed. Normal building heating and cooling will be provided with special regard to energy conservation.

The requested FY 1985 funding will be used for design and procurement of long-lead equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Hardened radiography facility, Site 300, Lawrence Livermore National Laboratory, Livermore, California	2. Project No.: 85-D-106
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9. Purpose, justification of need for, and scope of project

High energy radiography capability is required at Site 300 to meet the diagnostic needs of the weapons program testing at Lawrence Livermore National Laboratory (LLNL). The facility must be capable of handling full warhead assemblies before and after dynamic and thermal testing sequences and also upon the receiving and shipping of the units. To satisfy the safeguards and security considerations, the facility will be hardened and will have a detection system.

The threat spectrum considered for LLNL, including Site 300, ranges from political demonstrators who are relatively peaceful but may intrude into the laboratory to gain media attention and cause disruption to antinuclear extremists and terrorists who intend to sabotage facilities and/or engage in the theft of special nuclear materials (SNM). Also factored into the considerations are the threats posed by disgruntled employees who may act alone or in collusion with other employees and/or external adversaries for the purpose of espionage or sabotage.

100 An effective safeguards and security system is an aggregation of the protective mechanisms which contribute to the reduction of risks from the actions of an adversary. The principal objectives are to reduce the frequency of adversary actions through deterrence and, if such actions were attempted, reduce the probability of success by timely interdiction/interruption.

An upgraded and expanded detection/alarm system with interactive capability will provide the laboratory's security department with a reliable system that allows immediate notification and coordinated control of all surveillance alarms and alarmed facilities in which classified parts, information, and SNM are stored. The proposed system will provide an enhanced identification system and increased computer surveillance capabilities.

This project will augment the existing obsolete 13 MeV facility and meet the diagnostic needs to carry out high energy radiography tests involving high explosives and SNM in support of the weapons program's long-term goals at LLNL. The existing facility which is located in a preengineered metal building cannot be economically upgraded to satisfy programmatic requirements.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Hardened radiography facility, Site 300,
Lawrence Livermore National Laboratory,
Livermore, California

2. Project No.: 85-D-106

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at about 18% of construction costs, Item b		\$ 450
b. Construction costs		2,500
(1) Improvements to land, including grading, paving, walks, and landscaping	\$ 100	
(2) Buildings		
(a) Hardened/shielded facility, approx. 5,200 sq.ft. at approx. \$406/sq.ft.	2,110	
(b) Lab/office facility, approx. 1,400 sq.ft. at approx. \$136/sq.ft.	190	
(3) Utilities, including mechanical utilities, sanitary and storm sewers, electrical power, communications, and area lighting	100	
c. Standard equipment		1,000
d. Removal cost, less salvage		100
Subtotal		4,050
e. Contingency at approximately 18% of above costs		750
Total estimated cost		\$4,800

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11. Method of performance

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

12. Funding schedule of project funding and other related funding requirements

Not required.

13. Narrative explanation of total project funding and related funding requirements

Not required.

a/ Based upon completed conceptual design.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Radiation-hardened integrated circuit laboratory,
Sandia National Laboratories (SNL), Albuquerque, New Mexico	2. Project No.: 84-D-102
3. Date A-E work initiated: 2nd Qtr. FY 1984	5. Previous Cost Estimate: None
Date:
3a. Date physical construction starts: 2nd Qtr. FY 1985	6. Current cost estimate: \$40,500
Date: 1/84
4. Date construction ends: 2nd Qtr. FY 1987	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
100	1984	\$ 2,000	\$ 2,000	\$ 2,000	\$ 700
	1985	20,000	20,000	20,000	7,300
	1986	15,500	15,500	15,500	17,800
	1987	3,000	3,000	3,000	14,700

8. Brief physical description of project

This project provides for the construction of a two-story and basement laboratory building of approximately 143,000 square feet gross area and a water chiller plant of about 6,000 square feet gross area. The laboratory building will have 32,000 square feet of heavy laboratory of which 12,000 square feet will be a completely flexible class 20 at 0.12 microns clean room area. Within this class 20 clean room, local regions will be operated at class 1 cleanliness level. In these regions, vibration must be minimized, and both temperature and humidity will be precisely controlled (+ 1/2° fahrenheit, + 2.5 percent relative humidity). The basement (49,000 square feet) will be primarily an equipment area, and the balance of the building, about 62,000 square feet gross, will be light laboratory offices, restrooms, and corridors to support the Sandia radiation-hardened integrated circuit laboratory.

The FY 1985 funding requested provides for initiating construction of the new building and procurement of the process equipment.

9. Purpose, justification of need for, and scope of project

In 1974, SNL and the Department of Energy (DOE) decided to build the present radiation-hardened integrated circuit laboratory by modifying and adding on to existing buildings, both to develop new radiation-hardened integrated circuit designs and

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Radiation-hardened integrated circuit laboratory,
Sandia National Laboratories (SNL), Albuquerque, New Mexico

2. Project No.: 84-D-102

9. Purpose, justification of need for, and scope of project (contd.)

technology and to provide a backup production source in the event the American semiconductor industry could not satisfy DOE production needs.

This facility has been very successful in allowing Sandia systems to utilize the latest large-scale integration (LSI) circuits in weapon systems designs. The W78, W81, W82, B83, W84, and B61-7, -8 all utilize integrated circuits (IC's) which are designed and produced by the Sandia radiation-hardened integrated circuit laboratory. Although industry is supplying some of the LSI needs on these programs, there are several cases where Sandia laboratories is either the sole source or the planned source for a major fraction of the production because American industry cannot produce these complex, radiation-hardened parts. Work continues to transfer production to industry where possible, but it is recognized that in-house production is essential to allow weapon systems to make effective use of LSI.

The component deliveries from the Sandia facility have increased rapidly. In 1980, only a few hundred units were supplied to the Bendix Plant in Kansas City, Missouri. In 1981, approximately 5,000 good chips and packaged IC's were provided to the Bendix Plant. The 1982 orders exceeded 60,000 units. The present LSI clean room facility will be required to support DOE LSI production requirements for the next decade, and the responsibility for operating this facility is currently being transferred to the Bendix Plant.

The present facility at SNL is marginally adequate to meet these needs for the next five years. Where inadequacies surface, they can be addressed by modifying or supplementing present facilities. However, the next generation very large-scale integrated (VLSI) technologies, which will be required by Sandia systems, place demands which present facilities cannot meet--space, quality, and quantity. It is clear that VLSI technology, if available with adequate reliability and radiation-hardness, offers one key to improve weapon performance, command and control, and safety and security through increased weapon "intelligence."

The proposed radiation-hardened integrated circuit laboratory provides for a VLSI-quality clean room designed to match the requirements of the 1990's technologies we will be needing. In this facility, the vibration level, air and water cleanliness, humidity, and temperature must be controlled to a greater degree than is possible in the present facility.

Success in VLSI circuits also requires a greater degree of interaction between designer, technologist, and fabricator than required by present LSI, since VLSI circuits work closer to basic material and device limits. Thus, the new building has been designed to pull together into a single building much of the VLSI staff.

Without this new facility, it will be virtually impossible for DOE to develop and utilize radiation-hardened VLSI in systems of the 1990's.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Radiation-hardened integrated circuit laboratory,
Sandia National Laboratories (SNL), Albuquerque, New Mexico

2. Project No.: 84-D-102

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at about 11% of construction costs, item b		\$ 2,000
b. Construction costs		18,150
(1) Improvements to land, including grading, excavations, landscaping, paving, and roads	\$ 250	
(2) Building - approximately 143,000 square feet at about \$107 per square foot	15,250	
(3) Utilities	2,650	
c. Standard equipment		14,850
(1) New equipment (lithography, etching, implantation, etc.)	12,850	
(2) Relocate existing equipment	2,000	
	Subtotal	35,000
d. Contingency at approximately 16% of above costs		5,500
	Total estimated cost ..	\$40,500

11. Method of performance

Building design and inspection will be performed under a negotiated architect-engineer contract. Equipment design will be performed by SNL personnel. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 700	\$ 7,300	\$17,800	\$14,700	\$40,500
Total facility costs	700	7,300	17,800	14,700	40,500
2. Other project funding					
(a) Conceptual design costs	\$ 30	0	0	0	30
Total other project funding	\$ 30	0	0	0	30
Total project funding					
(items 1 and 2)	\$ 730	\$ 7,300	\$17,800	\$14,700	\$40,530

a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Radiation-hardened integrated circuit laboratory,
Sandia National Laboratories (SNL), Albuquerque, New Mexico

2. Project No.: 84-D-102

12. Funding schedule of project funding and other related funding requirements (contd.)

b. Other related funding requirements (estimated life of project: 50 years)

1. Facility operating costs	\$ 500
2. Programmatic operating expenses directly related to the facility	25,000
Total other related annual funding requirements	\$25,500

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design \$ 30

The amount shown is for conceptual design.

b. Other related funding requirements

1. Facility operating costs \$ 500

Costs of unrecoverable materials and expenses used during operating and maintenance activities.
Includes chemicals, gases, lubricants, waste disposal, and maintenance of steam and condensate lines.

2. Programmatic operating expenses directly related to the facility \$25,000

The operation and maintenance staff requirements including approximately 250 persons at \$100,000/year/person.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Hardened central guard force facility,
Los Alamos National Laboratory,
Los Alamos, New Mexico	2. Project No.: 84-D-103
3. Date A-E work initiated: 2nd Qtr. FY 1984	5. Previous cost estimate: \$6,600
Date: 1/83
3a. Date physical construction starts: 1st Qtr. FY 1985	6. Current cost estimate: \$6,200
Date: 1/84
4. Date construction ends: 3rd Qtr. FY 1986	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1984	\$ 600	\$ 600	\$ 600	\$ 180
1985	5,600	5,600	5,600	2,800
1986	0	0	0	3,220

8. Brief physical description of project

The hardened central guard force building will be a partially buried structure of approximately 13,000 square feet housing a hardened facility environment with the capability of withstanding a light weapons fire attack while maintaining the communications, armory, and vault support functions necessary to coordinate other security resources as needed. The functions to be housed will be: a three-vehicle garage and maintenance room; a mechanical equipment room; an emergency electrical room; a radiological support space; an armory with a vault; a communication and dispatch room; a computer room; a ready room with kitchen and storage; a briefing room; offices; a men's change room, showers, and restroom for 200 men; a women's change room, showers, and restroom for 30 women; and a physical conditioning room.

Land improvements and other structures will include improvements to a nearby road intersection, a paved access road, hardened guard station, paved parking for approximately 130 private vehicles outside the fence and 40 official vehicles inside the fence, curb and gutter, and sidewalks. Southwestern-style landscaping will be provided to replace vegetation destroyed during construction.

The FY 1985 funding requested provides for completion of these facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Hardened central guard force facility,
Los Alamos National Laboratory,
Los Alamos, New Mexico

2. Project No.: 84-D-103

9. Purpose, justification of need for, and scope of project

The current political environment of ever-growing terrorist activities and the increasing threat of diversion of special nuclear materials (SNM), classified material, and other information for political, terrorist, or blackmail reasons make improved security protection essential for nuclear devices, components, weapons assemblies, classified information, significant quantities of SNM, other radioactive material, and physical plant security.

The laboratory has geographical features that are unique as compared to other comparable installations. The overall site contains more than 43 square miles of land area with over 150 miles of improved roads. In addition, the geography is composed of canyons ranging several hundred feet in depth, with parallel plateaus and rugged terrain. The elevations of the site range from 6,000 feet to over 7,300 feet mean sea level.

The existing guard facilities are located in temporary buildings which are not hardened.

One of the chief objectives in the protection of the facilities within the laboratory is to continue improving the ability to coordinate an action within a minimum of time to respond to any unauthorized intrusion, for whatever purpose. Accordingly, the requested facility would be located on a site near the plutonium reprocessing facility and the pulse reactor facility along the road that connects many other sensitive facilities. Its purpose would be to contain critical security functions in a hardened environment. This facility is needed to: reduce the response time to the majority of the sensitive facilities; and enhance the ability to protect the laboratory, its communications systems, and other vital functions.

The reduction in the total estimated cost reflects adjustments made to current lower than anticipated inflation rates for construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Hardened central guard force facility,
Los Alamos National Laboratory,
Los Alamos, New Mexico

2. Project No.: 84-D-103

10. Details of cost estimate a/

Item cost Total cost

a. Engineering, design, and inspection at about 16% of construction costs		\$ 640
b. Construction costs		4,000
(1) Improvements to land	\$ 600	
(2) Building - central guard force facility 13,000 square feet at about \$173 per square foot	2,250	
(3) Other structures - hardened guard station	170	
(4) Utilities	700	
(5) Special facilities, including security detection and alarm systems	280	
c. Standard equipment		560
	Subtotal	5,200
d. Contingencies at approximately 19% of above costs		1,000
	Total estimated cost	\$6,200

11. Method of performance

Design and inspection of the facility will be accomplished by negotiated architect-engineer contract. Construction will be accomplished by fixed-price contracts awarded on the basis of competitive bids.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item	\$ 180	\$ 2,800	\$ 3,220	\$ 6,200
Total facility costs	180	2,800	3,220	6,200
2. Other project funding				
(a) Conceptual design	55	0	0	55
Total other project funding	55	0	0	55
Total project funding (items 1 and 2)	\$ 235	\$ 2,800	\$ 3,220	\$ 6,255

a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Hardened central guard force facility, Los Alamos National Laboratory, Los Alamos, New Mexico	2. Project No.: 84-D-103
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12. Funding schedule of project funding and other related funding requirements (contd.)

- b. Other related funding requirements (estimated life of project: 50 years)
 - 1. Facility operating costs \$ 134
 - 2. Programmatic operating expenses directly related to these facilities 630
 - 3. Capital equipment not related to construction but related to the programmatic effort in the facility 1,400
 - Total other related funding requirements \$ 2,164

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other related project costs

(a) Conceptual design costs

Costs included in this category are those necessary to develop a budget quality cost estimate and construction schedule.

b. Other related funding requirements

The estimated life of the facilities provided by this project is 50 years.

1. Facility operating costs

This category includes maintenance, janitorial, and utilities from FY 1981 costs calculated on a per-square-foot basis throughout LANL and projected to FY 1985. An 11 percent escalation per year was used on maintenance and janitorial base costs and 15 percent per year was used on utility base costs.

2. Programmatic operating costs

This cost figure was obtained as a product of 12 full-time equivalents (FTE's) scheduled for FY 1985 operating in this facility and the loaded cost per FTE (salary, overhead, material, and supplies) projected to FY 1985, using an escalation of 15 percent per year. The protective force or security personnel are assigned to outlying sites and not included in the direct operating expenses of this facility. All other operating equipment is existing and will be relocated to the new facility.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Hardened central guard force facility,
Los Alamos National Laboratory,
Los Alamos, New Mexico

2. Project No.: 84-D-103

13. Narrative explanation of total project funding and other related funding requirements (contd.)

3. Capital equipment not related to construction

The amount shown is based on past operating history and anticipated requirements for new capital equipment for this program.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Nuclear materials storage facility, Los Alamos
National Laboratory, Los Alamos, New Mexico	2. Project No.: 84-D-104
3. Date A-E work initiated: 2nd Qtr. FY 1984	5. Previous cost estimate: \$20,000
Date: 1/83
3a. Date physical construction starts: 3rd Qtr. FY 1985	6. Current cost estimate: \$19,300
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1987	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1984	\$ 700	\$ 700	\$ 700	\$ 200
1985	6,500	6,500	6,500	2,500
1986	12,100	12,100	12,100	8,700
1987	0	0	0	7,900

8. Brief physical description of project

This project provides for the construction of a repository for long and intermediate storage of large quantities of source and special nuclear materials (SNM). It will be designed to meet security, safety, and safeguards requirements for the storage and handling of nuclear materials. The new 29,100-square-foot building will contain a vault area of approximately 13,000 square feet. In addition to the nuclear materials storage vault, the facility support area will contain a secure shipping/receiving area, safe/secure transport (SST) vehicle garage and dock, equipment space, offices, toilet/change rooms, general "cold" storage area, a date distribution room, a freight elevator, a transfer tunnel to connect the new facility with the existing facility, and other special features required of a facility used for storing and handling large quantities of nuclear materials.

Natural gas-fired hot water boilers for space heating will be provided, and summer temperature control will be provided for the storage vault area, shipping/receiving, and computer equipment by mechanical refrigeration. Mechanical ventilation will be provided for the general storage, SST garage, offices, toilet/change rooms, and equipment room. In addition to normal electrical service, an emergency bus will supply the ventilation system and an uninterruptable power supply for alarms and emergency lighting systems. The building will be equipped with a telephone system, a protected wireline system, a radiation monitoring system, and an intrusion detection system. Fire protection will be provided by a hydraulically designed wet pipe sprinkler

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear materials storage facility, Los Alamos National Laboratory, Los Alamos, New Mexico	2. Project No.: 84-D-104
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8. Brief physical description of project (contd.)

system in the support areas and an independent automatic preaction sprinkler system in the storage vault area. The vault area preaction system will be actuated by an early warning detection system.

Special shielding will be built into the cells in the vault to minimize radiation exposure to employees working at the facility. The facility will be connected to the existing plutonium (Pu) processing building just north of the proposed site by an 8-foot-wide tunnel. The tunnel will be used for transferring nuclear materials between the new facility and the Pu processing facility. There will be vault doors at each end of the tunnel to ensure that physical protection requirements are met. The facility will also have an exhausted enclosure located in the shipping/receiving area for opening shipping containers received from offsite in order to minimize potential contamination associated with the unpacking of nuclear material shipments. Exhaust from this enclosure and the storage vault area will be discharged via absolute filtration and a stack.

To provide for physical security and to minimize public exposure to the SNM park, a portion of an existing road must be rerouted. Included is approximately one mile of a two-lane arterial paved highway including transitions, connections, and intersection relocations. Site work will include parking for about six government vehicles, curbs and service road, landscaping, drainage, and erosion control.

The FY 1985 funding requested provides for Title II design of these facilities, rerouting the existing road, preparation of the building site, and bringing the utilities to the site.

9. Purpose, justification of need for, and scope of project

The facility will provide needed secured and safeguarded storage and transfer facilities for SNM entering and leaving the laboratory. This facility is needed to accommodate the increasing recovery and storage demands being placed on LANL by the agency. The Pu storage vault in the Pu processing facility at LANL is now filled to capacity. This storage vault was designed only as a medium capacity working inventory vault. Currently, the Pu storage vault is congested with long-term nuclear materials storage and nuclear material encased in shipping containers. The Pu processing complex was not designed to handle SST movements of material. Currently none of the laboratory storage facilities outside of the Pu facility meet the criteria for a regularly accessed nuclear materials storage facility. The proposed storage facility will have enough storage space to accommodate the decommissioning of many of these inadequate storage facilities and will effect significant safeguards and security improvements.

The garage area for two SSTs will permit the transshipment of SNM for the agency, a function currently performed in an uncovered area. The purpose of the covered area is for weather protection and to shield the activity from outside view of uncleared persons. A special heating, ventilating, and air-conditioning system will be required so that specified air pressure levels throughout the facility can be maintained to prevent the spread of contamination in case of an accidental spill or release of material within the facility. The ventilation system will require absolute filters on the exhaust air to prevent the release of hazardous material to the outside environment in case of accidental spills or releases.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear materials storage facility, Los Alamos National Laboratory, Los Alamos, New Mexico

2. Project No.: 84-D-104

9. Purpose, justification of need for, and scope of project (contd.)

Current laboratory storage for enriched uranium and other nuclear materials is also at or near the maximum usage. To maintain combination storage for these materials, the laboratory has had to store its nuclear materials at widely separated locations. This necessitates numerous moves of large quantities of special and other nuclear material over public access roads. The proposed siting will provide for the movement of SNM within the Pu complex to be accomplished underground, greatly enhancing the security level within the total complex.

The reduction in the total estimated cost reflects adjustments made to current lower than anticipated inflation rates for construction.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at about 16% of construction costs, item b		\$ 2,200
b. Construction costs		14,000
(1) Improvements to land, including grading, excavations, landscaping, paving, road relocation, and fencing	\$ 1,370	
(2) Buildings		
(a) Nuclear materials storage area and shipping/receiving, approximately 15,600 square feet at approximately \$475 per square foot	7,410	
(b) Support area, including truck garage, offices, toilet/change rooms, general storage, and equipment room, approximately 13,500 square feet at approximately \$94 per square foot	1,270	
(c) Material transfer tunnel, approximately 4,000 square feet at approximately \$187 per square foot	750	
(3) Utilities, including electrical power, fire protection and domestic water, natural gas, sanitary sewer, and communications lines	3,200	
c. Standard equipment		100
	Subtotal	\$16,300
d. Contingency at approximately 18% of above costs		3,000
	Total estimated cost	\$19,300

11. Method of performance

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

a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear materials storage facility, Los Alamos National Laboratory, Los Alamos, New Mexico

2. Project No.: 84-D-104

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 200	\$ 2,500	\$ 8,700	\$ 7,900	\$ 19,300
Total facility costs	200	2,500	8,700	7,900	19,300
2. Other project funding					
(a) Conceptual design costs	180	0	0	0	180
Total other project funding	180	0	0	0	180
Total project funding					
(items 1 and 2	\$ 380	\$ 2,500	\$ 8,700	\$ 7,900	\$ 19,480

b. Other related funding requirements (estimated life of project: 25 years)	
1. Facility operating costs	\$ 550
2. Programmatic operating expenses directly related to the facility	880
Total other related costs	\$ 1,430

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
1. Other project funding
- (a) Conceptual design

The amount shown is for conceptual design.

- b. Other related funding requirements
1. Facility operating costs

The annual facility operating costs are estimated for FY 1987 as follows: 29,100 square feet at \$19.04 per square foot (based on the laboratory average of \$1.41 for janitorial, \$1.69 for maintenance services, and \$3.60 for utilities in FY 1981 escalated 15 percent, 15 percent, and 22 percent per annum, respectively).

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project:	Nuclear materials storage facility, Los Alamos National Laboratory, Los Alamos, New Mexico	2. Project No.:	84-D-104
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13. Narrative explanation of total project funding and other related funding requirements (contd.)

2. Programmatic operating expenses directly related to the facility

The annual cost of programmatic activities to be conducted in this facility is estimated at \$880,000 for the year FY 1987. This cost figure was calculated for six FTE's as follows: FY 1981 loaded costs (salary, overhead, material, and supplies) for two FTE's at \$55,000 per year and five FTE's at \$50,000 per year projected to FY 1987 using an escalation rate of 16 percent per annum.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars)

1. Title and location of project: Safeguards and security upgrades, Phase I,
Los Alamos National Laboratory, Los Alamos, New Mexico	2. Project No.: 84-D-105
3. Date A-E work initiated: 3rd Qtr. FY 1984	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 4th Qtr. FY 1984	6. Current cost estimate: \$15,100
Date: 1/84
4. Date construction ends: 1st Qtr. FY 1987	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
Proposed 1984 Supplemental	\$ 5,000	\$ 5,000	\$ 5,000	\$ 1,500
1985	10,100	10,100	10,100	7,500
1986	0	0	0	4,000
1987	0	0	0	2,100

8. Brief physical description of project

This project provides for increased security of classified material and special nuclear material (SNM) and physical plant security at the Los Alamos National Laboratory (LANL). This will be accomplished by new construction, equipment acquisition and installation, and upgrading existing facilities. The project, as currently defined, includes the following items:

a. Hardened vehicles

Vehicles are needed for: (1) intrasite shipments of weapons components, SNM Categories I and II, nuclear device assemblies, and nuclear explosive-like assemblies (NELA); (2) escort of those shipments in (1); and (3) patrol of sensitive areas.

b. Critical path facilities protection upgrades

There are many critical path support facilities located throughout the LANL complex. The disruption of the function of these facilities would cause a significant impact on the weapons program. Although there is currently no known method of fully neutralizing these threats, protection improvements can be achieved. These improvements include perimeter alarms, improved assessment capabilities, double fencing, related hardware/software, and hardened entry stations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security upgrades, Phase I, Los Alamos National Laboratory, Los Alamos, New Mexico 2. Project No.: 84-D-105

8. Brief physical description of project (contd.)

c. Special communications

This phase of procurement would begin the total transition to data encryption standard (DES) type equipment. In addition, it includes the hardware to make the material accountability security system (MASS) a secure system.

d. SNM areas backup power for alarms and perimeter lighting

The SNM areas need backup power for the alarms and perimeter lighting. The present method to accomplish this in some of the areas is the "loop" feed concept, which is basically unsatisfactory. This item would provide uninterruptible power supplies (UPS) and emergency generators for the perimeter lighting and alarms.

e. Upgrades

The upgrades include perimeter access controls for secure and nonsecure areas, improved security alarms, new video surveillance systems, basic rapid alarm security system (BRASS) upgrades, backup to BRASS systems (local and/or remote), firing range shelter, and other security support functions.

The requested FY 1984 funding will be used to initiate design, install fencing, and procure long-lead items. The FY 1985 funding will be used to complete the project.

9. Purpose, justification of need for, and scope of project

The current political environment of ever-growing terrorist activities, increased antinuclear demonstrations, and the greater threat of diversion of SNM and/or classified information for political, terrorist, embarrassment, or blackmail reasons makes improved protection essential for nuclear devices, components, weapons assemblies, classified information (including computing and telecommunications), significant quantities of SNM, and physical plant security. This encompasses the establishment of additional safeguards in areas where SNM is processed, inventoried, transported, used, or stored. LANL must consider all of the above possibilities. Therefore, the proposed safeguards will provide for upgraded (1) detection and neutralization of unauthorized entry(s), (2) countermeasures against attempts at removal, (3) detection of small losses of SNM that could be used for embarrassment actions in vulnerable areas, and (4) physical protection of sensitive areas and property.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security upgrades, Phase I,
Los Alamos National Laboratory, Los Alamos, New Mexico

2. Project No.: 84-D-105

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 9% of construction costs, item b		\$ 1,000
b. Construction costs		11,705
(1) Critical path facilities protection upgrades	\$ 4,140	
(2) SNM area backup power	600	
(3) Perimeter upgrades	5,160	
(4) Special items (vehicles and communications)	1,805	
c. Standard equipment		0
Subtotal		\$12,705
d. Contingency at approximately 19% of above costs		2,395
Total estimated cost		\$15,100

11. Method of performance

Designs and inspections will be internally performed as provided under a negotiated contract. Special facility equipment design and procurement will be performed by the operating contractor. Where possible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1984	FY 1985	FY 1986	FY 1987	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$ 0	\$1,500	\$ 7,500	\$ 4,000	\$2,100	\$15,100
Total facility cost	\$ 0	\$1,500	\$ 7,500	\$ 4,000	\$2,100	\$15,100
2. Other project funding						
(a) Conceptual design	\$ 25	\$ 0	\$ 0	\$ 0	\$ 0	\$ 25
Total other project funding	\$ 25	\$ 0	\$ 0	\$ 0	\$ 0	\$ 25
Total project funding (Items 1 and 2)	\$ 25	\$1,500	\$ 7,500	\$ 4,000	\$2,100	\$15,125

a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security upgrades, Phase I,
Los Alamos National Laboratory, Los Alamos, New Mexico

2. Project No.: 84-D-105

12. Funding schedule of project funding and other related funding requirements (contd.)

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

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design costs

The amount shown is for conceptual design that is necessary to establish the specific design and construction features.

b. Other related funding requirements

The project consists of portable and installed equipment only. Facility operating costs are not applicable. Maintenance will be performed with indirect funding.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars)

1. Title and location of project: Security system upgrade, Sandia National Laboratories, Albuquerque, New Mexico	2. Project No.: 84-D-106
3. Date A-E work initiated: 3rd Qtr. FY 1984	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 1st Qtr. FY 1985	6. Current cost estimate: \$ 3,800
Date: 1/84
4. Date construction ends: 2nd Qtr. FY 1986	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
Proposed 1984 Supplemental	\$ 1,500	\$ 1,500	\$ 1,500	\$ 800
1985	2,300	2,300	2,300	2,300
1986	0	0	0	700

8. Brief physical description of project

The Sandia Security System Upgrade is a project to modernize the current security system at Sandia National Laboratories, Albuquerque (SNLA).

This project will provide a new, state-of-the-art security system made up of two complete, but separate, subsystems which will replace the existing system in its entirety. The first will service Areas I, II, and IV, with the second system servicing Areas III, V, and the remote areas. This system will provide access control, alarm assessment, alarm reporting, control of individual sensors, and more. The system incorporates a new command center design for monitoring alarms, a new communications subsystem (i.e., a local area network (LAN)), and distributed processing that includes data concentration and multiplexing.

The design as conceived will allow for staged implementation and installation. The activity will first upgrade the system operating in Areas I/II/IV and then upgrade Areas III/V. The first stage of implementation will include the installation of the computing equipment, the broad-band LAN cable, network interface units, a data concentrator pair, and multiplexors in one major building. The second stage will be the completion of the final system for Areas I/II/IV. The third stage of the implementation will be the installation of the second system for Areas III/V. This system will be similar to the first system except for the communication link. Modems and telephone pairs will be used instead of the broad-band LAN cable and network interface units. The cable is not economically feasible in the remote areas because of the long distances and mountainous terrain involved.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Security system upgrade, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 84-D-106

8. Brief physical description of project (contd.)

The FY 1984 funds will be used to initiate design and procurement of long-lead equipment. The FY 1985 funds will be used to complete the project.

9. Purpose, justification of need for, and scope of project

SNLA occupies some 2,870 acres of land situated on Kirtland Air Force Base and is divided into five major technical areas plus a number of remote test sites which are located in undeveloped and mountainous terrain covering an estimated area in excess of 50 square miles.

Area I, situated on a 100-acre plot, is the primary area of the laboratories and consists of some 100 buildings housing the majority of the technical and administrative staff, various laboratories, test facilities, fabrication and assembly areas, and other support functions. This area contains large volumes of classified information and material and small quantities of nuclear and radioactive materials.

Area II is a remote area covering 300 acres and containing approximately 40 buildings and storage igloos which house the technical staff and facilities for testing and storing explosive devices. This area also contains classified information and material.

Area III, comprising 1,900 acres, is a remote environmental test area and includes some 50 buildings which house the technical staff and numerous test facilities which are unique to the development testing of nuclear weapons.

Area IV, located on a 250-acre plot, consists of about a dozen buildings which house the research staff and facilities which are devoted to Particle Beam Fusion (PBF) research at Sandia. This is a classified area and contains equipment unique to PBF.

Area V contains Sandia's Reactor Facility and consists of some 15 buildings which house the research staff and the various reactors. This area covers 20 acres and contains large quantities of special nuclear materials and other radioactive materials.

The remote test areas contain various test facilities, along with their associated control buildings and equipment.

Security for the above areas is provided by the three systems.

The first system was designed and installed about 10 or 12 years ago and provides protection for Area I exclusively. This system uses outdated technology and is no longer supported by the manufacturer. Its limited capacity (i.e., 300 zones) has forced the grouping of large numbers of sensors on a single zone. In some instances, as many as 25 sensors are in series in a single zone. This makes the resolution of incoming alarms extremely difficult. This problem is further compounded by the fact that the underground cable used to feed the system does not reach all parts of the area, and overcrowded ducts preclude the introduction of new cabling. A new alarm system is urgently required in the near future in order to: (1) alarm any new

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Security system upgrade, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 84-D-106

9. Purpose, justification of need for, and scope of project (contd.)

buildings, including those currently under construction; (2) provide additional classified work areas; (3) provide classified computer sites; and (4) provide additional asset protection.

The second system was designed and installed about seven or eight years ago and has been a constant source of trouble. The system is no longer built by the manufacturer and they are now reluctant to provide support. This system provides protection for Areas II, III, IV, V (except for the SPR reactor), and the remote areas.

The third system, which was designed by Sandia, was installed as a development prototype system to test various access, assessment, and reporting concepts. The system works reasonably well, but is difficult to maintain because many of its component parts are one-of-a-kind. Since this system is used to protect a large quantity of special nuclear materials, it should be of the highest reliability. A new alarm system is required to assure providing the best possible protection for these particularly sensitive materials.

In summary, the above systems suffer from a combination of outdated technology, inadequate capacity, and numerous maintenance problems resulting from old age, one-of-a-kind hardware, lack of vendor support, and inadequate documentation.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at about 13% of construction costs, item b		\$ 80
b. Construction costs		600
(1) Building modifications	\$ 150	
(2) Utilities	450	
c. Standard equipment		2,620
	Subtotal	\$ 3,300
d. Contingency at approximately 15% of above costs		500
	Total estimated cost	\$ 3,800

a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Security system upgrade, Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 84-D-106

11. Method of performance

Design and inspection will be on the basis of a negotiated fixed-fee subcontract placed on the basis of competency. Construction and equipment procurement and installation will be by subcontracts awarded by competitive bids.

12. Funding schedule of project funding and other related funding requirements

	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>Total</u>
a. Total project funding				
1. Total facility costs				
(a) Construction line item	\$ 800	\$2,300	\$ 700	\$3,800
Total facility cost	\$ 800	\$2,300	\$ 700	\$3,800
2. Other project funding				
(a) Conceptual design	\$ 25	\$ 0	\$ 0	\$ 25
Total other project funding	\$ 25	\$ 0	\$ 0	\$ 25
Total project funding (Items 1 and 2)	\$ 825	\$2,300	\$ 700	\$3,825

b. Other related funding requirements (estimated life of project: 20 years)

1. Facility operating costs	\$ 250
2. Programmatic operating expenses directly related to the facility	300
3. Capital equipment not related to construction, but related to the programmatic effort in the facility	0
4. GPP or other construction related to programmatic effort in the facility	0
5. Other costs	0
Total other related annual funding requirements	\$ 550

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding

(a) Approximately \$25,000 was required to prepare a conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Security system upgrade, Sandia National Laboratories, Albuquerque, New Mexico	2. Project No.: 84-D-106
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13. Narrative explanation of total project funding and related funding requirements (contd.)

b. Other related funding requirements

1. Facility operating costs

Facility operating costs of \$250,000 are projected to cover the cost of maintenance and utilities for the project.

2. Programmatic operating expenses directly related to the facility

Programmatic operating costs estimated manpower cost to support this project.

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Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Nuclear testing facilities revitalization, various locations	2. Project No.: 84-D-107
3. Date A-E work initiated: 1st Qtr. FY 1984	5. Previous cost estimate: \$600,000
Date: 1/83
3a. Date physical construction starts: 2nd Qtr. FY 1984	6. Current cost estimate: \$75,200 <u>a/</u>
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1987	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
100	1984	\$23,500	\$23,500	\$23,500	\$19,800
	1985	34,900	34,900	34,900	38,600
	1986	16,800	16,800	16,800	9,000
	1987	0	0	0	7,800

8. Brief physical description of project

This project provides for the construction of new facilities; modifications, relocations, and additions to existing facilities; and new and replacement equipment for the revitalization of the nuclear weapons research, development, and testing (RD&T) facilities at the Los Alamos National Laboratory (LANL), the Lawrence Livermore National Laboratory (LLNL), the Nevada Test Site (NTS), and the North Las Vegas (NLV) ATLAS facilities. This project is a capital investment program to provide new or additional capabilities or capacities to the nuclear weapons testing complex. These new and modified facilities and equipment will replace or add to existing facilities that are overaged, deteriorated, overcrowded, or are inadequate to meet the capabilities required for the current and future weapons testing program and to achieve a long-term balanced test program and analysis of the materials and data obtained from such a test program. In addition to providing facilities and equipment in direct support of the testing program, this project also provides for necessary upgrades for environmental, safety, and health requirements; and safeguards and security requirements.

a/ This reduced total estimated cost (TEC) is based upon completing those test revitalization subprojects initiated in FY 1984. The balance of the original TEC and the scope of work has been included in the TEC of Project 85-D-102, Nuclear Weapons Research, Development, and Testing (RD&T) Facilities Revitalization, Various Locations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization,
various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

The following briefly identifies the purpose and justification for the subprojects to be funded in this project.

Nevada Test Site (NTS) and North Las Vegas (NLV) ATLAS Facility, Nevada

a. Field Engineering Complex, NLV, Nevada

(TEC \$33,100,000; FY 1984 funding \$1,300,000; FY 1985 funding \$15,000,000)

This subproject, which was initiated in FY 1984, will provide building space of 240,000 square feet and related utilities located on 30 acres of private land to be purchased adjacent to the NLV Facility. A paved parking area of 310,000 square feet for 900 vehicles and a paved staging area of 150,000 square feet for instrumentation trailers will be provided. This facility will house personnel involved in preevent staging and diagnostics activities and will provide management, administrative, technical, computer, warehousing, and general support space.

The need for this new facility primarily results from the expanded programmatic support needs of LANL, LLNL, and Sandia National Laboratories (SNL). The facility will permit consolidation of the following contractor (EG&G) functions: LLNL Engineering and Prestaging; LANL Engineering and Prestaging; SNL and Department of Defense (DOD) Engineering; General Technical Services; Research and Development; Administration; and Engineering Measurement Group Management Headquarters. EG&G support to LANL is experiencing a substantial employee turnover (25 percent annually), largely due to commuting time to NTS. The LANL test diagnostics effort has a critical need to attract and retain highly qualified EG&G support work force. A Las Vegas facility to allow some preevent staging for LANL events, in addition to other diagnostics station work, would aid in this regard. In addition, it would be more desirable and efficient to prestage in Las Vegas rather than NTS, due to the evolution of the LANL diagnostic system to digital recording techniques. A lack of an adequate preevent staging area and engineering complex in Las Vegas, coupled with a deterioration in qualified EG&G personnel, could result in costly event delays and/or loss of valuable diagnostic data in the future.

The LLNL space requirement is driven by current overcrowded conditions and the need to support new multiparameter diagnostic systems and increased mechanical fabrication activities. Additional space for shipping/receiving/storage is needed for all programs. Adequate working space for personnel without security clearance is also needed to conform to Department of Energy (DOE) security, safety, and property control procedures.

The proposed facility is also required to replace the present EG&G Sunset Road facility. The need for this replacement is driven by expanded program requirements, the inadequacy of existing space as related to operational requirements, and the pending condemnation of the existing facilities due to a planned new runway at McCarran International Airport. A new runway will be added on land presently occupied by this facility.

The FY 1985 funding will allow initiation of engineering, site preparation, and issuance of a construction contract for a portion of the required building space.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization,
various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

b. Test Facilities Revitalization, NTS

(TEC \$17,800,000; FY 1984 funding \$11,200,000; FY 1985 funding \$6,600,000)

This subproject initiates the revitalization at the NTS in three major functional areas: (1) reconfigure Forward Area camps to replace existing substandard, overcrowded camps and to free-up prime test real estate; (2) test execution support by upgrading facilities to accommodate larger diameter devices and canisters; and (3) initiating an effort to expand and replace personnel support facilities such as housing, dining halls, and recreation facilities.

(1) Reconfigure Forward Camp Areas

The objective of this development plan calls for: (1) relocating facilities in order to access test property; (2) providing larger and more cost-efficient office, shop, and equipment complexes in alternate locations; (3) upgrading and relocating related utilities and access roads; and (4) eliminating substandard facilities.

(a) Event Power System Upgrade, NTS (TEC \$6,100,000; FY 1984 funding \$3,500,000; FY 1985 funding \$2,600,000)

This subproject, which was initiated in FY 1984, will change the event power distribution system for Areas 3, 4, 6, and 7 from 4.16 kV to 12.47 kV and the site operating voltage from 208V to 480V. The 12.4 kV distribution system will use four portable substations to transform the 34.5 kV subtransmission voltage to a 12.47 kV distribution voltage. Two substations will connect into the 34.5 kV line running parallel to Orange Blossom Road on the east side of Yucca Valley, and the other two substations will connect into the 34.5 kV line running parallel to Mercury Highway on the west side of Yucca Valley. From each substation, an underground 12.47 kV circuit will feed a splice can which will be centrally located with respect to the testing areas.

The power system upgrade is vital to LANL for conducting its test program since the current power configuration is an underground distribution system which has experienced severe deterioration as a result of age and ground motion. System failures and insufficient voltage to event sites are being experienced with increased frequency. These power outages and voltage fluctuations damage electronic recording equipment calibration and affect test signals used in diagnosing nuclear weapons test results. These conditions extend the event times; checkouts take longer; and, more importantly, they increase the risk of receiving erroneous or possibly no data from a test.

The FY 1985 funding will complete construction of this subproject.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization,
various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

- (b) Field Operations Support Facility
(TEC \$2,100,000; FY 1984 funding \$200,000; FY 1985 funding \$1,900,000)

This subproject, initiated in FY 1984, will provide a new 16,000-square-foot preengineered metal building to house laboratory, contractor, and DOE personnel in the LLNL test support area.

There are currently 75 supervisory, professional, and clerical personnel housed in deteriorated and crowded trailers disbursed throughout the LANL test support complex. The current trailers have exceeded their use life by 200 percent, are costly to maintain and operate, uncomfortable, and not readily or cost effectively modified. In addition to consolidating personnel and the efficiencies to be gained, the facility will house the 40 percent growth in personnel which is planned in the next several years as a result of programmatic increases.

The FY 1985 funding will complete construction of this subproject.

(2) Test Execution Support

The objective of this development plan calls for: (1) upgrading facilities' capability and capacity to handle additional and larger devices and canisters; and (2) upgrading facilities used for equipment research and fabrication, calibration, installation, and monitoring to service the proposed balanced test program.

- (a) Staging Assembly Tower
(TEC \$6,800,000; FY 1984 funding \$4,700,000; FY 1985 funding \$2,100,000)

This subproject, which was initiated in FY 1984, will provide a twin tower for use by LLNL at the NLV ATLAS Facility. It will provide a 25-foot-wide by 62-foot long by 135-foot high tower with two overhead hoists, four fracture-safe steel columns, and a concrete block enclosure. The tower will be equipped with an elevator, alignment scopes, and welding equipment.

The tower will provide for the assembly and alignment of diagnostic test equipment which collects data on nuclear weapons tests and provides a weatherproof work area for technicians, hardware, and specialized electronics equipment. A fixed amount of time is required for this process for each event, and this twin tower will allow work to be carried on for several events simultaneously. The LLNL test program has moved to heavier and larger diameter devices and canisters, and this trend will continue. The current staging assembly tower is not adequate to handle these packages, and an increased test level under a balanced test program would require that assembly be performed on several devices simultaneously. The new twin tower is required to add operating capacity to handle devices in parallel and to add capability to handle larger and heavier packages.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization,
various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

The FY 1985 funding will allow completion of this subproject.

(3) Personnel Support Facilities

The objective of this development plan calls for upgrading the form of housing, dining halls, and recreation facilities; the plan's initial phasing calls for the construction of dormitories at Mercury and Area 12.

(a) Dormitories - Mercury and Area 12, NTS
(FY 1984 funding \$2,800,000; FY 1985 funding \$0)

This subproject, which was fully funded in FY 1984, provides for the construction of one Type-A dormitory containing 55 12-foot by 20-foot rooms with individual restroom and shower facilities in a two-story building. The building will have a lobby, a laundry room, a mechanical equipment room, and a janitor's room.

These 55 units will replace a portion of the current 4-bed/shared bath trailers, which constitute 60 percent of the housing available at Mercury. The trailer units to be replaced have exceeded their use life by 200 percent, are in violation of DOE fire regulations, and do not provide appropriate or adequate accommodations for personnel who are temporarily assigned to NTS or who must stay on location because of work schedules and operating procedures. The NTS users and contractors believe that adequate, comfortable housing affects the calibre of personnel they are able to attract and retain to work on the nuclear weapons test program.

Improved accommodations are required at the NTS to provide adequate living quarters for scientific and professional personnel who are required to reside at the NTS on a recurring semipermanent basis and also to provide adequate quarters for the permanent Mercury population. Existing housing at Mercury consists of: old trailers; wooden communal-type dormitories; concrete block bachelor officer's quarters; and two-story, motel-type dormitories. The acceptable bachelor officer's quarters and motel-type facilities will accommodate only 230 persons. During the first 5 months of FY 1981, the average monthly peak overnight population was 750 persons. Thus, the monthly peak population exceeds by approximately 350 percent the space available in acceptable facilities. The peak population during an augmented test program is expected to be approximately 1,100 and will severely aggravate the situation.

During peak activity periods, housing scientific and technical personnel in Mercury has two advantages over accommodations in the nearest motels, which are 65 miles away in Las Vegas. First, motel accommodations in Las Vegas would represent a substantial cost to the Government. Second, the travel time (about 2-1/2 hours per day) has a negative effect on efficiency and productivity, especially when these personnel are on extended workdays.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization,
various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

Test Revitalization Capital Equipment, NTS & NLV
(FY 1984 funding \$5,000,000; FY 1985 funding \$0)

FY 1985 funding is requested under Project 85-D-102, Nuclear Weapons Research, Development, and Testing Facilities Revitalization, Various Locations.

Lawrence Livermore National Laboratory (LLNL), Livermore, California

X-ray Calibration and Standards Facilities, LLNL
(TEC \$6,400,000; FY 1984 funding \$2,200,000; FY 1985 funding \$4,200,000)

101 This subproject, which was initiated in FY 1984, provides for: (1) the expansion and upgrade of x-ray characterization equipment and facilities at LLNL, and (2) the acquisition of synchrotron radiation source at the Stanford Synchrotron Radiation Laboratory (SSRL) at Stanford University which makes use of the Stanford Positron-Electron Accelerator Ring (SPEAR).

The first element of this subproject involves the need to improve and replace existing equipment at LLNL, including upgrading of an existing sub-keV x-ray generator. Computer-based control and data acquisition electronics will be provided to facilitate making long and tedious measurements caused by frequent parameter changes and for analyzing and archiving large quantities of data.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization,
various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

The second element of this subproject provides that a new beam line be added to the SPEAR ring which is on land leased from Stanford University. This entails modifications to the storage ring, modifications to an existing high bay facility including the addition of a second floor (2,640 square feet), and the construction of a second story (1,475 square feet) over an adjacent building. The first floor will be a laboratory space housing experimental stations on the new beam lines. The new second floor space will be used for an additional experimental station, separate space for setting up experiments and building mechanical equipment, toilets, a dark room, and storage area.

X-ray diagnostics have received particular emphasis over the past decade, and today they are essential to understanding many nuclear device complexities. This has required the development of a number of new measurement techniques and new types of fast response detectors to characterize absolutely the intensity, time, and energy distribution of weapons-generated x-rays. In the future, laboratory experiments in which weapons conditions are simulated will be possible and will likely require new and unique diagnostics systems. To meet all these requirements, there is an urgent need to improve existing x-ray facilities and to extend radiation source facilities to higher fluxes and shorter pulse widths, and to provide a continuous x-ray energy coverage that is not available from line sources based on available K and L atomic transitions. The synchrotron radiation source will fill that need.

The FY 1985 funding will allow completion of construction for this subproject.

Los Alamos National Laboratory (LANL), Los Alamos, New Mexico

a. X-ray Calibration Capability Upgrade, LANL

(TEC \$4,900,000; FY 1984 funding \$1,300,000; FY 1985 funding \$3,600,000)

This subproject, which was initiated in FY 1984, provides for: (1) the design, procurement, and installation of beam line components at the National Synchrotron Light Source (NSLS) at Brookhaven National Laboratory (BNL), and (2) the expansion and upgrade of x-ray characterization equipment and facilities at LANL.

The first element of this subproject involves the installation of specialized equipment in two existing and available beam line ports. This consists of installing two beam line interfaces to a synchrotron source; installing beam transport; handling capabilities, sample chambers, and data acquisition and reduction equipment. The second element is the upgrade of x-ray characterization facilities at LANL which will consist of both capital construction and equipment procurement/installation. First, a building addition of approximately 1,000 square feet will be provided to house x-ray source, power supplies, and water chillers. Existing building utilities and air-conditioning will be extended to this addition. Second, modifications will be made to rooms within an existing facility. This will include removing, adding, and relocating partitions and utilities within the building.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization,
various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

LANL weapons program needs state-of-the-art characterized x-ray detectors. The present x-ray characterization facilities are at least 20 years old. Equipment in many cases is out of date and is housed in overcrowded quarters. Modern x-ray detector system developments require new types of characterization facilities in order to support the advanced physics experiments associated with the balanced test program. X-ray diagnostics are essential to determining nuclear device performance characteristics, as well as the characteristics of inertial confinement fusion targets. Continued technology advances have required the development of new measurement techniques and new types of fast response detectors to characterize the absolute spectral, temporal, and spatial distribution of the x-rays generated by these devices. Existing x-ray calibration facilities are approaching their technological limits, and a new generation of x-ray sources will be needed to continue the advance in x-ray diagnostic techniques.

A dedicated synchrotron-radiation beam line would allow performance of measurements more quickly, with high accuracy and better spectral resolution than was previously possible. The tunability and intensity of the source would allow measurements on integral detector assemblies and at energies that are otherwise unobtainable. These data could increase by an order of magnitude the ability to measure time-resolved spectral emissions in the weapons test program. Synchrotron-radiation measurements can also be used as experimental verification of theoretical models used as input to weapons design. An example is important experimental measurements to verify calculations of programmatic interest. Similarly, x-ray measurements of materials properties related to weapons design could be facilitated.

The FY 1985 funding will allow completion of the construction for this subproject.

b. Test Fabrication Facilities, LANL (TEC \$8,000,000; FY 1984 funding \$2,500,000; FY 1985 funding \$5,500,000)

This subproject, which was initiated in FY 1984, provides for: procurement and installation of special facilities equipment at the LANL test fabrication shop; construction of a dry run and alignment facility; construction of a wire rope harness fabrication and tensile testing facility with provisions for storage of both raw materials and completed assemblies; construction of a painting facility; and relocation of the tensile test equipment.

The special facilities equipment portion of this project includes: a horizontal boring mill, a metal cutting production band saw, rail-mounted carts for NTS equipment rack assembly and movement between manufacturing processes, portable welding stations, a 3,200-metric-ton socket press, a socket insertion device, a 750,000-pound load cell, and a 50-ton expandable-type trailer.

The dry run and alignment facility project consists of: two 11-foot diameter by 100-foot-deep testing holes; a 25-foot by 50-foot by 100-foot-high, free-standing, enclosed steel frame test tower erected over the test holes; site grading, road improvements, and paving; and utilities including water, natural gas, sewer, steam, condensate, and power. The harness fabrication and tensile testing facility consists of a building approximately 10,000 square feet in area which will be

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization,
various locations

2. Project No.: 84-D-107

8. Brief physical description of project (contd.)

utilized to fabricate and test wire rope harnesses and fabricate weapons test rack assemblies. Relocation of existing tensile test equipment and installation of new deadman anchors will be required. The painting facility portion of this subproject consists of a 2,400-square-foot building with a 20-foot-high bay for final completion and painting of the weapons test rack assemblies.

The purpose of this subproject is to provide for the construction and equipping of a new facility to support the NTS weapons test program and to provide for the procurement and installation of special equipment at the existing fabrication shop to produce weapons test rack assemblies. The existing facilities for down-hole testing and alignment, as well as harness fabrication, are inadequate to meet the physical size requirements of the weapons test rack assemblies planned by LANL. New facilities and special equipment must be provided to meet weapons test program schedules. The existing facilities are not capable of completely handling the alignment of larger diameter weapons test rack assemblies. Alignment is a complicated procedure and surface-mating specifications are very stringent, as are the specifications on vacuum and pressure systems. The new facility will provide a capability to test and equip weapons test rack assemblies up to 10 feet in diameter and wire rope harness diameters of 3 inches.

The FY 1985 funding will allow completion of construction for this subproject.

9. Purpose, justification of need for, and scope of project

This project provides for initiating the most urgent subprojects to revitalize the capital asset base of the nuclear weapons testing complex to assure the capacity and capability of the complex to achieve and maintain a balanced annual test program on a long-term sustainable basis.

The need for a test complex revitalization program was identified in a study completed in January 1982. The study was conducted by a task force comprised of representatives from the Office of Military Application, Nevada Operations Office, and the three weapons laboratories. All aspects of the test complex capital asset base were critically reviewed during the study, and priority resource requirements were developed by year and site within the context of achieving and sustaining a balanced, long-term test program in excess of the FY 1981 level of testing.

Several factors have contributed to the current situation. One such factor is the history of the overall test program itself. The history has been one of great fluctuations and very dynamic programs. These programs have fluctuated over the years due to political uncertainties and shifts in national policy relating to underground nuclear testing and nuclear deterrence. Many of the NTS facilities are temporary, were built 10-20 years ago, and are now completely overage and deteriorated. Within the laboratories, capital funding for facilities dedicated to the test program has been sporadic at best. Many facilities now in use were built originally for other purposes.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization
various locations

2. Project No.: 84-D-107

9. Purpose, justification of need for, and scope of project (contd.)

Another factor is the combination of increased complexity and workload confronting the program. To a large extent, the requirements for information in the test program mirror the pace and scope of the underlying research and development effort. As designs become more complex and the frontiers of technology are pushed out further in the laboratories, more information of increasing detail is required from each experiment associated with a device test. Today's device tests are much more complicated than tests conducted 10 years ago. Couple this with an overall increase in the DOE and work for others testing workload, and it becomes obvious that additional diagnostic capacity and capability will be necessary at the NTS and the laboratories if the test program is to continue to support the research and development process in a timely and effective manner.

138 Technology changes are another factor contributing to the need for facilities and equipment. This relates directly to the designer's need for more precise measurements over broader energy spectra. The technology to meet these requirements exists today and can be cost-effectively incorporated in the program to assure maximum scientific output.

The last major factor driving the need for the test complex revitalization effort is the nature and geography of NTS. Many of the NTS facilities were placed in their present locations many years ago to serve a purpose that was appropriate at that time. As test real estate has been used up, some of the facilities, in addition to being old, are not presently in the most advantageous location. Some facilities actually occupy prime test real estate which, as time goes by, is becoming more precious. The lack of real estate at Yucca Flat is beginning to force more tests to Pahute Mesa, especially for those tests near the Threshold Test Ban limitation of 150 kt. Future projections show the test program being conducted on Pahute Mesa. This condition will require new and upgraded facilities in that area in order to keep operating costs down. Facilities are needed in Las Vegas in order to reduce the number of people who have to travel the 70-120 miles to the test site. It has been proven that much of the experimental assembly work can be accomplished in Las Vegas and then moved to NTS for final adjustments, alignments, etc. These facilities are needed in order to attract and maintain the most capable people for the program. Better housing, eating, and recreation facilities are needed at NTS because: (1) many of the existing facilities are substandard, and (2) today's top engineers, scientists, technicians, and craftsmen cannot be attracted to NTS jobs if they must use existing facilities. Some additional facilities are required because of the added workload imposed by the increased test program, coupled with other work being performed at NTS.

The FY 1984 and FY 1985 funding for this project provides for only a few of the more critical line item construction project requirements necessary to support the objective of achieving and sustaining a balanced, long-term test program.

The nuclear weapons development program is made up of a highly complex set of activities extremely dependent on current and advanced technology facilities and equipment to meet its varied needs. In turn, the successful performance of the research and development (R&D) program contributes directly to the quality and reliability of the nuclear weapons stockpile.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization
various locations

2. Project No.: 84-D-107

9. Purpose, justification of need for, and scope of project (contd.)

The consolidation of the nuclear weapons RD&T revitalization needs into a new FY 1985 initiative focuses the issue of the total needs of the RD&T program and is illustrative of the interdependence of the R&D and test programs to: (1) develop and apply nuclear weapons technology to maintain and improve current weapon systems, and (2) develop new weapons for the nuclear weapons stockpile in accordance with national security requirements.

10. Details of cost estimates a/

Total cost

a. Engineering, design, and inspection	)	
b. Construction costs	)	
(1) Improvements to land	)	
(2) Buildings and building modifications	)	\$75,200
(3) Other structures	)	
(4) Special facilities	)	
(5) Utilities	)	
c. Standard equipment	)	
d. Removal cost less salvage	)	
e. Contingency	)	
Total estimated cost		\$75,200

The estimates by location are as follows:

Nevada Test Site and North Las Vegas ATLAS Facility, Nevada	\$55,900
Los Alamos National Laboratory, New Mexico	12,900
Lawrence Livermore National Laboratory, California	6,400
Total	\$75,200

11. Method of performance

Design and procurement of the conventional facilities will be performed under negotiated architect-engineer contracts. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding. Design and procurement of the special facilities will be performed by the operating contractor.

a/ Based upon completed conceptual designs.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear testing facilities revitalization,
various locations

2. Project No.: 84-D-107

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$19,800	\$38,600	\$ 9,000	\$ 7,800	\$75,200
Total facility costs	19,800	38,600	9,000	7,800	75,200
2. Other project funding					
(a) Conceptual design	\$ 350	\$ 0	\$ 0	\$ 0	\$ 350
(b) Other project related funding	0	0	0	0	0
Total other project funding	350	0	0	0	350
Total project funding (items 1 and 2)	\$20,150	\$38,600	\$ 9,000	\$ 7,800	\$75,550 <u>a/</u>

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design

Conceptual design cost of \$350,000 is necessary to develop a budget quality cost estimate and construction schedule.

(b) Other related funding requirements

The estimated programmatic life of these facilities varies by site and subproject.

The other related funding requirements for these facilities are not considered to be significantly different from those of the facilities and equipment being replaced by this project. Therefore, no costs are shown.

a/ This total includes \$20,150 which is from years prior to FY 1985.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Buffer land acquisition, LLNL & SNLL, Livermore, California	2. Project No.: 83-D-199
3. Date A-E work initiated: 1st Qtr. FY 1984	5. Previous cost estimate: None Date:
3a. Date physical construction starts: 2nd Qtr. FY 1984	6. Current cost estimate: \$34,000 Date: 1/84
4. Date construction ends: 4th Qtr. FY 1986	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1984	\$ 7,000	\$ 7,000	\$ 7,000	\$ 5,600
1985	17,000	17,000	17,000	18,400
1986	10,000	10,000	10,000	10,000

8. Brief physical description of project

This project provides for acquiring approximately 388 acres of land surrounding the Lawrence Livermore National Laboratory (LLNL) and Sandia National Laboratories, Livermore (SNLL) sites. The land to be acquired adjacent to LLNL would be to the west and the north of existing boundaries. At SNLL, the land would be adjacent to the west, east, and south boundaries. Title to the lands will be in fee simple and include all rights--air, surface, and subsurface. The amount of land to be acquired will probably be greater than the 388 acres needed because of the effects of severance; that is, the Government may be required to purchase a whole parcel of land rather than just a portion because the remaining portion could be landlocked or an otherwise uneconomic remnant.

No improvements to land will be accomplished by this project. However, safeguards and security improvements such as fencing and perimeter lighting are planned to be accomplished under Project 85-D-103, Safeguards and Security Enhancements, Livermore, California.

FY 1984 funding will purchase the first 36.33 acres adjacent to the west side of LLNL. The FY 1985 funding will finance the acquisition of the remaining portion of the land, 159.67 acres, adjacent to the west and north of LLNL. The land adjacent to SNLL, 192 acres, will be acquired in FY 1986.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Buffer land acquisition, LLNL & SNLL,
Livermore, California

2. Project No.: 83-D-199

9. Purpose, justification of need for, and scope of project

During the past 2 years, LLNL has been the target of a number of public demonstrations, generally protesting LLNL's nuclear weapons activities. The largest of these involved about 3,500 people and spanned two days. Over 1,300 arrests were made. These activities are expected to continue and may increase in intensity. There has been increasing concern over possible terrorist attacks against nuclear weapons facilities.

Up to this time, the Department of Energy (DOE) has relied upon adjacent agricultural and largely undeveloped land to provide a de facto buffer zone for the laboratories. However, development is progressing rapidly in the direction of the laboratories and this de facto buffer zone may not exist in the near future.

143 By acquiring this land, the DOE will be able to create a security buffer zone that will provide for the early detection of unauthorized intrusions from the outside allowing LLNL and SNLL protective forces to respond immediately to challenge or contain the intruders. Additionally, providing a buffer zone will preclude industrial development up to the laboratory borders with the inherent threat of covert electronic surveillance and the creation of a possible staging area for intrusions.

10. Details of cost estimate a/

	<u>Total cost</u>
a. Land and land rights	\$34,000
Total estimated cost	<u>\$34,000</u>

11. Method of performance

The U.S. Army Corps of Engineers will represent the DOE in the acquisition of the land.

a/ Based on a real estate appraisal.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Buffer land acquisition, LLNL & SNLL,
Livermore, California

2. Project No.: 83-D-199

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item	\$ 5,600	\$18,400	\$10,000	\$34,000
Total facility cost	\$ 5,600	\$18,400	\$10,000	\$34,000
2. Other project funding				
(a) Appraisal costs	\$ 8	\$ 0	\$ 0	\$ 8
Total other project funding	\$ 8	\$ 0	\$ 0	\$ 8
Total project costs (Items 1 and 2)	\$ 5,608	\$18,400	\$10,000	\$34,008

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

2. Other project funding

(a) Appraisal costs

Approximately \$8,000 was required to prepare an estimate of the amount of land to be acquired and determine its fair market value.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Simulation technology laboratory,
Sandia National Laboratories, Albuquerque, New Mexico	2. Project No.: 82-D-144
3. Date A-E work initiated: 4th Qtr. FY 1982	5. Previous cost estimate: \$40,000
Date: 1/83
3a. Date physical construction starts: 4th Qtr. FY 1983	6. Current cost estimate: \$39,000
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1987	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
145	1982	\$ 1,200	\$ 1,200	\$ 1,200	\$ 33
	1983	3,000 <u>a/</u>	3,000 <u>a/</u>	2,998 <u>a/</u>	1,156
	1984	8,000	8,000	8,002	4,184
	1985	16,500	16,500	16,500	8,200
	1986	10,300	10,300	10,300	14,600
	1987	0	0	0	10,827

8. Brief physical description of project

This project provides for the construction of one accelerator, Hermes III; the modification of an existing accelerator, Particle Beam Fusion Accelerator-I (PBFA-I); the necessary laboratory space for housing the Hermes III accelerator and other existing accelerators to be moved to the Simulation Technology Laboratory (STL); a control room; and the supporting diagnostics and data acquisition systems. Also included is laboratory space for experiments associated with utilization of the accelerators. The laboratory building consists of approximately 54,900 square feet--42,200 square feet of high bay/low-bay laboratory, and 12,700 square feet of light laboratory/office space. Utilities, including water, sewer, underground power, and natural gas, will be extended from existing nearby utility systems.

a/ Based on Continuing Resolution, Public Law 97-377.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Simulation technology laboratory,
Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 82-D-144

8. Brief physical description of project (contd.)

The building will be constructed of prestressed, precast concrete wall and roof panels with integral wall insulation. Portions of the building below grade will be cast-in-place concrete. Special systems for storage, transfer, and processing of deionized water and transformer oil will be provided.

Hermes III will be an advanced gamma-ray simulator which will run at higher voltages, higher currents, and shorter pulses than the existing Hermes II accelerator. A factor of 10 in increased performance, coupled with increased exposure area, will allow testing of subsystems and systems which cannot be tested at Hermes II. The modified PBFA-I accelerator will be an advanced x-ray simulator which will provide higher fluences for larger area exposures and improved spectrum compared to existing x-ray sources such as Rehyd, Hydra, and Proto II. The modified PBFA-I will allow x-ray testing that is currently needed, but not now possible.

The FY 1985 funding will be used for continuing construction of the laboratory building and to procure components of the new accelerator.

9. Purpose, justification of need for, and scope of project

In order to develop simulation testing capabilities and apply them to the conduct of weapon effects tests on a timely basis, facilities dedicated to such uses are required. The simulation sources to be associated with the STL will be major improvements over the gamma-ray and x-ray laboratory sources that are presently available. They will, in many instances, have capabilities which match or are superior to the capabilities of underground testing. For example, the new radiation sources in STL will possess a better match to vulnerability requirements of dose, dose rate, pulse width, and spectral character than is presently available. Exposure areas available for testing will satisfy most agency requirements. In addition to weapons effects testing, the simulation sources will be available for use in future weapon system development and stockpile evaluation programs.

Justification for the STL rests on the fact that future United States nuclear weapon systems such as the PEACEKEEPER and TRIDENT II will require new laboratory radiation facilities for vulnerability, hardening, and survivability testing. Existing laboratory simulation facilities simply cannot provide the necessary output levels over adequate exposure areas and volumes. Furthermore, existing facilities cannot address vulnerability problems associated with potential new defensive weapons such as directed energy devices. In the event of a comprehensive test ban treaty (CTB), these sources would be vital to the maintenance of a viable weapon system development program and the associated strong defense posture.

Directed energy weapons, using particle beams or lasers, offer great promise. High-intensity particle beams and radiation fields are central to these schemes. STL facilities will offer means for studying the propagation of high-intensity particle

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Simulation technology laboratory,
Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 82-D-144

9. Purpose, justification of need for, and scope of project (contd.)

beams and the physics of x-ray lasing. The energy densities needed for such studies are now available only in underground nuclear tests. Experimental study of the physics of these phenomena, to the extent possible in STL, would be less expensive and more efficient than through underground nuclear tests.

A dedicated simulation facility with vastly improved capabilities is possible because of recent advances in Sandia's Pulsed Power Program and increased understanding of electron beam transport physics. The STL would contain Hermes III, an advanced gamma-ray simulator. Hermes III is projected to be capable of delivering up to 0.6 million joules of e-beam energy in a single pulse to a bremsstrahlung converter target. A modified PBFA-I will be capable of delivering up to 0.5 million joules of energy to x-ray producing targets in a single pulse.

If STL were not constructed, essential radiation effects testing activities associated with development and hardness assurance of future weapon systems would be impacted. Existing sources such as Hermes II would have to continue to be utilized for testing. This source is more than 10 years old, is experiencing serious operational problems because of age, and should be replaced. While the existing simulation sources have made significant contributions to the development of many United States weapon systems, they have not adequately matched important threat environmental characteristics that generate dose-rate-dependent radiation effects. The new advances in pulse power technology will make it possible to substantially improve this match and to achieve higher exposure levels over larger areas that will be required for testing of future systems.

The reduction in the total estimated cost reflects adjustments made to current lower-than-anticipated inflation rates for construction.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 25% of construction costs		\$ 7,000
b. Construction costs		27,000
(1) Improvements to land, including grading, paving, and fencing	\$ 200	
(2) Building, approximately 54,900 square feet at about \$155 per square foot	8,500	
(3) Special facilities, Hermes III and modifications to PBFA-I	16,800	
(4) Utilities, including mechanical utilities, sanitary and storm sewers, and electrical power .	1,500	
	Subtotal	\$34,000
c. Contingency at approximately 15% of above costs		5,000
	Total estimated cost	\$39,000

a/ Based upon completed conceptual design and partially completed Title I and Title II design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Simulation technology laboratory,
Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 82-D-144

11. Method of performance

Design and inspection of the building will be on the basis of a negotiated fixed-fee contract. Construction will be by fixed-price contract awarded on the basis of competitive bids. Sandia National Laboratories will design, procure, and install the accelerator and instrumentation components.

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>Total</u>
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 5,373	\$ 8,200	\$14,600	\$10,827	\$39,000
Total facility costs	<u>5,373</u>	<u>8,200</u>	<u>14,600</u>	<u>10,827</u>	<u>39,000</u>
2. Other project funding					
(a) Conceptual design	30	0	0	0	30
(b) Other project related funding .	9,550	1,700	1,300	800	13,350
Total other project funding .	<u>9,580</u>	<u>1,700</u>	<u>1,300</u>	<u>800</u>	<u>13,380</u>
Total project funding (items 1 and 2)	\$14,953	\$ 9,900	\$15,900	\$11,627	\$52,380

b. Other related funding requirements (estimated life of project: 20 years)

1. Facility operating costs	\$ 340
2. Programmatic operating expenses directly related to the facility	6,000
3. Capital equipment not related to construction but related to the programmatic effort in the facility	500
4. GPP or other construction related to programmatic effort in the facility	450
Total other related funding requirements.....	<u>\$ 7,290</u>

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project funding

- (a) Conceptual design was prepared by an architect-engineering firm at a cost of \$30,240.
- (b) Research and development effort related to development of the accelerators.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Simulation technology laboratory,
Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 82-D-144

13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Other related funding requirements

It is estimated that the programmatic life of this facility will be 20 years.

1. Facility operating costs

Utility, janitorial, and maintenance costs estimated at approximately \$8 per square foot annually.

2. Programmatic operating expenses directly related to the facility

Salaries and supplies for approximately 60 people estimated at \$100,000 per person, per year.

3. Capital equipment not related to construction but related to the programmatic effort in the facility

Equipment requirements estimate to maintain the annual programmatic effort. No installations of new programmatic-related capital equipment are anticipated.

4. GPP or other construction related to programmatic effort in the facility

Construction requirements estimate to maintain the annual programmatic effort.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing

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

1. Title and location of project: Weapons materials research and development facility, Lawrence Livermore National Laboratory, Livermore, California	2. Project No.: 82-D-150
3. Date A-E work initiated: 1st Qtr. FY 1980 <u>a/</u>	5. Previous cost estimate: \$25,900
Date: 1/83
3a. Date physical construction starts: 4th Qtr. FY 1982	6. Current cost estimate: \$28,300
Less amount for PE&D: <u>1,100</u> <u>a/</u>
Net cost estimate: \$27,200
Date: 1/84
4. Date construction ends: 1st Qtr. FY 1987	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1981	1982	\$ 2,500	\$ 2,500	\$ 2,500	\$ 120
	1983	5,000 <u>b/</u>	5,000 <u>b/</u>	5,000 <u>b/</u>	1,935
	1984	2,900	2,900	2,900	4,185
	1985	16,800	16,800	16,800	9,860
	1986	0	0	0	9,900
	1987	0	0	0	1,200

8. Brief physical description of project

This project will provide a new building at the Lawrence Livermore National Laboratory (LLNL) and modifications to two existing buildings. The new Weapons Materials Research and Development Facility will consist of a one-story laboratory area and two-story office area. The gross area of the building will be about 87,000 square feet consisting of about 22,600 net square feet of laboratory space, about 18,500 net square feet of office space, and 15,500 net square feet of miscellaneous space, including a partial basement. The remainder of the area will be in mechanical rooms, utility corridors, reception areas, halls, and restrooms.

a/ Funds for design of this project were provided under Project 79-8, Plant Engineering and Design, Various Locations.

b/ Based on Continuing Resolution, Public Law 97-377.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Weapons materials research and development facility, Lawrence Livermore National Laboratory, Livermore, California	2. Project No.: 82-D-150
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8. Brief physical description of project (contd.)

The building will be constructed of fire-resistive materials. Laboratory furniture and fume hoods will be provided in the laboratories. Some areas will be designed to provide close temperature and humidity control. Special ventilation and floor covering will be installed in areas where toxic or radioactive materials are used. Isolated power for some sensitive instruments, emergency power, and electromagnetic shielding in some areas will also be provided. Automatic fire sprinklers, hydrogen alarms, and other safety devices will be installed.

Approximately 5,000 square feet of the existing development and assembly building will be converted to laboratory and office use for welding development and polymeric materials work. Some modifications will also be required in the refractory materials building, primarily to accommodate relocation of surface science work. Special facilities to be provided by this project include: laser and work stations, vacuum induction furnaces, hot isostatic press, scanning auger microprobe, and powder metallurgy equipment.

Normal site utilities will be extended from nearby sources. Site development will include grading, paving, offstreet parking, fencing, security screens, and landscaping.

The FY 1985 funding requested provides for the completion of these facilities. The increase in the total estimated cost of this project is due to the significant stretchout in the funding of this project resulting in additional costs due to construction inefficiencies and escalation.

9. Purpose, justification of need for, and scope of project

The present materials research and development facilities at LLNL are marginally adequate for current weapons work and are inadequate for advanced development and future weapons work. Nuclear weapons must be able to survive extreme environments and function reliably over a long stockpile life. In addition, new design demands include smaller, safer, cheaper, and even longer-lived systems. Satisfying any or all of these requirements means solving materials problems and requires the appropriate facilities for advanced materials work.

The current materials science effort at LLNL is constrained by limitations. Many of the existing laboratories are in buildings that are inappropriate for experimental and analytical materials work, thereby compromising the current effort. Sensitive materials-characterization instruments (scanning electron microscopes, electron microprobes, etc.) are widely scattered and are not isolated from vibration and electrical interference. In some cases, computer-controlled experiments and the attending instruments are not isolated from line power fluctuations or provided with access to adequate cooling water. Other technologies simply cannot be accommodated because of space limitations. In addition, 60 percent of the current staff work is in trailers, a condition which was prompted more than 15 years ago by the need to move offices out of the permanent buildings so that equipment and laboratories could be better accommodated.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons materials research and development facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 82-D-150

9. Purpose, justification of need for, and scope of project (contd.)

The weapon systems entering the stockpile today are constructed of materials and by methods that were the state-of-the-art fifteen or more years ago. These technologies are not effectively meeting all present program needs.

The current facility limitations have dictated that applicable advances in nuclear weapons materials technology lag the field as a whole. The specific tuning and adaptation of technologies (such as high-rate forming, powder metallurgy, rapidly solidified materials, high-energy laser processing, and ion implantation to weapons materials and specific design requirements) has not been possible.

The capability afforded by this facility will be directed at key areas which support the weapons program, including: stockpile management; generation of prototype hardware and components required for experiments and Nevada tests; materials failure analysis from experiments; tests to support redesign; and substitute materials and processing techniques for use when availability or costs require changes. There are currently a multitude of new materials, ideas, and concepts which are not being pursued because the existing facilities are inadequate. Other technologies have not been developed because the necessary facilities do not exist. For example, the development of the high-rate forming process in the early 1970's on stainless steel resulted in a threefold increase of the yield strength of this material for nuclear components. Advances of this magnitude in beryllium and uranium are projected and are limited only by the lack of the necessary facilities.

There are other technologies for which the facilities do not exist. Continuous-wave and pulsed lasers offer great promise for welding, machining, glazing, and shock hardening. The areas of amorphous materials and powder metallurgy promise to offer a new generation of materials having improved properties at reduced cost while conserving raw materials.

The benefits to be derived by advancing LLNL's materials technology base and by providing the necessary laboratory facilities are straightforward. In a more subtle manner, providing permanent staff housing will also contribute significantly to the weapons programs. This integrated facility brings together the key materials scientists working on the weapons programs. The current overcrowded conditions are eliminated, operating efficiency is enhanced, and security is improved because the "need to know" axiom of classified work can be readily adhered to.

Spaces vacated as a result of the moves into the Weapons Materials Research and Development Facility will be modified to benefit the weapons program; e.g., the materials joining laboratories, a heavily used weapons capability, will be expanded as other laboratories are moved into the facility. The existing laboratories to be upgraded and moved to the facility have been carefully chosen on the basis that their current housing cannot be economically upgraded. Thus, the new facility not only provides needed additional space but assures an appropriate environment for much of the specialized equipment necessary for materials research and development.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons materials research and development facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 82-D-150

9. Purpose, justification of need for, and scope of project (contd.)

This facility will provide the environment necessary to expand the current weapons material technology base to attain program goals of:

Increased stockpile life

A primary goal is evaluating weapons currently in the stockpile to predict reliability and lifetime. This facility will upgrade materials characterization technology to improve the ability to specify materials for weapons components and to investigate materials failure modes that are discovered during component testing or stockpile life. Using new characterization instruments, it will be possible to conduct more sensitive accelerated-aging and materials compatibility tests. The predictive information from these tests will enable the agency to upgrade the stockpiled weapons on the necessary timescale.

Weapon safety

The weapons program is committed to nuclear weapons concepts that provide more deployment options with increased safety--a design thrust that is primarily limited by material performance. This facility provides laboratories that can produce a new generation of superior materials meeting the demanding design requirements necessary for safer nuclear explosives. These facilities will aid the development of materials that enable nuclear weapons to be safely contained in aircraft fuel fires. Advances in powder metallurgy technology will significantly benefit the fabrication of complex shapes such as those found in mechanical safe arming devices.

Security

Denying the unauthorized use of nuclear weapons is a key goal that depends almost entirely on an imaginative, vigorous materials and engineering effort. Improvements on many mechanical and chemical denial schemes will result from work in amorphous materials, ion implantation, and organic materials.

Increased special outputs

The need for weapons having tailored outputs makes demands on both the designer and material scientists. Recent designs have pushed to the limit the existing inventory of metallic alloys and the techniques of joining materials. The need for refractory metal alloys, reactive metals, and the noble metals represent only part of the demand; i.e., specialized thermomechanical processing in the new high-energy rate forming laboratory will assist in the development of alloys having the necessary mechanical properties.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project:	Weapons materials research and development facility, Lawrence Livermore National Laboratory, Livermore, California	2. Project No.:	82-D-150
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9. Purpose, justification of need for, and scope of project (contd.)

Reduced weapon size

Reducing the size and weight of nuclear weapons is heavily dependent on advances in materials technology. The technologies of high-energy rate forming, chemical vapor deposition, amorphous materials, powder metallurgy, and composites promise to provide the next generation of high-strength materials required by the design of smaller devices.

Reduced cost

Cost-effective weaponization of designs is an important goal, and these facilities can potentially reduce the costs of weaponization. For example, in certain weapons designs, the properties of available materials have been limiting factors, and programmatic scientists have relied on extensive engineering design to overcome material limitations. All laboratory facilities are dedicated to produce the next generation of materials and alloys that will significantly reduce the engineering design and testing currently required. Improved materials not only simplify weapon design but improve performance and reliability.

Support of nuclear testing

The nuclear test effort is a key part of the weapons program. This facility is designed so that most laboratories can make prototype hardware for tests in Nevada, in addition to developing new materials technology. This is crucial to advanced development concepts, which rely heavily on state-of-the-art materials capabilities.

OSHA requirement

The agency is committed to provide safe working conditions and to protect the environment. New adhesives and improved composites promise to be much stronger than materials currently in use, but many of these materials are potentially carcinogenic. This project provides funds to upgrade vacated space to safely explore these materials.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons materials research and development facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 82-D-150

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 9% of construction costs, item b		\$ 1,590
(1) Engineering and design (items b.(3) and b.(4) below)	\$ 730 b/	
(2) Construction inspection (approximately 4%)	860	
b. Construction costs		20,710
(1) Improvements to land including grading, paving, sidewalks, curbs and gutters, fencing, security screens, and landscaping	550	
(2) Building, approximately 87,000 square feet at about \$169 per square foot	14,660	
(3) Other structures, modifications of two existing buildings	850	
(4) Special facilities, electron microscope, electric furnaces, press, etc.	4,000	
(5) Utilities including mechanical utilities, sanitary and storm sewers, electrical power, communications lighting, and laboratory waste retention system	650	
c. Standard equipment including office furniture, projection equipment, etc.		1,950
d. Removal cost less salvage (relocate office trailers and scientific apparatus)		650
	Subtotal	24,900
e. Contingency at approximately 9% of above costs		2,300
	Total estimated cost	\$27,200 c/

11. Method of performance

Design is being performed under a negotiated architect-engineer contract. To the extent feasible, construction and procurement will be accomplished by fixed-price contract awarded on the basis of competitive bids. Minor architect-engineering work, preparation, and activation will be performed by LLNL.

a/ Based upon completed Title I and Title II design.

b/ The design of building modifications and special facilities will be performed during new building construction.

c/ Excludes \$1,100,000 funded from FY 1979 plant engineering and design funds.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons materials research and development facility, Lawrence Livermore National Laboratory, Livermore, California

2. Project No.: 82-D-150

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>Total</u>
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 6,240	\$ 9,860	\$ 9,900	\$ 1,200	\$27,200
(b) PE&D	1,100	0	0	0	1,100
Total facility costs	\$ 7,340	\$ 9,860	\$ 9,900	\$ 1,200	\$28,300
2. Other project funding					
(a) Conceptual design	85	0	0	0	85
Total other project funding.....	85	0	0	0	85
Total project funding (items 1 and 2) ..	\$ 7,425	\$ 9,860	\$ 9,900	\$ 1,200	\$28,385
b. Other related funding requirement (estimated life of project: 40 years)					
1. Facility operating costs					\$ 480
2. Programmatic operating expenses directly related to the facility					16,270
3. Capital equipment not related to construction but related to the programmatic effort in the facility ..					300
4. GPP or other construction related to programmatic effort in the facility					60
Total other related funding requirements					\$17,110

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
2. Other project funding
 - (a) Conceptual design

Total funding in this classification represents the conceptual design cost to obtain a budget quality estimate.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons materials research and development facility, Lawrence Livermore National Laboratory, Livermore, California	2. Project No.: 82-D-150
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13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Other related funding requirements

1. Facility operations costs

Operating costs of the facility are estimated to be \$480,000 per year including \$113,970 escalation (based on FY 1980 average maintenance and utility costs of \$4.21 per square foot escalated to 7 percent per annum to \$5.52 in the first quarter of FY 1985).

2. Programmatic operating expenses directly related to the facility

This estimate is for 180 total programmatic materials research and development personnel at an annual average of \$90,387 per person in FY 1985. Ninety percent of these people are presently housed in existing diverse buildings and trailers and will be moved to this new facility. The operating funds for these people are a normal part of the past and current programs. The remaining 10 percent represents growth projected to FY 1984. Funds for this growth have been included in program projections.

3. Capital equipment not related to construction but related to the programmatic effort in the facility

This is an average annual estimate which includes both the small items needed for continuous operation of the facility and the occasional large item (over \$200,000), which cannot be described at this time but can be predicted as needed to maintain technical excellence in efforts conducted in the facility.

4. GPP or other construction related to programmatic effort

Initially, no GPP costs are anticipated, but to keep abreast of technology, presently undefined alterations will likely be required in the future.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Research, Development, and Testing

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

1. Title and location of project: Earthquake damage restoration, Sandia National Laboratories, Livermore, California	2. Project No.: 81-D-134
3. Date A-E work initiated: 4th Qtr. FY 1981	5. Previous cost estimate: \$3,700 Date: 1/82
3a. Date physical construction starts: 3rd Qtr. FY 1983	6. Current cost estimate: \$8,600 Date: 1/84
4. Date construction ends: 4th Qtr. FY 1986	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
150	1981	\$2,000	\$1,000	\$ 230	\$ 0
	1982	0	1,000	1,770	0
	1983	1,700	1,700	1,700	351
	1984	0	0	0	3,349
	1985	4,900	4,900	4,900	2,700
	1986	0	0	0	2,200

8. Brief physical description of project

This project will provide seismic upgrading for five major buildings and various small buildings at the Sandia National Laboratories facilities in Livermore, California (SNLL). The objective is to modify these buildings, wherever it is economically feasible, to meet the structural requirements of the current Uniform Building Code (UBC). Two of the five buildings will be modified with the funding provided through FY 1983. The FY 1985 funding will finance the modification of the remaining three buildings including the tritium research laboratory.

The upgrading of the administration and engineering buildings, which together house over half the staff at SNLL, will consist of installing shear walls, concrete buttresses, and other frame bracing to stiffen the concrete frames against longitudinal and transverse lateral loads. In a shop and laboratory building, and in a building housing test equipment, corrections will consist of upgrading structural connections between high-bay and low-bay sections, strengthening truss to column connections, stiffening column bases, and strengthening wall ties.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Earthquake damage restoration, Sandia National Laboratories, Livermore, California	2. Project No.: 81-D-134

8. Brief physical description of project (contd.)

Upgrading the Tritium Research Laboratory will consist of installing roof ties and external buttresses for lateral bracing to resist lateral accelerations of 0.8 g. This strengthening exceeds UBC requirements; however, the critical nature of this facility dictates that additional safety margins be provided. A hardened vault for tritium storage will also be added.

Various small buildings on the southern part of SNLL will also be seismically strengthened.

Funds requested for FY 1985 will provide for the completion of all construction for this project.

9. Purpose, justification of need for, and scope of project

The major buildings at SNLL were built in 1957 and 1958. Design for these buildings was in conformance with the 1955 UBC. Building code requirements, with regard to seismic considerations, have changed significantly over the last 25 years since the initial facilities were designed and built at the Livermore site. Over the years, additions to some of the main laboratory buildings have been required and some structural problems have occurred. These problems were corrected as they occurred. During the period between mid-1976 and the end of 1978, a consulting structural engineering firm evaluated each of the major structures mentioned above and made recommendations to improve the seismic characteristics at each building. This project will implement those original recommendations as well as some more recent recommendations.

The January 24, 1980, magnitude 5.5 earthquake just north of Livermore caused some damage to the laboratory facilities. In general, the older concrete buildings incurred cracking in several curtain walls and in numerous structural columns. The strongest aftershock on January 26, 1980, caused similar but much less extensive damage. The Tritium Research Laboratory, a steel column, steel beam building with tilt-up concrete walls, sustained no structural damage. However, a few hairline cracks appeared in some exterior wall panels. In 1979, this building had been structurally upgraded to withstand a lateral acceleration of 0.28 g. The recent earthquake is estimated to have imposed lateral accelerations somewhere between 0.2 and 0.3 g's. This project will upgrade this facility to withstand accelerations of 0.8 g's. All of the other major buildings at SNLL will be modified to meet the lateral structural requirements of the current UBC, wherever it is economically feasible. SNLL is located in an active seismic zone and earthquakes equal to or of a greater magnitude are possible in the future, making this seismic upgrade program a prudent action.

Prior to the start of Title I and Title II design of these upgrades, a pre-Title I study was performed to verify the extent of the structural upgrades necessary, as preliminary estimates of upgrades and costs were done hurriedly in order to provide to the Congress estimates of our funding requirements. Congress added the first increment of funding for these upgrades in FY 1981. This pre-Title I study showed that the structural upgrades required to comply with the UBC were far more extensive than originally envisioned. The current cost estimate of \$8,600,000 reflects these more extensive and seriously needed structural upgrades which are based on a more detailed structural analysis of the facilities and a more detailed cost estimate.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Earthquake damage restoration, Sandia National Laboratories, Livermore, California

2. Project No.: 81-D-134

10. Details of cost estimate a/

a. Engineering, design, and inspection at approximately 19% of construction costs, Item b		\$1,200
b. Construction costs		6,400
(1) Building modifications	\$6,400	
	Subtotal	<u>7,600</u>
c. Contingency at approximately 13% of above costs		<u>1,000</u>
		<u>\$8,600</u>

11. Method of performance

Design will be accomplished by negotiated architect-engineer contract and construction by fixed-price contracts awarded on the basis of competitive bids.

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>Total</u>
a. Total project funding				
1. Total facility costs				
(a) Construction line item	\$3,700	\$2,700	\$2,200	\$ 8,600
Total facility costs	<u>3,700</u>	<u>2,700</u>	<u>2,200</u>	<u>8,600</u>
2. Other project funding				
(a) Conceptual design	40	0	0	40
(b) Other project related costs	<u>930</u>	<u>0</u>	<u>0</u>	<u>930</u>
Total other project funding	<u>970</u>	<u>0</u>	<u>0</u>	<u>970</u>
Total project funding (items 1 and 2)	<u>\$4,670</u>	<u>\$2,700</u>	<u>\$2,200</u>	<u>\$ 9,570</u>
b. Other related funding requirements (estimated life of project: 40 years)				
1. Facility operating costs				\$ <u>0</u>
Total other related annual funding requirements				<u>0</u>

a/ Based upon completed pre-Title I and partially completed Title I and Title II design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Earthquake damage restoration, Sandia National Laboratories, Livermore, California	2. Project No.: 81-D-134
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13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project related funding
(a) Conceptual design

Total funding in this classification represents the conceptual design cost to obtain a budget quality estimate.

- (b) Other project related costs

Seismic studies and building structural modifications have been a continuing project at SNLL, and have been both GPP and expense funded throughout the period 1967-1982.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>Inertial Confinement Fusion</u>	\$ 169,700	\$ 138,000

The experimental capabilities and theoretical and computational expertise established through inertial fusion research contribute to basic understanding of nuclear weapons technology, stimulate new weapons concepts, and offer a means to explore the long-term potential of inertial fusion as an energy source. Key experiments in support of these objectives are now possible as long-awaited research facilities approach completion.

Experiments in the laboratory will be conducted with NOVA, ANTARES, and the Particle Beam Fusion Accelerator (PBFA) to learn the physics of efficient fuel compression. The inertial fusion program plan is to develop by 1987 a sufficient data base from the new, larger laser and particle beam facilities to project ignition requirements with confidence.

Recent accomplishments in the inertial fusion program have:

- o Demonstrated on the NOVETTE laser system developments in crystal array technology; split aperture, large disk amplifiers; and large optics finishing/coating technology for the NOVA facility.
- o Verified hohlraum physics scaling at 8 kilojoules with green light on NOVETTE.
- o Completed on NOVETTE experiments on the nonlocal thermonuclear equilibrium physics of resonant photo excitation x-ray laser concepts.
- o Conceived and demonstrated the induced spatial incoherence technique to achieve uniform laser illumination of targets.
- o Completed a systematic study of underdense plasma dynamics and stimulated Raman scattering in hohlraum experiments with green light at 150 joules.
- o Achieved +5 percent irradiation nonuniformity with a single infrared laser beam at 100 joules on a planar target.
- o Performed weapons physics experiments on HELIOS.
- o Completed construction of ANTARES on schedule and within cost.
- o Demonstrated laser operation of the krypton fluoride Large Aperture Module as a low-cost laser driver technology.
- o Achieved at subscale the microscopic divergence and steering error performance in ion beam focusing required for PBFA-II.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>OPERATING EXPENSES</u>	\$ 145,000	\$ 125,000

This funding level will permit continuation of laboratory efforts in glass laser experiments, continuation of pulse power activities, and complete the evaluation of CO₂ as a laser driver.

<u>Glass Laser Experiments</u>	\$ 69,800	\$ 65,700
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In FY 1985, the primary experimental capability in short wavelength laser interaction experiments will be the NOVA frequency-converted glass laser at the Lawrence Livermore National Laboratory. The NOVA laser, scheduled to begin operation in early FY 1985, will attain energy levels of 70 to 100 kilojoules and operate at the 1.06 micron, 0.53 micron, and 0.35 micron wavelengths. The FY 1985 request level will provide necessary funding for NOVA experiments. Target experiments on NOVA in FY 1985 will concentrate on hohlraum scaling at 50-80 kilojoules and radiation pulse shaping.

KMS Fusion will conduct a program in target fabrication and experiments including investigation of plasma-filling phenomena in hohlraums, thermal/superthermal energy transport in spherical targets, and broad-bandwidth control of plasma instabilities.

	FY 1984 Appropriation	FY 1985 Request
<u>Gas Laser Experiments</u>	\$ 43,400	\$ 30,505

The primary capability for gas laser experiments is the ANTARES carbon dioxide (CO₂) laser, which became operational in FY 1984. ANTARES will be used both to develop a data base to evaluate the utility of carbon dioxide lasers for inertial fusion applications and to conduct weapon physics experiments in support of the weapons program. The criteria for the CO₂ evaluation and the experimental approach were developed in FY 1983 based on HELIOS laser experiments and refined target concepts.

Carbon dioxide experiments will be concluded on ANTARES by mid-FY 1985, completing the CO₂ evaluation for laser fusion applications. This evaluation will be based on the 30 to 40 kilojoule long-wavelength laser-target interaction experiments conducted by this time with the priority on-target concepts and long-pulse, higher-energy scaling experiments. The remaining funds will be used to close out CO₂ laser activities and to reorient the gas laser fusion efforts to explore KrF gas lasers as a possible short wavelength laser technology for future applications.

<u>Pulsed Power Experiments</u>	\$ 21,200	\$ 19,800
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The primary capability in FY 1985 for pulsed power experiments will be the PBFA-I at Sandia National Laboratories. Unlike the laser systems, PBFA-I concentrates light ions on the target. Light ion beam fusion offers an efficient, cost-effective driver for inertial confinement fusion. PBFA-II is the only driver now being constructed that has enough energy to offer the potential of achieving ignition if other technical issues are resolved. Since the principal problem of light ion fusion is power concentration, the objective of pulsed power experiments is to generate and focus ion beams on targets.

Significant progress has been achieved in meeting the key parameters required for the operation of PBFA-II in early 1986. In preparation for the activation of PBFA-II, the thrust of Sandia's program is to conduct a series of experiments on PBFA-I with an Applied-B diode and a lithium ion source in conjunction with a set of proton focusing experiments designed to achieve power concentration in excess of 20 TW/cm². These experiments will emphasize target implosion physics and further refine the issues to be resolved by PBFA-II. Los Alamos National Laboratory will provide target design, fabrication, and diagnostics for the target experiments.

<u>Direct Drive</u>	\$ 8,800	\$ 8,245
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Direct drive of inertial fusion targets refers to a specific method whereby laser energy is directly incident on a target causing outward expansion of the outer target layers and a radial implosion. Experiments in this area are carried out on glass lasers. For FY 1985, target experiments at the major support laboratories will address these areas. The University of Rochester will use the OMEGA laser operating at 0.35 micron wavelength to evaluate short wavelength thermal smoothing and its dependence on energy transport, the control of laser uniformity on spherical targets, and short wavelength plasma instabilities. The Naval Research Laboratory will test on the PHAROS laser a new technique called Induced Spatial Incoherence to enhance symmetry of target irradiation.

<u>Supporting Research</u>	\$ 1,800	\$ 750
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Funds are requested to support small research projects, mainly outside of the national laboratories, which have the potential of making important contributions to the mainline fusion efforts. These projects are generally of a nonclassified nature and are conducted typically by universities or independent firms with unique capabilities

to pursue highly specialized research. Areas include development of advanced diagnostic equipment and materials, development of numerical techniques for computer codes, and highly specialized target fabrication techniques, as well as basic research to increase the understanding of the physics of laser/plasma interactions. It is important to note that these efforts provide an otherwise unavailable opportunity for the program to fully utilize the wide range of scientific talent residing at our universities, and is also the most effective method for training physicists and engineers for careers in inertial fusion research.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>CAPITAL EQUIPMENT</u>	\$ 11,800	\$ 9,500

The inertial fusion program requires advances in diagnostics as it progresses into higher energy regimes, shorter pulse lengths, and shorter frequencies. The accurate determination of the performance of targets is essential to developing a reliable data base for the programmatic decision.

Many target experiments require significant diagnostic development; conversely, diagnostic advances permit new, more complete target experiments. Advanced target designs are generating data requiring greater spatial, temporal, and spectral resolutions than ever before. The physics phenomena associated with laser target experiments occur in the subnanosecond time scales, submicron spatial regimes, and span temperature regimes ranging from tens of electron volts (x-ray laser experiments) to greater than 100 eV (hohlraum experiments). Tools must be developed to explore these parameters, both as an integrated picture and with time histories. This capability is particularly important as higher compressions are achieved, allowing the investigation of radiation symmetry, implosion symmetry, and compressed density.

After the data is recorded, analysis by computer must be performed to provide the information needed for subsequent experiments. The quality of the data and of the analysis is strongly dependent upon the availability of imaging, streak, and framing cameras; x-ray spectrometers; and computer analysis equipment.

In addition to equipment for recording the experimental results, the fabrication of the target pellets themselves is equipment-intensive. Higher quality targets; that is, targets closer to perfect spherical shapes and freer of burrs, are necessary if the inertial fusion technology is to continue to develop. Equipment planned for FY 1985 related to target fabrication includes a computer numerically controlled target surface analyzer, a noncontact measuring machine, a laser machining station ultrasonic grinder, various ultraprecise gauges for measuring pellets, terminals with improved graphics for target designers, and a new diamond turning machine. This funding for capital equipment is the level required to support the experimental program.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>CONSTRUCTION</u>	\$ 12,900	\$ 3,500

Construction funding of \$3,500,000 in FY 1985 is requested to complete funding for the PBFA-II facility at Sandia National Laboratories, Albuquerque, New Mexico. Completion of the facility will permit definitive experiments to determine the feasibility of pulse power driven inertial fusion. PBFA-II is designed to have the power and energy believed to be necessary to drive a target to ignition provided the requirements for concentration of the energy on the target can be met.

<u>Project Number</u>	<u>Title</u>	<u>TEC</u>	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>Prior-Year Project</u>				
81-D-101	Particle Beam Fusion Accelerator-II, SNL, Albuquerque, NM	\$45,650	\$12,900	\$3,500

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Inertial Confinement Fusion

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

1. Title and location of project: Particle Beam Fusion Accelerator-II (PBFA-II), Sandia National Laboratories, Albuquerque, New Mexico	2. Project No.: 81-D-101
3. Date A-E work initiated: 4th Qtr. FY 1979	5. Previous cost estimate: \$42,150 Date: 1/83
3a. Date physical construction starts: 2nd Qtr. FY 1981	6. Current cost estimate: \$ 48,150 Less amount for PE&O: 2,500 Net cost estimate: \$ 45,650 Date: 1/84
4. Date construction ends: 2nd Qtr. FY 1986	

7. Financial Schedule

<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1981	\$36,750	\$ 5,000	\$ 4,984	\$ 2,168
1982	0	20,000	20,016	2,289
1983	0	4,250	4,250	10,100
1984	5,400	12,900	12,900	3,076
1985	3,500	3,500	3,500	25,985
1986	0	0	0	2,032

8. Brief physical description of project

This project provides for the construction of the Particle Beam Fusion Accelerator-II (PBFA-II) and the necessary laboratory space required to support the expanded capability of the Particle Beam Fusion Program. The laboratory building consists of a 21,000-square-foot, high-bay area to house the accelerator and provide adequate maintenance and experimental staging area. The building also contains support facilities consisting of light laboratory space, restroom facilities, mechanical equipment rooms for conventional facility electrical distribution and HVAC systems and specialized liquid pumping systems for PBFA-II, a specialized maintenance area for refurbishing small accelerator components, and a shielded enclosure for the data acquisition/data processing system and the control/monitor center. The site work includes a parking lot, relocation of the perimeter fence, and paving streets within the complex. A new primary substation will be required to support the expanded capabilities. Water, sewer, natural gas, and underground power will be extended and/or relocated, as required.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Particle Beam Fusion Accelerator-II (PBFA-II),
Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 81-D-101

8. Brief physical description of project (contd.)

The PBFA-II accelerator will require expanded storage, transfer, and processing systems for liquid dielectrics; i.e., transformer oil and deionized water and various insulating gases (sulfur hexafluoride (SF_6), argon- SF_6 mixtures, etc.). The PBFA-II is physically configured similar to the existing PBFA-I. The accelerator consists of multiple, individual modules arranged in a radial configuration with a centrally located pellet chamber. Each module contains an energy storage unit; i.e., a Marx generator, a pulse forming/voltage conditioning section, and a power flow/front-end section. The multi-module accelerator is housed in a large, single-tank structure approximately 108 feet in diameter and 20 feet high. The tank is divided into three annular segments corresponding to the dielectric used. The outer-most annulus, approximately 18 feet wide, contains the energy storage components of each module using transformer oil as the dielectric. The second annulus, approximately 33 feet wide, contains the pulse forming/voltage conditioning components and utilizes deionized water as a combination insulating and energy storage medium. The central section of the accelerator contains a common power flow/front-end section insulated with a vacuum. Approximately 650,000 gallons of both transformer oil and deionized water will be required. The primary operating mode of PBFA-II will be 4.0 MV with a 40 ns wide pulse producing approximately 3.5 MJ of energy and a peak power of 100 TW into the load.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide an accelerator with increased power and energy capabilities to support the ICF Experimental Program. This phase of the Particle Beam Fusion Program is directed toward experiments on ignition scaling by heating and compressing pellets filled with deuterium-tritium (DT) fuel. The benefits that would be derived from the capability to perform DT fusion ignition scaling experiments with the PBFA-II would be principally in the area of studies for military applications, as well as fusion research directed at a potential long-range solution to U.S. energy needs.

The present program utilizes a pulsed power device called PBFA-I, which is capable of delivering up to one million joules of energy in a single 30-trillion-watt peak-power pulse. PBFA-II will provide approximately 3.5 million joules of energy in a 100-trillion-watt power pulse. The new high-bay laboratory building will house PBFA-II and all required support systems. PBFA-I will continue to operate in support of particle beam fusion research during construction of PBFA-II. PBFA-II will be based on power concentration technology, beam physics, target interaction studies, power conditioning, and reliability and performance data from investigations on existing accelerators, PBFA-I, and SUPERMITE.

Recent target design studies indicate that beam energies of approximately one-and-one-half-million joules and power levels of approximately 100 trillion watts will have to be coupled into the target to achieve the necessary conditions for pellet ignition. In addition, fusion power reactor systems studies show that pulse repetition rates of 1 to 10 pulses per second will be needed with high reliability and standoff distances of several meters between the beam injector and target. In order to satisfy the relevant criteria, several steps must be taken. Sandia has defined the critical steps and is pursuing a program which will permit one to address the questions sequentially. The next step planned for 1986 is to conduct experiments to obtain ignition scaling data to confirm theoretical predictions.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Particle Beam Fusion Accelerator-II (PBFA-II),
Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 81-D-101

9. Purpose, justification of need for, and scope of project (contd.)

The long-term motivation for the large national commitment to fusion research is for an inexhaustible source of energy from fusion power. The more immediate application of inertial confinement research is to national security. PBFA-II will permit the increased capability in accelerator power and energy and provide additional laboratory space for assembly, maintenance, and pulse power technology development to carry out this research.

FY 1985 construction funds (\$3,500,000) will be used to procure all front-end hardware inside the vacuum interface, labor to assemble the entire accelerator, and provide the support necessary to conduct all subsystem tests leading to the first multi-module shot in 1986.

10. Details of cost estimate a/

	Item Cost	Total Cost
a. Engineering design and inspection		\$ 5,300
b. Construction costs		12,840
(1) Improvements to land - roads, paved areas, fencing	\$ 630	
(2) Laboratory building (high-bay/low-bay)	6,700	
(3) Utilities - electrical, water, sewer, telephone, natural gas	600	
(4) Special facilities - oil and deionized water storage tanks, and procurement equipment ...	4,910	
c. Equipment - accelerator and instrumentation		26,200
d. Contingency at approximately 6.0% of above uncommitted funds excluding engineering design and inspection		1,310
Total estimated cost		\$ 45,650 d/

NOTE: This estimate was prepared by Sandia National Laboratories based on facility construction contract commitments as of June 1983 and the accelerator research/design team estimate made during January of 1983. PE&D funds were used to support these studies. Escalation plus New Mexico Gross Receipts Tax of 10 percent per year from January 1983 is included to the date of contract placement for each element of the project.

11. Method of performance

Design and inspection of the laboratory building will be on the basis of a negotiated fixed-fee contract placed on the basis of competency. Construction will be by lump-sum, fixed-price contract awarded by competitive bids. Design and inspection of the special equipment will be by Sandia National Laboratories personnel except for nonrecurring technical architect-engineer services above normal operating levels. Sandia National Laboratories will procure and install the accelerator and instrumentation components.

a/ Original project cost based on Title II design of the facilities and Title I design of PBFA-II.

b/ Excludes PE&D funding.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Particle Beam Fusion Accelerator-II (PBFA-II),
Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 81-D-101

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>Total</u>
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$ 4,457	\$ 10,100	\$ 3,076	\$ 25,985	\$ 2,032	\$ 45,650
(b) PE&D	2,500	0	0	0	0	2,500
(c) Expense Funded Equipment	0	0	0	0	0	0
(d) Inventories	100	100	1,000	2,000	600	3,800
Total facility costs	\$ 7,057	\$ 10,200	\$ 4,076	\$ 27,985	\$ 2,632	\$ 51,950
2. Other project funding						
(a) R&D necessary to complete construction	\$ 50	\$ 0	\$ 0	\$ 0	\$ 0	\$ 50
(b) Other project related funding	3,600	3,900	3,000	500	1,400	12,400
Total other project funding	\$ 3,650	\$ 3,900	\$ 3,000	\$ 500	\$ 1,400	\$ 12,450
Total project funding (items 1 & 2)	\$ 10,707	\$ 14,100	\$ 7,076	\$ 28,485	\$ 4,032	\$ 64,400
b. Other related funding requirements* (estimated life of project: 10 years)						
1. Facility operating costs						\$ 480
2. Programmatic operating expenses directly related to the accelerator						4,500
3. Capital equipment not related to construction, but related to the programmatic effort in the facility .						500
4. GPP or other construction related to programmatic effort in the facility						0
5. Other costs						0
Total other related annual funding requirements						\$ 5,480

* Operating expenses in FY 1987 dollars.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Particle Beam Fusion Accelerator-II (PBFA-II),
Sandia National Laboratories, Albuquerque, New Mexico

2. Project No.: 81-D-101

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Total facility

(a) Construction line item	\$ 45,650
(b) PE&D funds	2,500
(c) Accelerator spare parts and start-up expenses required to start accelerator characterization phase (to be procured with operating funds)	3,800

2. Other project funding

(a) R&D necessary to complete conceptual design was prepared by Sandia National Laboratories	50
(b) R&D funding to supplement Title II PE&D funds for the development of the accelerator	12,400

b. Total related funding requirements

1. Facility operating costs	480
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Utility, janitorial, and maintenance costs estimated at approximately \$10.00 per square foot annually.

2. Programmatic operating expenses directly related to the accelerator	4,500
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Salaries and supplies for approximately 15 people per year to support a two-shift, one-shot per day experimental program.

3. Capital equipment not related to construction, but related to the programmatic effort in the facility ...	500
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An estimate of the equipment requirements to maintain the annual programmatic effort.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>Production and Surveillance</u>	\$2,136,725	\$2,621,700
<u>OPERATING EXPENSES</u>	\$1,686,125 a/	\$1,947,900

Weapons production and surveillance activities involve the procurement of materials (exclusive of nuclear materials); fabrication and assembly of nuclear weapons and weapon components; stockpile maintenance; reliability assessment of the existing stockpile; and development of safe-secure transportation, field transportation, field training manual preparation, and facility standby/startup required to maintain the United States national defense posture as approved by the President.

Funding for the weapons production and surveillance operating expenses activities follows:

War reserve new production	\$ 999,725	\$1,204,900
Stockpile maintenance	195,400	215,900
Stockpile evaluation	174,600	177,900
Process development	88,300	103,400
Other costs	228,100	245,800
Total	\$1,686,125	\$1,947,900

The FY 1985 request also includes funding to support Federal personnel at a level of 665 full-time equivalents. These Federal personnel will be located at the following Department of Energy field offices:

	<u>Full-Time Equivalents</u>	
	<u>FY 1984</u>	<u>FY 1985</u>
Albuquerque Operations Office	624	624
Oak Ridge Operations Office	31	31
Savannah River Operations Office	10	10
Total FTE's	665	665

a/ Includes pending FY 1984 Supplemental appropriation request of \$20,400,000 for state sales/use taxes.

Also included in weapons production and surveillance operating expenses is \$14,455,000 for leasing the following major computer systems:

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Request</u>
<u>Bendix Plant, Kansas City, MO</u>		
Computer-aided design/computer-aided manufacturing production system	\$ 1,290	\$ 2,960
Large-scale central processor	800	2,300
Technical system replacement	0	1,000
<u>Rocky Flats Plant, Boulder, CO</u>		
General purpose computer system	470	0
Computer-aided design/computer-aided manufacturing expansion	830	830
<u>Mound Facility, Miamisburg, OH</u>		
Applications analysis computer	0	110
Shop floor computer system	145	0
Computer-aided engineering system	0	115
<u>Pantex Plant, Amarillo, TX</u>		
Factory management system	0	100
Computer-aided design/computer-aided manufacturing interactive graphics system	620	480
<u>Pinellas Plant, St. Petersburg, FL</u>		
Computer-aided design/computer-aided manufacturing systems and network	1,000	1,300
<u>Oak Ridge, Y-12 Plant, Oak Ridge, TN</u>		
Central computer upgrade	1,940	1,760
Computer-aided design/computer-aided manufacturing systems and network	1,600	3,500
Total	<u>\$ 8,695</u>	<u>\$14,455</u>

These computers are necessary to meet the production management, process control, and numerical control activities and for administrative information processing requirements at the plants.

More detailed comments by activity follow.

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Request</u>
<u>War reserve new production</u>	\$ 999,725	\$1,204,900

This subactivity includes costs incurred for procurement and/or manufacture of materials, piece parts, and assemblies required in the final assembly of warheads to be delivered to the Department of Defense in direct compliance with the Nuclear Weapons Stockpile Memorandum covering the budget period as well as future years and for production/process engineering required to support future weapons delivery.

After allowing for escalation of \$52,990,000, the FY 1985 request reflects a real growth of \$152,185,000 to finance the continuing growth in production workload associated with the many new and, by far, more sophisticated and complex weapon systems entering production during the FY 1983-FY 1989 time frame.

	FY 1984 Appropriation	FY 1985 Request
Stockpile maintenance	\$ 195,400	\$ 215,900

This subactivity includes funding required to maintain weapons and weapon components currently in this Nation's nuclear weapons war reserve stockpile and those to be delivered to the stockpile. Included are the costs associated with repairing nuclear weapons and significantly modifying or modernizing older nuclear weapons in the stockpile. Funding is also provided to procure, fabricate, and assemble material and piece parts into weapon components which will be used to replace like components having limited life, including special nuclear materials. The costs incurred to retire and disassemble nuclear weapons from the stockpile are also funded under this subactivity.

After allowing for escalation of \$9,500,000, the request reflects a real growth of \$11,000,000 over FY 1984. This real growth in funding is comprised of reductions in the cost of the Stockpile Improvement Program and indirect expenses amounting to about \$2,100,000 combined with: (1) an increase of \$4,600,000 to support new production, and (2) \$8,500,000 for maintenance and retirement of weapons in the existing stockpile account for the net increase in FY 1985.

Stockpile evaluation	\$ 174,600	\$ 177,900
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This subactivity provides the funding required to assure the high quality and reliability of nuclear weapons and components in the war reserve stockpile and those products to be delivered to the stockpile, and to continue that assurance through reliability assessments issued quarterly during the stockpile life of every nuclear weapon system.

The request includes escalation which accounts for \$7,820,000 of the net change between FY 1984 and FY 1985. The remaining change, a real decrease of about \$4,520,000, in the subactivity results from decreases in the support of new production more than offsetting increases in stockpile evaluation.

Process development	\$ 88,300	\$ 103,400
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This subactivity is directed toward (1) solving current problems and adequately supporting all current and planned production of new weapon components in Phase 3, (2) developing new processes aimed at improving the operations by reducing process time and/or reducing attrition of materials and improving process yields, and (3) developing process and production techniques required to support necessary advanced technologies in order to provide for an efficient transition of new technologies into Phase 3 development programs for future weapons as defined by the weapons design laboratories.

The increase of \$15,100,000 reflects an allowance for escalation which amounts to \$4,550,000. The remaining increase of \$10,550,000 is required to support the increasing levels of new production and to support the heavy weaponization effort for all the weapon systems in engineering development.

Process development costs are summarized below:

	FY 1984 Appropriation	FY 1985 Request
Development effort on materials and processes for pre-Phase 3 systems	\$ 15,600	\$ 16,300
Development effort on materials, processes, and components on Phase 3 and Phase 4 systems	32,500	38,800
Improvement of existing plant operations	40,200	48,300
Total Process Development	\$ 88,300	\$ 103,400

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
Other costs	\$ 228,100	\$ 245,800

This subactivity provides funding for those costs incurred in the weapons production complex that are not recognized as part of product costs. It includes (1) nuclear materials recycle and recovery activities, (2) field engineering and training activities, (3) secure transportation activities, (4) facilities startup and standby activities, and (5) other miscellaneous costs including changes in inventory balances.

A significant portion (\$142,600,000) of the total funds included in the Other Cost category is for nuclear material recycle and recovery activities conducted at Mound, Oak Ridge, Rocky Flats, and Savannah River weapon production facilities. Tritium is recovered at the Mound Facility, enriched uranium and or alloy are recovered at Oak Ridge, and plutonium is recovered at Rocky Flats. Savannah River purifies and enriches the special nuclear materials to design specifications. After allowing for escalation of \$6,270,000, funding for FY 1985 recycle and recovery activities will reflect a \$5,030,000 decrease from FY 1984 levels.

Also included within this subactivity are field engineering, training, technical, and administrative services provided to the Department of Defense and Department of Energy weapon production plants. FY 1985 costs are estimated to be \$4,400,000, an increase of \$200,000 over FY 1984 after \$200,000 of escalation is considered.

The secured transportation shipments of nuclear weapons, weapon components, and all "strategic" or "trigger" quantities of all Government-owned special nuclear materials are included in this subactivity. These costs include the salaries, fringe benefits, and travel expenses of Federal couriers along with the cost of contract air and rail shipments and the maintenance of Government-owned motor vehicles. FY 1985 costs are estimated to be \$33,500,000--\$2,100,000 over FY 1984. A net increase of \$1,475,000 is required for escalation. The remainder of the change, a \$625,000 increase, reflects a slight increase in transportation activities in FY 1985.

Facilities startup and standby costs are anticipated to be \$17,300,000 in FY 1985. This amounts to a \$1,840,000 increase over FY 1984 after escalation of \$760,800 is considered. The increase in this area reflects the full funding of the decontamination and dismantling of the SM building at the Mound Facility.

The Other Cost category also includes a \$25,000,000 inventory change in FY 1985, a real reduction of \$1,100,000 after escalation. This estimate is detailed in the following table:

<u>Inventory Category</u>	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
Common Use Stores	\$ 7,500	\$ 8,000
Special Reactor Materials--Boron 10	13,500	15,000
Other Special Materials--Gold, Silver, and Platinum	4,000	2,000
Total	\$ 25,000	\$ 25,000

The remaining \$23,000,000 in the Other Cost category is required to support the production workload. Included in this area are the costs of Federal program management, the maintenance of management information systems, SACNET operations and maintenance, site planning, and management and planning studies. The FY 1985 request represents about a \$300,000 increase over FY 1984 levels after \$1,000,000 of escalation is subtracted.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>CAPITAL EQUIPMENT</u>	\$ 106,400	\$ 134,400

The estimate for FY 1985 will provide funding (1) for acquisition of equipment to provide the necessary capability in the production complex to meet the heavy workload in the 1980's, (2) to continue the upgrading of safeguards and security capability, and (3) to slow the continuing deterioration of equipment in the production complex. The FY 1985 funding request is comprised of \$19,000,000 for the purchase of computers and \$115,400,000 for the acquisition of basic equipment which includes \$11,300,000 for safeguards-related transportation and communications equipment. The basic equipment funding request will enable the production complex to acquire additional equipment to increase the effectiveness and efficiencies of existing operations.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
Major computer equipment	\$ 9,700	\$ 19,000

The following table details the major computer items included for FY 1985:

Bendix Plant, Kansas City, MO

Shop floor data systems	\$ 1,200	\$ 2,500
Computer-aided design/computer-aided manufacturing production systems	0	7,800

Mound Facility, Miamisburg, OH

Computer-aided design/computer-aided manufacturing systems and network	2,300	1,900
Central computer upgrade	0	600

Pantex Plant, Amarillo, TX

Interactive graphics systems expansion	0	900
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Pinellas Plant, St. Petersburg, FL

Computer-aided design/computer-aided manufacturing systems and network	3,550	0
Unclassified computer system	0	750

Oak Ridge, Y-12 Plant, Oak Ridge, TN

Computer-aided design/computer-aided manufacturing systems and network	2,650	2,700
Timesharing system upgrade	0	600

Rocky Flats Plant, Golden, CO

Mass storage system	0	600
CYBER 172 upgrade	0	650
Total	\$ 9,700	\$ 19,000

These computers are required to support production management, for process and numerical control activities, and for administrative information processing in the weapons production complex.

Bendix Plant - Shop Floor Data Systems \$2,500

This item represents an expansion of existing distributed processing systems at the Kansas City Plant. These systems are required to upgrade the existing plantwide work-in-process reporting and support specific customized data collection needs in selected manufacturing areas. These systems will communicate with the General Purpose Computer System to exchange data required to interface with the higher level integrated plant systems, but they also will provide for unique collection and analysis of data required for improved shop floor management in each different department.

Gradual expansion of this concept to many individual plant departments appears to be a feasible and cost-effective approach to supporting the large number of input devices required to achieve workstation reporting while providing the flexibility to satisfy the specialized departmental needs for increasing efficiency. In addition to improved product tracking, substantial benefits will be realized in other automated systems related to inventory accounting and requirements planning. This approach will minimize impact of downtime of the central computing system, improve productivity and departmental efficiency, and provide improved levels of reliability, flexibility, and service to the factory floor.

Bendix Plant - Computer-Aided Design/Computer-Aided Manufacturing
Systems and Network \$7,800

This item represents (1) a replacement of the Computer-Aided Design/Computer-Aided Manufacturing Training System central processor and selected peripherals due to the age, technological inadequacies, and higher maintenance costs of the existing equipment; and (2) a separate mainframe computer, peripherals, and software to specifically support computer-aided design/computer-aided manufacturing data base management activities. Most interactive data base management systems require large amounts of central memory and perform numerous disk input/output operations. These activities must be separate from the use of large computer-aided design/computer-aided manufacturing related programs in order to be able to maintain adequate response times. It is projected that by FY 1985 the computer-aided design/computer-aided manufacturing data base will be large enough that a separate computer will be required to adequately handle it. In addition, this equipment will provide the hardware and software resources needed to interface the computer-aided design/computer-aided manufacturing systems to existing factory management data bases.

Mound Facility - Computer-Aided Design/Computer-Aided Manufacturing
Systems and Network \$1,900

This item will provide the necessary equipment and facilities for Mound to establish and expand the technology base required to achieve an automated production environment by the end of the decade. Technologies which will be expanded or introduced include interactive graphics; flexible automation techniques, automated material transfer systems, and microprocessor controlled processes; and factory management systems including material resource planning, scheduling, group technology, and process planning. The functional areas addressed in this item are: design/drafting, facility design, product test design/documentation, product and process engineering, numerically controlled parts programming, shop automation, factory management, and quality control.

Mound Facility - Central Computer Upgrade \$ 600

This item is an upgrade of the current IBM 3033N central computer system. This upgrade is required to keep pace with increasing workloads associated with the introduction of new weapon systems and expanded reporting requirements. In addition, the Mound Facility is advancing from a batch stand-alone environment to an integrated online information network coordinated by host-computer management systems. Mound's rapidly expanding online terminal network which supports online access to management, production information, and interactive computational processing, as well as interactive graphics, requires increased computer power to provide adequate response time and service levels.

Pantex Plant - Interactive Graphics Systems Expansion \$ 900

The proposed expansion of the interactive graphics systems at the Pantex Plant is required to support the total programmatic workload in the areas of numerical control tape preparation, tooling design, process design, standards, and quality assurance functions. It has been proven that implementation of interactive graphics systems capability for computer-aided design functions and computer-aided manufacturing functions offers productivity benefits four to six times the equivalent manual or batch computer assisted work levels. The total projection of current programmatic workload requirements indicates increasing workload in the FY 1983 through FY 1986 time frame with a continuing workload indefinitely. To meet the increased workload, it will be necessary to take one of two actions: (1) obtain more technology support of the load without increased personnel; or (2) obtain additional personnel as projected necessary to support the increased workload level. Alternative 2 would also entail obtaining necessary facilities to support the increased personnel level.

Pinellas Plant - Unclassified Computer System \$ 750

The Pinellas Plant central computer facility currently operates with one host processing system to handle both classified and unclassified data. In order to remove constraints placed on unclassified users, the Pinellas Plant plans to acquire a separate computer system for such purposes. The system will initially provide unclassified timesharing, and all new unclassified systems will be developed for application on this machine. Existing unclassified application systems will migrate to the new unclassified processor as major modifications are required rather than establishing a major conversion effort. A computer configuration equivalent to an IBM 4341-L2 is envisioned with a reasonable complement of peripheral devices.

Separation of classified and unclassified processing is expected to be a major step for integration with computer-aided design/computer-aided manufacturing plans at Pinellas as well as strengthening ADP security for those classified processes remaining on the separate configuration.

Y-12 Plant - Computer-Aided Design/Computer-Aided Manufacturing
Systems and Network \$2,700

This item will augment and complement existing interactive graphic capability at the Y-12 Plant. The design and process capability afforded by this item will become an integral part of Y-12 production activities. The ability to use these aids to design tooling for processes now requiring many iterations of trial and error will result in benefits far beyond those from a reduction in designers' time alone.

Y-12 Plant - Timesharing System Upgrade \$ 600

This item will upgrade an existing timesharing system by the addition of one central processing unit. Hardware and software will be acquired to interconnect the central processing unit to the Capital Assets Management Information System computer (a DEC 2060). The proposed equipment will increase the number of simultaneous end-users on the timesharing system by a factor of two.

The system supports the manufacturing divisions of the Y-12 Plant and provides access to classified manufacturing data. Due to the increase in production volume and complexity of the manufacturing and testing procedures, an upgrade of the timesharing system is required. Summaries and/or sections of the central plant data bases are transferred to the timesharing computer for use by production personnel.

Rocky Flats Plant - Mass Storage System \$ 600

This item will consist of a storage director/controller, a short-term disk storage medium, and a long-term high density archived storage medium. The mass storage system is required to handle the rapidly increasing requirements for online disk storage and the demand for rapid access to large volumes of archived records. The system will support both the central computing facility and the systems that support manufacturing operations.

FY 1985
Request

Rocky Flats Plant - CYBER 172 Upgrade \$ 650

This item will provide the means for expanding the existing interactive graphics system at the Rocky Flats Plant. The upgrade will permit expansion of the interactive graphics system into seven vital development areas.

	FY 1984 Appropriation	FY 1985 Request
Basic equipment	\$ 96,700	\$ 115,400

The FY 1985 request is aimed at slowing the rate of deterioration of the weapons production equipment base.

The transportation safeguards requirement totals \$11,300,000 for FY 1985. It consists of \$4,000,000 for safe and secure trailers to handle the increased workload over the next 5 years, \$2,850,000 for the upgrade of worn ATMX railcars, \$2,750,000 to maintain an effective secure communication system, and \$1,700,000 for the replacement of other operational equipment.

The FY 1985 request also includes \$10,000,000 to accelerate the acquisition of computer-aided and controlled machine tools. These resources will be utilized to acquire (1) automated production control equipment to improve production planning, process planning, and production support; (2) programmable machine tools to do various labor-intensive repetitive production, production testing, and inspection tasks; and (3) distributed control interfaces required to interface robots and numerically controlled machines to production control computers. The capabilities afforded by computer-aided manufacturing equipment are especially beneficial to a high technology business such as nuclear weapons development and production because of the flexibility and speed of processing the many design changes that occur. In addition, this flexibility provides a more efficient utilization of plant equipment. Since production is accomplished more in a batch mode than an assembly line mode, flexible automation and production planning should yield even larger productivity increases than currently predicted by our plants. The Department of Energy is currently expanding the capacity of production facilities to meet the workload forecasted for FY 1987. We are relying on computer-aided manufacturing to allow us to achieve this expansion in a cost-effective manner. The expected increases in labor productivity and product yields from computer-aided design/computer-aided manufacturing implementation reduce engineering and manufacturing direct and direct support labor. This translates to reduced operating costs and facility expansion. In addition, we are relying on computer-aided design/computer-aided manufacturing to negate the need for expansion of certain critical skills, such as tool designers, that are very difficult to obtain from the current labor market.

The remaining \$94,100,000 of basic equipment funding will slow the deterioration of the equipment base throughout the nuclear weapons production complex. Three appraisals of the weapons production complex have been conducted to determine the magnitude of the equipment deterioration problem, and these show a substantial accumulation of physically poor, technologically inadequate, and obsolete equipment. This condition was caused by the substantial underfunding of capital equipment in past years. These appraisals also show that the condition of equipment in the weapons production complex continues to deteriorate because of the continued underfunding of capital equipment.

	FY 1984 <u>Appropriation</u>	FY 1985 <u>Request</u>
CONSTRUCTION	\$ 344,200 a/	\$ 539,400

The FY 1985 request includes the following:

- Initial funding for facilities to support production of the warhead for the anti-submarine warfare/standoff weapon and a new tactical bomb - \$25,000,000.
- Funding to continue construction of PEACEKEEPER, Standard Missile-2, TRIDENT II, and stockpile improvement facilities - \$96,100,000.
- Initiation of three production support projects - \$14,800,000.
- Continuation or completion of prior-year projects - \$183,400,000.
- Construction of safeguards vaults, Y-12 Plant - \$3,100,000.
- Initiation of three safeguards and site security projects - \$4,700,000.
- Initiation of environmental improvements, Y-12 Plant - \$5,000,000.
- Restoration and maintenance of the capital asset base of the Production Complex - \$207,300,000.

Following is a table listing the construction items included in the FY 1985 request. Detailed description and justification information for each project is presented in the construction project data sheets.

<u>Project Number</u>	<u>Title</u>	<u>TEC</u>	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>New Projects</u>				
85-D-111	General plant projects, VL	\$ 32,200	\$ 0	\$ 32,200
85-D-112	Enriched uranium recovery improvements, Y-12 Plant	52,000	0	4,500
85-D-113	Power plant and steam distribution system, Pantex Plant	28,400	0	4,500
85-D-114	Safeguards vaults, Y-12 Plant	3,100	0	3,100
85-D-115	Renovate plutonium building utility systems, Rocky Flats	38,200	0	5,800
85-D-121	Air and water pollution control facilities, Y-12 Plant	29,000	0	5,000
85-D-122	Safeguards and site security upgrade, Mound	2,700	0	2,700
85-D-123	Safeguards and site security upgrade, Phase 1, Pantex	6,000	0	1,000
85-D-124	Safeguards and site security upgrade, Rocky Flats	3,400	0	1,000
85-D-125	Tactical bomb production facilities, VL	35,800	0	10,000
	Total new projects		\$ 0	\$ 69,800

a/ Includes pending FY 1984 Supplemental appropriation request of \$16,100,000 for safeguards and security upgrading and for environmental improvements.

<u>Project Number</u>	<u>Title</u>	<u>TEC</u>	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>Prior-Year Projects</u>				
84-D-111	General plant projects	\$ 23,000	\$ 23,000	\$ 0
84-D-112	TRIDENT II warhead production facilities, VL	134,500	19,300	60,700
84-D-113	Antisubmarine warfare/standoff weapon warhead production facilities, VL	97,000	0	15,000
84-D-114	Consolidated nonnuclear manufacturing facility, RF	45,200	24,100	21,100
84-D-115	Electrical system expansion, Pantex	14,600	1,500	10,000
84-D-117	Inert assembly and test facility, Pantex	13,200	1,500	11,700
84-D-118	High explosive subassembly facility, Pantex	57,000	7,000	40,000
84-D-119	Railroad track replacement and upgrade, Pantex	7,600	800	6,800
84-D-120	Explosive component test facility, Mound	21,300	3,100	16,900
84-D-121	Safeguards and site security upgrade, RF	21,200	10,000	11,200
84-D-124	Environmental improvements, Y-12 Plant	56,000	7,600 a/	21,400
84-D-211	Safeguards and site security upgrading, Y-12 Plant	63,000	7,500 a/	8,000
84-D-212	Safeguards and site security upgrade, Pinellas	3,700	1,000 a/	2,700
83-D-124	Standard Missile-2 (SM-2) warhead production facilities, VL	11,000	0	9,000
82-D-106	Weapons assembly facilities, Pantex	35,000	- 5,000	0
82-D-107	Utilities and equipment restoration, replacement, and upgrade, Phase 3, VL	967,000	185,000	175,100
82-D-108	Nuclear weapons stockpile improvement, VL	46,800	4,000	5,500
82-D-111	Interactive graphics system, VL	28,500	8,600	6,800
82-D-146	Weapons production and production support facilities, VL	70,900	14,200	10,000
81-D-115	MX warhead production facilities, VL	125,000	30,000	20,900
81-D-120	Control of effluents and pollutants, Y-12	7,800	1,000	1,400
79-7-o	Universal pilot plant, Pantex	20,400	0	15,400
	Total prior-year projects		344,200	469,600
	Total Production & Surveillance		\$344,200	\$539,400

a/ Reflects pending FY 1984 Supplemental appropriation request.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

3. Date A-E work initiated: 1st Qtr. FY 1985

5. Previous cost estimate: None
Date:

3a. Date physical construction starts: 1st Qtr. FY 1985

6. Current cost estimate: \$32,200
Date: 1/84

4. Date construction ends: 1st Qtr. FY 1988

7. Financial schedule

Costs

<u>Fiscal Year</u>	<u>Obligations</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>After FY 1985</u>
Prior to FY 1983	\$ 0	\$ 4,100	\$ 2,515	\$ 0	\$ 0
1983	16,300	3,200	5,700	5,700	1,700
1984	23,000	0	4,600	8,000	10,400
1985	32,200	0	0	10,400	21,800

8. Brief physical description of project

This project provides for general plant improvements involving minor new construction in the weapons production complex. The work to be performed will include such activities as construction of roads, utilities, minor structures, capital alterations and additions, and technical facilities required for the operation of weapons program installations.

A project of this type cannot be fully detailed in advance. The subprojects listed below are examples of items under consideration. In general, the estimated funding for each location and listed subprojects is preliminary in nature and primarily indicative of the size of the subproject and the relative magnitude of the requirements. It should be noted also that the continuing study of requirements will result in changes in scope of some of the subprojects. Other subprojects will be added with the necessary postponement of some of those now included, dependent upon conditions or situations not now apparent.

This project covers requirements of the weapons production complex, the Albuquerque Operations Office and its operating contractors, the Y-12 Plant (under the Oak Ridge Operations Office), and the Y-12 operating contractor.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project

A general plant project is necessary to meet new and changing program developments, to correct deficiencies, and for minor utility and road construction. Research developments and changes in technical program requirements frequently result in the need for altered or new construction items not previously anticipated. In the past, these changes have included additions to buildings to house new equipment for weapons production support functions; construction of new small buildings; extensions or modifications to utilities; and general area development.

The weapons production and surveillance general plant project estimate for FY 1985 of \$32,200,000 provides the level of effort essential to meet the existing programmatic requirements, requirements for maintenance and replacement due to the aging of the plants, and other capital facilities.

The following subprojects are examples of items of work which may be performed at the major locations covered under this project. These are grouped by location and under the following reason-of-need categories: (1) Health, Fire, and Safety; (2) Programmatic Needs; (3) Pollution Abatement; and (4) Other.

The preliminary estimate of FY 1985 requirements by major area is as follows:

Albuquerque Operations Office	\$21,700
Oak Ridge Operations Office	10,500
Total	\$32,200
<u>Albuquerque Operations Office - Weapons Production Complex</u>	<u>\$21,700</u>

(1) Health, Fire, and Safety

a. Fire station expansion, Pantex Plant \$ 600

Existing fire station will be modified to provide additional sleeping quarters, shower, and change room to accommodate additional firefighting personnel. The existing facilities are severely overcrowded and firefighting capability is being expanded to keep pace with new construction.

b. Shower addition, Rocky Flats Plant \$ 180

Transportable shower and locker facilities will be provided to accommodate construction contractors personnel working in areas where building rules require showering and clothing changes. Increased production and construction activities at the site have caused a severe overcrowding of available facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations	2. Project No.: 85-D-111
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9. Purpose, justification of need for, and scope of project (contd.)

c. Fire station addition, Rocky Flats Plant \$ 220

A single-story addition will be built on the existing fire station to provide sleeping quarters, restroom, and shower facilities for four female firefighters. A trailer being used as temporary quarters does not meet the standards for equal employment opportunity.

d. Upgrade plant warning system, Rocky Flats Plant \$ 200

An improved warning system will be built in two buildings which is needed to comply with Department of Energy (DOE) and OSHA requirements. The existing system is obsolete and plagued with frequent failures along with unavailability of repair parts.

e. Surveillance camera elevator, Rocky Flats Plant \$ 100

An electric-powered lift will be installed on an existing water tower to move a surveillance camera between ground level and its normal position atop the tower. The current practice of handling and rope hauling on existing catwalks is inefficient, and the camera is occasionally damaged.

f. Upgrade waste handling facility \$ 350

This project will improve the ventilation system and make nuclear safety improvements to process drains and tanks in order to eliminate unsatisfactory temporary protective measures such as plastic houses around equipment and additional temporary filter stages.

g. Overhead traffic control lights, Rocky Flats Plant \$ 200

Overhead traffic indicator lights will be installed to show incoming and outgoing drivers which lanes are open for use. Use of the roadway center lane is changed at certain times from inbound use to outbound use to accommodate traffic trends.

h. Perimeter road, Rocky Flats Plant \$ 830

A perimeter road will be built around the southeast part of the plant site to relieve traffic congestion at the east gate. This construction, recommended by a traffic consultant's study of the plant, is needed to accommodate increasing plant population and avoid increasing traffic accidents and pedestrian injury.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

i. Sample preparation laboratory, Rocky Flats Plant \$ 210

A modular laboratory will be procured and installed for use in preparation of environmental samples in which radioactivity is in the natural background range. There is no existing laboratory for this work which currently uses "borrowed" spaces as available. Recent workload increases have resulted in no available laboratory space to borrow.

j. Medical department filter, Rocky Flats Plant \$ 300

A separate filter plenum will be installed in the existing medical department facility where contaminated personnel may be examined. This construction would prevent potential spread of contamination to other people and to the environment.

k. Upgrade fire alarm system, Albuquerque \$ 120

The fire alarm system in service in the DOE Albuquerque Office complex is no longer compatible with the Kirtland Air Force Base fire detection and alarm system. The DOE office is within the Kirtland Air Force Base and relies on the Base for fire protection. A compatible fire alarm system will be installed in the DOE Office complex.

Subtotal - Health, Fire, and Safety \$ 3,310

(2) Programmatic Needs

a. Consolidate forming and laminating operations, Bendix Plant \$ 500

Demolition, installation of new walls and ceilings, modification of heating, ventilating and air-conditioning ductwork, and construction of equipment pits will be accomplished in relocating and consolidating vacuum forming and laminating operations. Consolidation and segregation of these two operations will improve productivity needed to meet projected workloads.

b. Valve production facility, Bendix Plant \$ 800

A new 17,000 square-foot space will be prepared in the existing building dedicated to machining, assembly, welding, and inspection of squib valves. Construction will include modifying heating, ventilating and air-conditioning systems, lighting, utilities, and constructing new walls. Existing equipment will be

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

relocated to the new valve production facility. Separate facilities are needed to achieve enhanced quality and schedule performance.

c. Upgrade encapsulation facility, Bendix Plant \$ 700

Approximately 5,500 square feet of the existing manufacturing building will be upgraded and rearranged for the Electrical Assembly Encapsulation Department. Antistatic flooring will be extended from an adjacent area, and process equipment will be relocated. Additional automated equipment, new walls, and ceiling modifications will be included. This upgrade is needed to meet increasingly stringent quality requirements for encapsulated electrical products.

d. Solvent recovery and coolant separation facility, Bendix Plant \$ 530

Two 5,000-gallon stainless steel tanks will be installed in concrete catch basins for storage of trichlorethylene and PCB contaminated liquids. Distillation and centrifuge equipment will be installed for processing solvents, coolants, and oils. This project will provide a cost savings in disposal of hazardous wastes by reducing shipping volumes and by enabling reuse of some solvents and oils.

e. Waste water treatment system, Bendix Plant \$ 450

A biological waste treating system will be built including an aerobic digester, controls, waste water storage tank, waste feed, tanks, and support equipment. This system will treat waste water from the polymer plant. Significant cost savings will be achieved by special treatment, which will eliminate hauling and disposal of organically contaminated waste water by biological treatment. The effluent from this plant will be drained to the sanitary sewer system.

f. Upgrade Standards and Gage Laboratory, Pinellas Plant \$ 520

New and upgraded laboratory space will be built with a separate area having an air-conditioning system controlled to 10°F. This space will be operated to ensure the accuracy of precision electrical, mechanical, and mass measurement equipment used in weapon component production.

g. Upgrade shelf life storage, Pinellas Plant \$ 310

A 50 percent increase (1,200 square feet) in storage capacity is required to hold present and future products being held on shelf life observation programs. This project will modify existing building space providing the necessary racks, shelves, desk and record space, and material handling aides in a secured area.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

h. Accelerator system upgrade, Pinellas Plant \$ 940

An existing ion accelerator used in target assessment studies is inadequate and will be replaced with a more powerful accelerator housed in a shielded building. Failure to provide this new capability will limit the plant's ability to resolve production and development problems and meet design laboratory requirements.

i. In-process container staging facility, Pantex Plant \$ 570

Changes in the workload and in methods of operation at the Pantex Plant require more handling and staging of partially assembled weapons components. To protect the surfaces of high explosive components and other parts during this handling, additional containers, pallets, and liners are required for in-process movements. This project will provide a 6,000-square-foot staging facility for in-process component containers which are needed to meet production schedules.

j. Material handling equipment facility, Pantex Plant \$ 500

A 3,000 square-foot building will be provided to store material handling equipment and to support maintenance activities, such as battery charging, for the material handling equipment. Existing equipment such as forklifts, gasoline tugs, semitrailers, and tractors must be kept in the primary nuclear weapon staging area for immediate response when movement of weapons or production materials is necessary.

k. Tritium process engineering laboratory, Mound Facility \$ 960

A new tritium process engineering laboratory will be built inside the existing tritium building for performing low-level tritium work as required in checking processes, developing and testing equipment, and the properties of materials. This laboratory is needed to test and proof new concepts prior to their introduction into newly authorized processes needed for new weapon production.

l. Renovate inspection equipment storage, Mound Facility \$ 270

Preparation of tool and gage storage areas, each about 200 square feet, will involve renovation of space in three separate buildings and installing shelving. Quality and production audits have shown a need for improved storage and equipment inventory control to reduce the cost of replacing or restoring equipment in unusable conditions. The planned storage facilities will help to alleviate existing control problems.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

m. Machine shop in-line inspection facility, Mound Facility \$ 300

A 1,000 square-foot building addition will be built to support existing inspection gaging activities associated with manufacturing weapons components. The existing facility will be inadequate in both size and technological capability by FY 1985.

n. Machine shop, Mound Facility \$ 970

A new 5,000 square-foot machine shop will be built outside the existing security island to alleviate congestion in the present secured area machine shop. Establishing an additional facility outside the secured area will permit use of newly hired personnel while awaiting clearance, will help improve delivery schedules, and will help reduce the machine shop work backlog.

o. Tritium removal and calibration laboratory, Mound Facility \$ 330

Construction will include two tritium processing hoods and associated laboratory equipment to be installed in an existing building. This laboratory is needed for evaluation of processes, equipment, and materials necessary to improve control and reduction of tritium effluents discharged to the environment.

p. Americium storage area, Rocky Flats Plant \$ 600

An americium tank vault will be modified to provide storage for concentrated americium oxide. Construction will include a shielded partition wall, storage racks, and a remote handling system. An interim storage area is needed to accommodate excess purified americium oxide that will accumulate at Rocky Flats after the end of FY 1983.

q. Salt preparation and purification facility, Rocky Flats Plant \$ 390

A new salt preparation and purification facility will be built to ensure that the quality of salt entering a process meets appropriate quality standards. Currently, salts are prepared in a metallurgical operations area on an as-needed basis and do not always meet the required specifications.

r. Liquid nitrogen piping system, Rocky Flats Plant \$ 170

A new cryogenic piping system will be installed to deliver liquid nitrogen from an existing nitrogen supply Dewar outside the production building. This will eliminate the use of smaller dewars, eliminate liquid nitrogen handling time, and reduce safety problems.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

s. Communications line extensions, Rocky Flats Plant \$ 500

Automatic data processing (ADP) terminals currently being installed in many of the plant's buildings will be joined by installation of coaxial cable in rigid conduit connecting each building with ADP terminals to the nearest computer controller. This is part of a plantwide effort to improve methods of recording, analyzing, and reporting information required to meet new production schedules.

t. Storage space, Rocky Flats Plant \$ 200

Approximately 6,000 square feet of space in an existing building will be prepared for storage and control of active and inactive war reserve (WR) production tools and gages. These WR production tools require separate storage in temperature and humidity controlled spaces. This construction will avoid recertification efforts, estimated at 2,000 man-hours per year, for equipment not controlled or stored in accordance with DOE requirements.

u. Pneumatic transfer system, Rocky Flats Plant \$ 500

A pneumatic transfer system will be built between the foundry building and the chemical analysis laboratory for rapid movement of plutonium metal samples. A large volume of samples is transported between these buildings. Each sample requires special handling in glove boxes, special packaging, and security guard accompaniment as the sample is hand-carried. The pneumatic system will speed the transfers, decrease personnel exposure, and improve manpower efficiency.

v. Hot isostatic press facility, Rocky Flats Plant \$ 890

A hot isostatic press will be purchased and a small building will be built to contain it. This new capability is needed at the Rocky Flats Plant for use in beryllium technology applications, for improving mechanical properties of material, for pressing special shapes, and for bonding dissimilar metals.

w. Process development facility, Rocky Flats Plant \$ 200

A temporary research and development facility used to develop photo resist techniques for application on new weapons systems will be replaced with larger, more suitable facilities. The temporary facility set up for development work on the W79 is not satisfactory for future workloads.

Subtotal - Programmatic Needs \$12,100

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

(3) Pollution Abatement

a. Waste incinerator, Pantex Plant \$ 700

A new incinerator will be built for destroying waste materials derived from high explosive production, such as material contaminated with high explosives and chemicals generated in explosive synthesis and related formulating processes. Stack scrubbers will be provided to capture particulates and noxious fumes. Currently, these materials are burned in open tanks and cage incinerators.

b. Fuel tank dikes, Mound Facility \$ 100

Existing dikes surrounding the fuel oil tank will be resurfaced with an oil resistant material. The existing asphalt dike will disintegrate on contact with fuel oil and permit the oil to seep into underlying soil and to the surface drainage which leads to the Great Miami River. This upgrading will reduce the probability of offsite pollution.

c. Process waste water storage tank, Rocky Flats Plant \$ 700

A 1.2 million gallon capacity tank will be built for storage of process water. The process waste water evaporator and spray dryer system is subject to shutdowns, both scheduled and unscheduled. During those periods waste water storage is required while repairs are made. Storage time may vary from weeks to months. Existing solar ponds currently used for this purpose are scheduled to be removed.

Subtotal - Pollution Abatement \$ 1,500

(4) Deteriorated Utilities

a. Water well, Pantex Plant \$ 500

A new water well will be drilled to replace one of four water supply wells in the plant's water system which produces water for domestic use and fire protection. The output of one well, put into operation about 40 years ago, is no longer reliable.

b. Replace air handler, Pinellas Plant \$ 520

Air handling units will be replaced as they reach the end of their useful life, as recommended in a 1981 study, in order to avoid production interruptions and to realize energy savings.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

c. Water plant control panel, Pinellas Plant \$ 90

A 13-year-old deionized water plant control panel will be replaced. The panel is becoming unreliable. A malfunction in the controls could disrupt production.

d. Argon recirculating system, Rocky Flats Plant \$ 360

An inert (nitrogen) atmosphere system used on glove boxes in the plutonium research and development building will be converted to argon, and an improved recirculating system will be installed. Moisture in the nitrogen system influences testing results, and nitrogen reacts with plutonium at high temperatures. The argon atmosphere is required in pyrochemical development activities.

e. New access road, Kansas City Plant \$ 730

A new asphalt paved access road will be built along the eastern boundary. Part of the existing road is preempted by a new building. Existing fencing and an abandoned railroad track will be demolished. Construction will include a new security fence, guardrails, lighting, concrete storm drains, and relocation of a railroad signal.

f. Replace condensate water strainer, Bendix Plant \$ 460

The 1/2-inch mesh condensate water strainer system in the boiler house cooling tower will be replaced with a new strainer system designed to remove particulates greater than 1/100-inch such as dirt, grass, and other particles which are not removed by the existing strainer. This will reduce the frequency of shutdowns for repairs and cleaning.

Subtotal - Deteriorated Utilities \$ 2,660

(5) Other

a. Cafeteria relocation, Bendix Plant \$ 900

An existing cafeteria annex will be relocated and expanded. A kitchen, storage area, serving area, and dining area will be built in an existing building to be vacated on completion of the new electrical products manufacturing building. The existing cafeteria annex is used at maximum capacity with no room for expansion. With completion of several new buildings at Bendix, there will be a significant shift of personnel away from the cafeteria, resulting in about half the allotted lunch period being used in travel.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

b. Security surveillance upgrade, Pinellas Plant \$ 180

Alarm detectors, closed circuit television monitors, and access control systems will be installed to increase security surveillance of the plant perimeter fence line and provide access control to exclusion areas.

c. Firing range improvements, Rocky Flats Plant \$ 280

The existing firing range used by plant protection personnel will be improved by installing new target systems and repairing or replacing deteriorating paving. The existing facility is not adequate for maintaining the firearms performance of security personnel. Residual water from rain or snowstorms renders half the range unuseable. The proposed construction will improve the utilization of the range.

d. Secured storage vault, Rocky Flats Plant \$ 530

A new secured package storage vault will be built to replace storage space previously available in an existing onsite tunnel. After a recent flooding incident, the tunnel has been declared unsuitable for further secured package storage. A new vault is essential to properly control stored radioactive material.

e. Library addition, Rocky Flats Plant \$ 240

A 2,400 square-foot addition to the Rocky Flats technical library will be built to accommodate the increasing volume of incoming technical literature and reports, to provide office space for the library staff, and study space for the library users.

Subtotal - Other \$ 2,130

Oak Ridge Operations Office, Y-12 Plant \$10,500

(1) Programmatic needs

a. Upgrade changehouse \$ 500

As a part of a continuing program to upgrade changehouses in the weapons production area, an additional changehouse will be upgraded to meet current standards for changehouses and to provide a barrier to contamination for the protection of the general public. The upgrade will include structural changes,

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

replacement of showers and piping, installation of shoebins, and rearrangement of lockers and clothesbins for additional storage space. This upgrade will help reduce the current track-out problem.

b. Reinforce arc melt floor \$ 300

Reinforcement of the floor in the vicinity of arc melting activities will be accomplished to provide greater load-bearing capacity needed to support lathe operations, product storage, and fork truck operations. Increased workload demands more activity and inventory in the area. Material handling problems caused by limited floor strength hamper ability to meet production requirements.

c. Expand computer facility \$ 500

The existing computer facility will be upgraded and enlarged to include work stations for computer-aided design and other development activities. An existing electronics laboratory will be relocated to provide space for computer facility expansion. The existing facility is overcrowded and excessively noisy. Maintenance space is inadequate, and additional space is needed for expanding computer-aided processes such as machine tool programming, process planning, and off-line robotic programming and simulation testing.

d. Building elevators renovation \$ 300

Two existing elevators will be modernized by replacing motors, hoists, electrical control switches, and cars. These elevators are inadequate for the current workload requiring transportation of materials and equipment to production areas. Improved efficiency and safety is needed in transporting materials and personnel.

e. Coal storage silo \$ 250

A 2,000-ton coal storage silo will be built at the Y-12 steam plant to maintain a 24-hour supply of dry coal. Wet coal being supplied to the steam plant's bunkers adheres to the coal transport equipment, interrupts coal transport to the boilers, and may cause boiler flame failure. Overtime personnel are required to control adhesion problems.

f. Brine system crosstie \$ 100

A 16-inch brine line will be installed to connect the refrigeration systems of two primary production buildings. Each building has an independent cooling system providing brine at 12°F to properly condition

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

the working environment. The crosstie will allow the refrigeration system of one building to serve both buildings during partial power failures, routine maintenance shutdowns, or unexpected equipment failures.

Subtotal - Programmatic needs \$ 1,950

(2) Pollution abatement

a. Radioactively contaminated and regulated waste facilities \$ 750

This project will provide for construction of a number of waste processing and waste disposal facilities needed in changes in Y-12 Plant waste disposal practices under several evolving regulations on disposal of radioactively contaminated and other regulated wastes. Construction will include improved burial sites, waste processing facilities, and ground water control at existing burial sites.

Subtotal - Pollution Abatement \$ 750

(3) Deteriorated utilities

a. Ventilation modifications \$ 100

An air-conditioning and humidity control system will be installed in the production control laboratory to reduce large variations in environmental conditions. The laboratory contains expensive instrumentation. The present environment is somewhat corrosive and affects test results and equipment life.

b. Steam reheat system upgrade \$ 400

The reheat system servicing metal preparation areas of a major production building will be replaced. Temperature control is no longer reliable due to leaks in coils and to deteriorated steam control thermostats and valves. Higher maintenance costs and more frequent production interruptions justify extensive improvements.

c. Waste holding basin \$ 400

A new waste holding basin will be built to accept gravity flow waste waters from the steam plant and the water demineralizer. Existing waste holding facilities (an abandoned cooling tower pond) are deteriorated and now permit acid wastes to seep into the ground. Underground utility lines will be severely damaged if this condition is not remedied promptly.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

d. Replace PCB filled transformers \$ 900

Seven PCB filled transformers which have exceeded their design life are in service, supplying power to weapons production activities, will be replaced. Major repairs to PCB transformers are forbidden by law. Violent failure of PCB filled transformers will result in environmental pollution.

e. Heating, ventilating, and air-conditioning \$ 380

Inadequate working conditions in one wing of an operating building will be corrected through modification of the existing ventilation system. Construction modifications in the building which added safeguards requirements has effectively cut off an operating area which is now scheduled to increase in activity to two shifts per day. Temperatures in excess of 100°F are experienced during the summer months. To correct the problem, improvements will include installation of cooling coils and associated piping and wiring.

f. Replace electrical cables \$ 500

This project will replace deteriorated electrical cables from the motor control center to the equipment in a production building. The insulation has deteriorated and caused the cables to short out. Efforts to repair such cables result in more damage because of the deteriorated insulation and, if other old cables in the same cable trays are disturbed in the process, these also begin to short out.

g. Replace steam and cooling coils \$ 900

This project will replace two steam coils and brine coils in three building heating, air-conditioning, and ventilation systems. The existing steam and brine coils in these buildings are old and have been repaired many times. This construction will reduce excessive outages and reduce high maintenance costs.

h. Replace 480-volt breakers \$ 900

Ten production feed electrical power breakers will be replaced under this project. At least 14 breakers at the Y-12 Plant are in poor condition due to age and must be replaced due to unavailability of spare parts. Failure of a breaker interrupts power to a production area as much as 48 hours.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

i. Replace steam and cooling coils \$ 800

New steam and cooling coils will be installed for two fans serving a machine shop. The existing coils are old and subject to failure with consequent loss of temperature control needed in the machine shop.

j. Replace cooling tower water lines \$ 500

Cooling tower water lines will be replaced between the tower and two manufacturing buildings served. The existing lines have deteriorated to the extent that any work on the lines is virtually impossible. Isolating valves will not close; hence, service to the buildings must be stopped when maintenance problems arise.

k. Replace sanitary sewer lines \$ 220

Sections of sanitary sewer lines in the east end of the Y-12 Plant will be replaced, dips and joints in lines will be repaired, manholes will be modified, and repairs will be made to exclude the entry of surface water from heavy rains. These repairs and improvements will reduce the potential for overflow of raw sewage and will reduce sewage treatment costs.

l. Replace creek conduit tiles \$ 600

This project will replace 54-inch diameter tiles in the underground conduit which conducts a creek beneath the Y-12 coal storage pile. Sections have collapsed in the past and have been replaced. Inspection during recent repair work reveals that deterioration extended to many other areas. Collapse and blockage of the conduit under the coal pile could disrupt steam plant operations.

Subtotal - Deteriorated Utilities \$ 6,600

(4) Other

a. Office space \$ 600

This project will provide office space for approximately 80 persons through renovation of old office space and modification of existing building space. FY 1985 production projections indicate a need for 80 additional office spaces to accommodate projected manpower increases over FY 1984 levels.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects,
various locations

2. Project No.: 85-D-111

9. Purpose, justification of need for, and scope of project (contd.)

b. Building siding \$ 400

Metal building siding will be applied to two buildings presently finished with asbestos shingles. The shingles are old and discolored with many broken and cracked shingles needing replacement. Matching replacements are no longer available. Application of metal siding will provide additional insulation and will lower maintenance costs (painting and shingle repair).

c. Portal improvements \$ 200

A road will be built to connect a parking lot to a second access street to reduce traffic congestion at a plant portal. Walkways will be built to provide pedestrian access to two administrative buildings from a parking lot. This project will improve an inefficient traffic flow situation.

Subtotal - Other \$ 1,200

10. Details of cost estimate

a. Engineering, design, and inspection	)	
b. Land and land rights	)	\$32,200
c. Construction costs	)	
d. Contingencies	)	
Total estimated cost		\$32,200

11. Method of performance

To the extent feasible, design and inspection will be performed under negotiated lump-sum architect-engineer contracts. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids. In some instances, it will be more economical or timely for design, inspection, procurement, or construction to be done by operating contractors and others already under contract to the Government.

12. Funding schedule of project funding and other related funding requirements

Not applicable.

13. Narrative explanation of total project funding and other related funding requirements

Not applicable.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Enriched uranium recovery improvements,
Y-12 Plant, Oak Ridge, Tennessee	2. Project No.: 85-D-112
3. Date A-E work initiated: 2nd Qtr. FY 1985	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 1st Qtr. FY 1986	6. Current cost estimate: \$52,000
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1989	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
100	1985	\$ 4,500	\$ 4,500	\$ 4,500	\$ 2,000
	1986	15,300	15,300	15,300	8,000
	1987	21,000	21,000	21,000	15,000
	1988	11,200	11,200	11,200	19,000
	1989	0	0	0	8,000

8. Brief physical description of project

This project will upgrade significant facets of the weapons program enriched uranium recovery facility, including process reliability, nuclear criticality safety, production capacity, special nuclear materials (SNM) safeguards, and uranium containment. Production scrap processing equipment will be provided to receive uranium-bearing waste from various sources throughout the plant, sort the material according to type, and then shred and compact the combustibles. A two-stage incinerator will be installed, complete with off-gas cleanup and ash removal accessories to burn the contaminated waste.

A series of new high-capacity leaching columns and tray dissolvers will leach uranium from the ash and other contaminated solids. A new secondary uranium processing operation will also be provided to recover virtually all residual uranium in the solids after the primary treatment is complete. New vertical storage tanks, low-temperature intermediate evaporators, and clarification equipment will be added to the main uranium flow line to allow control and removal of solids that currently interfere with the continuous uranyl nitrate purification operations. This will improve management of uranium flows and increase production rates.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements, Y-12 Plant, Oak Ridge, Tennessee	2. Project No.: 85-D-112

8. Brief physical description of project (contd.)

Major ventilation and humidity control equipment, including air dehumidifiers, fans, ducts, and exhaust stacks, as well as physical isolation of particularly "contaminated" processes will be provided to reduce the amount of airborne and surface uranium activity. The expanded use of glove boxes and hoods will be emphasized. A central control room will be provided for process monitoring and materials management.

A new contamination control facility will be provided to control uranium "trackout" from the operating area. This facility will feature physically distinct and well-defined clean/contaminated zones with a contaminated shoe park, shoe scuff, and laboratory coat storage area, personnel monitors, and hand wash station. A new decontamination facility will be provided to clean equipment removed from the production area for maintenance or disposal. This facility will feature both small and large disassembly and cleaning hoods with monorail cranes and liquid handling ancillaries such as pumps, filters, and storage tanks. A small building addition will be built on the control room to provide floorspace needed to accommodate control equipment.

The requested FY 1985 funding will be used for design of the project.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to upgrade existing enriched uranium recovery facilities to the level necessary to provide for continued reliable and safe operations, for protection of personnel and the environment, and for compliance with standards covering control and accountability of SNM. The existing facility was built more than 25 years ago using state-of-the-art technology. Now, most of the technology and equipment is old. Significant improvements are essential for safety in operations and for expected future production requirements. This project will provide significant improvements in the areas of: (1) criticality safety; (2) SNM accountability and safeguards; (3) personnel and environmental protection; and (4) production reliability and maintenance of capacity.

Function of enriched uranium recovery facilities

The Y-12 Plant is the primary source of highly enriched uranium (93% U-235) nuclear weapons components and subassemblies for the nuclear weapons stockpile of the United States. The enriched uranium for new production comes from the disassembly of obsolete weapons. Rough metal forms are first produced in a casting operation using graphite crucibles. Some of the cast metal is then rolled and hot formed. The resulting parts are ultimately machined to final dimensions. The manufacturing process produces a considerable quantity of uranium scrap as casting dross, metal turnings, contaminated graphite, and various contaminated residues. Impure uranium contained in this scrap is recovered in a unique chemical reprocessing facility for reintroduction into the weapons component production stream.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-112

9. Purpose, justification of need for, and scope of project (contd.)

The facility to be improved represents the only enriched uranium recovery capability of any size in the United States. Since there is currently no operational capability for converting material withdrawn from the gaseous diffusion plants to weapons grade metal, this recovery facility represents the only source of makeup material for new nuclear warheads. Furthermore, since impurities are stripped from the scrap uranium during chemical reprocessing, this recovery facility also serves to maintain the minimum overall purity and neutronic characteristics of the weapons uranium stockpile. The highly enriched uranium that is recovered from the production scrap every year is worth hundreds of millions of dollars. Thus, it is essential that the reliability of the Y-12 chemical recovery operation be maintained since economics and material availability and purity requirements demand that the uranium scrap generated during the production operations be reprocessed.

Reliability of operations and maintenance of capacity

The current chemical recovery facility was designed on the basis of technical and administrative standards and practices which were in effect over 25 years ago. The original process and equipment were well chosen and engineered at that time using what was then state-of-the-art technology. Most of the equipment in the facility today is the original equipment. It has seen very few alterations and technological improvements in the intervening years. The chemicals used in the various recovery processes are highly corrosive and, as a result, much of the equipment requires excessive maintenance. The use of automatic control instrumentation is very limited and the instruments used represent obsolete technology. Thus, the recovery facility is reaching the end of its useful life, and its ability to meet anticipated production requirements during the 1980's must be considered marginal.

Criticality safety

A very important concern with the adequacy of the present facilities deals with nuclear safety. In view of the severe consequences of an uncontrolled nuclear reaction, nuclear criticality safety is a major concern in all enriched uranium operations and, in particular, those involving large quantities of uranium bearing solutions. Strict administrative controls are one of the major tools used at Y-12 to assure nuclear criticality safety. As the equipment continues to age and deteriorate, the number of incidents requiring actions by process operators will increase. Also, undetected leaks or other problems which could result in a criticality incident are more likely to occur. Upgrading of current facilities is necessary to increase the integrity of pipes and processing equipment, replace batch processing with continuous processing, increase the use of geometrically safety equipment, add process control and monitoring instrumentation, and reduce the need for opening of storage tanks for cleaning. All of these upgrading actions will serve to reduce reliance on administrative control and significantly reduce the risk of incurring a criticality incident.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-112

9. Purpose, justification of need for, and scope of project (contd.)

Nuclear materials control accountability

Current equipment configurations, instrumentation, and some elements of process capability are inadequate to measure the enriched uranium inventory to the degree of precision required by current accountability and safeguards criteria. Significant uncertainties in inventory are inherent due to the fact that uranium solutions are stored in a number of small diameter horizontal tanks whose level cannot be accurately determined, and it is very difficult to obtain a representative sample. A small error in determining the level of solution in storage tanks or a non-representative sample results in a sizeable inventory difference.

Another area of uncertainty and delay in accounting for enriched uranium on a monthly basis is in determining the uranium content of various types of residues. Facilities improvements are required to provide additional capability for processing residues to a measurable form in a timely manner, thereby minimizing the backlog of residues.

As the equipment continues to age and deteriorate, there is an increasing potential for major losses of enriched uranium due to leaks and other problems. With the current equipment and technology, early detection of such problems may not be possible.

Personnel and environmental protection

Continued operation of existing facilities is of major concern from the standpoint of protection of personnel and the environment. While current standards are being met, personnel exposures and effluent releases have in some cases been higher-than-desired levels and generally show upward trends. This is due in part to increased production throughput, but the major cause is the age and condition of the equipment and the need for more and more maintenance which greatly increases the potential for uranium releases.

Deficiencies in ventilation systems, decontamination facilities, and process equipment containment are such that the facility as a whole does not provide an adequate margin of safety necessary to maintain a good health physics environment. With continued deterioration of the equipment, there is a possibility that it will not be possible to meet personnel and environmental protection standards through the use of operating controls and limitations. More stringent standards are highly likely in the near future which will further increase the difficulty of compliance.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-112

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 21% of construction costs, item b		\$ 7,500
b. Construction costs		35,600
(1) Building addition, approximately 1,200 square feet at about \$165 per square foot	\$ 200	
(2) Construction staging building, approximately 5,000 square feet at about \$120 per square foot	600	
(3) Special process facilities for uranium recovery processes	34,800	
	Subtotal	43,100
c. Contingency at approximately 20% of above costs		8,900 b/
	Total estimated cost	\$52,000

11. Method of performance

To the extent feasible, design will be accomplished on the basis of a negotiated architect-engineer contract. Inspection will be performed by the operating contractor. Construction, installation, and procurement will be accomplished by the cost-plus-award-fee contractor and the operating contractor.

Project implementation must be structured to ensure continuity of existing production operations, maintenance of the SNM safeguards and accountability capability, and the preservation of criticality, personnel, and environmental safety.

a/ Estimate is based on a completed conceptual design.

b/ Contingency applies to work to be accomplished during FY 1985, FY 1986, FY 1987, FY 1988, and FY 1989.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-112

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	Total
a. Total project funding							
1. Total facility costs							
(a) Construction line item	\$ 0	\$2,000	\$8,000	\$15,000	\$19,000	\$ 8,000	\$52,000
Total facility costs	0	2,000	8,000	15,000	19,000	8,000	52,000
2. Other project funding							
(a) Conceptual design	663	0	0	0	0	0	663
(b) Process development effort	2,675	0	0	0	0	0	2,675
Total other project funding	3,338	0	0	0	0	0	3,338
Total project funding (items 1 and 2)	\$ 3,338	\$2,000	\$8,000	\$15,000	\$19,000	\$ 8,000	\$55,338
b. Other related funding requirements (estimated life of project: 20 years)							
1. Facility operating costs							\$ 1,300
2. Programmatic operating expenses directly related to the facility							3,050
Total other related annual funding requirements							4,350

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other related project funding

- Conceptual design for this project has been completed at a cost of \$663,000.
- Process development effort necessary to establish the parameters and criteria for design of this project will be completed prior to FY 1985 by the operating contractor at a cost of \$2,675,000. The work includes investigation of an alternative residue treatment process and extraction column controls. This development effort, as presently scheduled, will not constrain the construction of this project. Attractive, alternative technologies have been identified in several cases which offer the potential for large incremental performance gains over the base design. The unique application of these processes and systems to uranium recovery involve technical uncertainties which will be assessed prior to start of project design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium recovery improvements, Y-12 Plant, Oak Ridge, Tennessee	2. Project No.: 85-D-112
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13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Other related funding requirements

1. Facility operating costs

Annual facility operating costs include utilities, maintenance, janitorial services, and related overhead.

2. Programmatic operating expenses

Operating expenses directly related to the new facility will cover direct labor, material, supplies, and related overhead.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Power plant and steam distribution system, Pantex Plant, Amarillo, Texas	2. Project No.: 85-D-113
3. Date A-E work initiated: 3rd Qtr. FY 1981	5. Previous cost estimate: None Date:
3a. Date physical construction starts: 1st Qtr. FY 1985	6. Current cost estimate: \$30,400 Less Design Funding: 2,000 a/ \$28,400
4. Date construction ends: 1st Qtr. FY 1990	Date: 1/84

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 4,500	\$ 4,500	\$ 4,500	\$ 2,200
1986	23,900	23,900	23,900	10,200
1987	0	0	0	10,800
1988	0	0	0	2,300
1989	0	0	0	2,000
1990	0	0	0	900

8. Brief physical description of project

This project provides for the construction of a new central power plant equipped for the cogeneration of electric power and a new steam distribution system.

The new power plant will be designed for natural gas as the primary fuel and will provide for conversion to coal at a later date as conditions warrant. Current availability of natural gas in the Amarillo area and overall life cycle cost evaluation strongly favors natural gas as the primary fuel. A 600,000-gallon supply of reserve fuel oil is presently available at Pantex for emergency boiler fuel. Boilers will be designed to accommodate later conversion to coal use, but no equipment for firing coal is included in this project.

a/ A significant part of the design for this project will have been completed by the start of FY 1985 using FY 1981 and FY 1982 funding provided by the Department of Energy (DOE) In-House Energy Management Program.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Power plant and steam distribution system, Pantex Plant, Amarillo, Texas	2. Project No.: 85-D-113
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8. Brief physical description of project (contd.)

The boiler plant will house three high pressure steam boilers, each rated at 40,000 pounds per hour, and two turbine generators, each rated at 1440 KWe. The plant will be centrally located between major heating and cooling loads on the site. The power plant building will be approximately 114 feet by 125 feet, with a 140-foot-high stack. The building will be a steel frame structure with insulated metal siding walls. The turbine hall will include an overhead crane for servicing.

Electric power will be produced in the plant at 12,470 volts and will be connected to the primary power distribution system serving the plant. Oil circuit breakers will be installed between the generators and the primary distribution system.

An existing aboveground steam distribution system will be dismantled, and steam piping and heating equipment in existing buildings will be removed. A new underground steam distribution system for 300°F steam will be built. Approximately 42,000 feet of insulated steam pipe will be installed with necessary manholes, valves, and building connections.

Provisions will be made for demineralizing and treating water from an existing well. A water storage tank will be built. The existing sanitary sewer will be extended to the power plant site.

Design of this project was begun and substantial progress made using FY 1981 and FY 1982 funds provided by the Department of Energy (DOE) In-House Energy Management Program. Design of the steam distribution system is scheduled for completion in FY 1984, and design of the power plant is scheduled for completion in FY 1985. The requested FY 1985 funding will be used for design and minor construction.

9. Purpose, justification of need for, and scope of project

Reliability is the primary and overriding factor which justifies immediate funding for this project. Pantex weapon production requires steam for continued operation; failure of the steam plant or distribution system could shut down production activities for as much as 6 months. Design of the project is in progress. The requested FY 1985 and subsequent year funding will permit completion of a reliable system late in 1990.

The existing Pantex steam plant and steam distribution systems are overaged, inefficient, and of seriously questionable reliability. The boiler plant, built in the 1940's under wartime limitations, has long exceeded the 25-year expected service life. Replacement parts are often not available and require custom manufacturing with delays of several months. Failure of this plant could result in a shutdown of Pantex weapon production activities that could last several months. Up to 72 percent of the steam energy produced in the boilers is lost due to inefficiencies and condensate losses in the steam distribution system.

The inefficiency in the steam distribution system is the result of a gradual shift in the manufacturing of high explosive (HE) components for nuclear weapons. In early years, most of the HE parts were formed by casting after the HE had been melted by exposure to steam. The large amounts of steam needed were transmitted in 18-inch pipelines. Condensate from

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Power plant and steam distribution system,
Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-113

9. Purpose, justification of need for, and scope of project

this operation was, in most cases, not suitable for reuse because of HE contamination. Condensate return lines were not provided from areas where the quality of the condensate was questionable.

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10. Details of cost estimate a/

	<u>Item cost</u>	<u>Total cost</u>
a. Engineering, design, and inspection at approximately 11% of construction costs, item b		\$ 2,270 <u>b/</u>
b. Construction costs		21,150
(1) Improvements to land	\$ 350	
(2) Buildings, including boiler house	3,700	
(3) Special facilities, including boiler and cogeneration systems	9,200	
(4) Utilities, including steam distribution system	7,900	
c. Removal cost less salvage (old steam lines)		1,200
	Subtotal	<u>24,620</u>
d. Contingency at 15% of above costs		3,780 <u>c/</u>
	Total estimated cost	\$28,400

a/ Based upon essentially completed design of steam distribution system and partially completed design of steam plant.

b/ Excludes \$2,000,000 provided by DOE In-House Energy Management Program in prior years for pre-Title I studies and partial design of this project.

c/ Contingency applies to work to be accomplished during FY 1985, FY 1986, FY 1987, FY 1988, FY 1989, and FY 1990.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Power plant and steam distribution system, Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-113

11. Method of performance

Design and inspection will be performed under a negotiated architect-engineer contract. Construction will be accomplished by a fixed-price contract awarded on the basis of competitive bids. Procurement support and relocation of existing equipment will be performed by the operating contractor.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	Total
a. Total project funding								
1. Total facility costs								
(a) Construction line item	\$ 0	\$ 2,200	\$ 10,200	\$ 10,800	\$ 2,300	\$ 2,000	\$ 900	\$28,400
(b) Partial design	2,000	0	0	0	0	0	0	2,000
Total facility costs	2,000	2,200	10,200	10,800	2,300	2,000	900	30,400
2. Other project funding								
(a) Conceptual design costs	35	0	0	0	0	0	0	35
Total other project funding	35	0	0	0	0	0	0	35
Total project funding (items 1 and 2)	\$ 2,035	\$ 2,200	\$ 10,200	\$ 10,800	\$ 2,300	\$ 2,000	\$ 900	\$30,435
b. Other related funding requirements (estimated life of project: 25 years)								
1. Facility operating costs								\$ 2,800
2. Programmatic operating expenses directly related to the facility								0
Total other related costs								\$ 2,800

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

Conceptual design for this project was prepared by the operating contractor at a cost of \$35,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Power plant and steam distribution system,
Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-113

13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Other related funding requirements

It is estimated that the programmatic life of this project is 25 years.

1. Facility operating costs

Facility operating costs of \$2,800,000 annually includes the cost of operating labor, equipment maintenance, supplies, and fuel. The approximate fuel cost is \$2,440,000 per year.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Safeguards vaults, Y-12 Plant,
Oak Ridge, Tennessee	2. Project No.: 85-D-114
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 4th Qtr. FY 1985	6. Current cost estimate: \$3,100
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1987	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
85	1985	\$3,100	\$3,100	\$3,100	\$ 900
86	1986	0	0	0	1,200
87	1987	0	0	0	1,000

8. Brief physical description of project

This project will upgrade physical security for special nuclear material (SNM) at the Y-12 Plant. Two storage vaults will be built adjacent to existing buildings to serve the enriched uranium casting area and the enriched uranium production area. These vaults will be prepared for storage of in-process SNM parts and materials. Construction will include a 3,500-square-foot building, a 3,000-square-foot building, a 450-foot section of asphalt road, modifications to an existing storm sewer, and removal of an abandoned storm sewer at one building site.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to improve protection of in-process SNM from external and internal threats of theft and diversion. Within the Y-12 plant secured area, there are large quantities of enriched uranium materials in process and in storage in nine material access locations. One major method of preventing diversion of SNM is to limit the number of personnel who have physical access to the material. These vaults will provide consolidated storage for in-process inventories which will restrict access to the material.

The protection of the large quantities of attractive material at the Y-12 Plant is the objective of the safeguards program. Safeguards and security inspection teams from Department of Energy (DOE) Headquarters and from one of the National Laboratories have recognized that these vaults are needed to maintain the safeguards posture defined in DOE Order 5632.2.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards vaults, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 85-D-114

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and construction at approximately 20% of construction costs, item b		\$ 410
b. Construction costs		2,290
(1) Improvements to land, including grading, drainage, diversion, fencing, and access	\$ 140	
(2) Buildings, approximately 6,500 square feet at approximately \$215 per square foot	1,400	
(3) Special facilities	610	
(4) Utilities, including electrical power, water, and steam	140	
	Subtotal	2,700
c. Contingency at approximately 15% of above costs		400 b/
	Total project cost	\$ 3,100

11. Method of performance

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

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 0	\$ 900	\$ 1,200	\$ 1,000	\$ 3,100
Total facility costs	0	900	1,200	1,000	3,100
2. Other project funding					
(a) Conceptual design costs	50	0	0	0	50
Total other project funding .	50	0	0	0	50
Total project funding (items 1 and 2)	\$ 50	\$ 900	\$ 1,200	\$ 1,000	\$ 3,150

a/ Based upon completed conceptual design.

b/ Contingency applies to work to be performed during FY 1985, FY 1986, and FY 1987.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards vaults, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 85-D-114

12. Funding schedule of project funding and other related funding requirements (contd.)

b. Other related funding requirements (estimated life of project: 15 years)

1. Facility operating costs	\$ 300
2. Programmatic operating expenses directly related to the facility	0
Total other related costs	\$ 300

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project funding

Conceptual design cost for this project was completed by the operating contractor at a cost of \$50,000.

b. Other related funding requirements

It is estimated that the programmatic life of this project will be 15 years.

1. Facility operating costs

Facility operating costs of \$300,000 includes direct labor, fringe benefits, maintenance and utility costs, and overhead.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Renovate plutonium building utility systems,
Rocky Flats Plant, Golden, Colorado	2. Project No.: 85-D-115
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 3rd Qtr. FY 1986	6. Current cost estimate: \$38,200
Date: 1/84
4. Date construction ends: 2nd Qtr. FY 1989	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 5,800	\$ 5,800	\$ 5,800	\$ 2,700
1986	21,600	21,600	21,600	10,200
1987	5,100	5,100	5,100	11,600
1988	5,100	5,100	5,100	11,400
1989	600	600	600	2,300

8. Brief physical description of project

This project will renovate or replace extensively deteriorated and obsolete utility equipment in the original plutonium processing complex, which consists of three buildings--the Plutonium Recovery Facility building, the Nuclear Waste Packaging building, and the Waste Treatment Plant building.

In the Plutonium Recovery Facility building, modifications will be made to the contaminated ventilation system including addition of fans, motors, controls, fire alarms, fire suppression systems, and replacement of existing air handling equipment. The main exhaust plenum will be renovated in the following manner. A stainless steel liner will be installed inside the existing concrete plenum chamber. The stainless steel plenum will be partitioned into three separate sections fitted to a common manifold. Each section will have air-handling capacity of approximately 125,000 cubic feet per minute. Two existing airlocks will be modified and a new central airlock added. Breathing air stations and communications equipment will be provided for each airlock. The first stage filter frames will be replaced. Existing pipe chases will be isolated from the plenum interior by stainless steel sheet metal enclosures. Air flow measurement equipment will be installed and inlet environmental monitoring instrumentation will be installed to measure moisture content, hydrogen fluoride, and nitrous oxide gases. Fire protection conduit and piping and lighting will be relocated. Five main exhaust fan motors and controls

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Renovate plutonium building utility systems,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 85-D-115

8. Brief physical description of project (contd.)

will be replaced. The existing exhaust tunnel and stack will be modified or replaced. The main trunk exhaust duct will be replaced. Parts of the existing room air and glove box exhaust air ducting system will be replaced. The modifications to be completed on the Plutonium Recovery Building will include replacing two substation transformers, increasing the capacity of the existing uninterruptible power supply, and replacing control systems on the exit heating, ventilating, and air-conditioning (HVAC) system. A new HVAC manifolded supply system will be installed. The compressed air system, steam distribution system, cooling water system, and sanitary and process drain vent filters will be modified.

In the Nuclear Waste Packaging Facility building, the existing air supply and exhaust systems will be renovated. An additional filter stage will be installed. New heat coils will be installed in the air supply system and air conditioning will be provided.

22 In the Waste Treatment Plant building, heating coils in the existing air supply system will be replaced and controls on the air
12 exhaust system will be replaced.
(2)

The requested FY 1985 funding will be used for design of the necessary facility modifications and will more adequately define the scope of work and cost of this project.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to modify existing utility systems within the three-building plutonium processing complex to achieve a safe, dependable operating condition necessary to support continued use of these buildings in the future. The decision to upgrade these buildings is based on the Rocky Flats Long-Range Study which shows that the buildings are structurally adequate and can be renovated more economically than constructing new facilities.

An in-depth review of the current and projected use for the complex indicates that these facilities must continue in operation to support future workload projections. The facilities are approximately 30 years old, extensively deteriorated, and have been damaged by continuous service under corrosive conditions. Current projections show that the old Plutonium Recovery Facility will need to remain totally operational until about 1998 to handle processing not scheduled for transfer to the new Plutonium Waste Recovery Facility.

The main exhaust plenum in the Plutonium Recovery Facility building has been subjected to highly corrosive acid fumes for 30 years and to a fire in 1957 which extensively damaged the first stage filter frames. Concrete subjected to acid fumes has lost its strength and has begun to crumble. The first stage filter frames were badly warped in the 1957 fire and, although repaired, are of inferior quality. Leaks in pipe chase liners could provide a direct bypass of both filter stages. While no leaks are known to exist, the liners are extensively corroded. Plutonium emissions, although well within safety limits, have shown an upward trend over recent years.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Renovate plutonium building utility systems,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 85-D-115

9. Purpose, justification of need for, and scope of project (contd.)

This project would correct all known deficiencies in the utility systems. An additional stage of filtration will be added to meet health, safety, and environmental requirements. Significant improvements in operations and maintenance are expected as a result of this project.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 16% of construction costs, item b		\$ 3,900
b. Construction costs		23,600
(1) Removal of existing equipment	\$ 6,500	
(2) Procurement and installation of new equipment	17,100	
c. Standard equipment		2,400
	Subtotal	29,900
d. Contingency at 28% of above costs		8,300 b/
	Total estimated cost	\$38,200

11. Method of performance

Design will be performed under a negotiated architect-engineer contract. Construction will be performed by an onsite contractor under an existing cost-plus-fixed-fee contract. Inspection of construction and procurement will be performed by the operating contractor.

a/ Based upon completed conceptual design.

b/ Contingency applies to work to be performed during FY 1985, FY 1986, FY 1987, FY 1988, and FY 1989. A relatively high contingency is required to cover unanticipated costs associated with unknown contamination in the existing process facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Renovate plutonium building utility systems
Rocky Flats Plant, Golden, Colorado

2. Project No.: 85-D-115

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	Total
a. Total project funding							
1. Total facility costs							
(a) Construction line item	\$ 0	\$ 2,700	\$ 10,200	\$ 11,600	\$ 11,400	\$ 2,300	\$ 38,200
Total facility costs	0	2,700	10,200	11,600	11,400	2,300	38,200
2. Other project funding							
(a) Conceptual design costs	40	0	0	0	0	0	40
(b) Radiation monitoring	0	0	200	300	300	200	1,000
Total other project funding	40	0	200	300	300	200	1,040
Total project funding (items 1 and 2)	\$ 40	\$ 2,700	\$ 10,400	\$ 11,900	\$ 11,700	\$ 2,500	\$ 39,240
b. Other related funding requirements (estimated life of project: 20 years)							
1. Facility operating costs							\$ 3,800
2. Programmatic operating expenses directly related to the facility							0
Total other related costs							\$ 3,800

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Conceptual design

Conceptual design for this project was prepared by the operating contractor at a cost of \$40,000.

2. Radiation monitoring

The operating contractor will provide the necessary manpower equipment and material during construction to perform all radiation safety monitoring, to perform the necessary decontamination as the work progresses, and to prepare required safety analysis reports after construction is completed. The total estimated cost of this work is estimated to be \$1,000,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Renovate plutonium building utility systems, Rocky Flats Plant, Golden, Colorado	2. Project No.: 85-D-115
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13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Other related funding requirements

The estimated useful life of this project is 20 years.

1. Facility operating costs

The projected facility operating costs for the proposed construction is \$3,800,000 per year. This includes maintenance, labor, materials and supplies, plus janitorial and utility services.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance

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

1. Title and location of project: Air and water pollution control facilities,
Y-12 Plant, Oak Ridge, Tennessee	2. Project No.: 85-D-121
3. Date A-E work initiated: 3rd Qtr. FY 1985	5. Previous cost estimate: N/A
Date: N/A
3a. Date physical construction starts: 4th Qtr. FY 1985	6. Current cost estimate: \$29,000
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1988	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
23	1985	\$ 5,000	\$ 5,000	\$ 5,000	\$ 1,500
23	1986	14,000	14,000	14,000	6,200
23	1987	10,000	10,000	10,000	12,100
	1988	0	0	0	9,200

8. Brief physical description of project

This project will provide new facilities for the control and disposal of mercury and for the modification of existing facilities to control gaseous and particulate emissions. This project consists of two subprojects. One will isolate building sites from which mercury contamination issues and will provide facilities for treatment of all effluents and rainfall runoff from those sites. The second subproject will modify existing process facilities to reduce or eliminate atmospheric release of hazardous particulates, toxic vapors, and airborne radionuclide emissions from existing weapon production processes.

Facility for control and disposal of mercury

Parts of the Y-12 Plant are moderately contaminated with mercury as a result of past large-scale operation of a mercury-based isotope separation system. Rain water and any process water coming into contact with the contaminated buildings, equipment, or soil surrounding the old mercury process facilities generally becomes contaminated with environmentally unacceptable levels of mercury. This project will provide for installation of water treatment facilities for reducing the mercury concentration in water being discharged from the Y-12 Plant to the East Fork Poplar Creek. Construction will include isolation of mercury-contaminated building sites to control all discharges from the site. Primary treatment facilities for the limited amount of effluents projected for each site will be based on proven ion exchange technology

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Air and water pollution control facilities,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

8. Brief physical description of project (contd.)

currently used at the site to process mercury-contaminated water. A secondary treatment facility based on standard domestic water treatment technology to process all water, process effluents, and rainfall runoff, draining from the plant into the headwaters of the East Fork Poplar Creek. This would be located upstream from the New Hope Pond, a catchment for plant runoff. Water will enter the secondary treatment plant through a coarse screen for removal of a flotsam and gravel. The screened water will flow to either of two settling tanks for bulk removal of sediment. The effluent from these settling tanks will be treated with polyelectrolytes, pH adjusting reagents, and flocculating chemicals to capture residual suspended particulates in either of two clarifier tanks. The clarified water will flow through either of two rapid sand filters for final particulate polishing and on to ion exchange columns for final mercury removal before release to the East Fork Poplar Creek. This subproject includes a 32,000-square-foot building to house the sand filters, ion exchange beds, chemical metering systems, a control room, and a water analysis laboratory.

Facility for control of gaseous and particulate emissions

The subproject for control of atmospheric releases will provide equipment changes for existing processes to control or reduce the release of volatile or toxic chemicals to the environment in excess of allowable limits. Stack modifications, filters, scrubbers, and organic emission controls will be provided to limit stack emissions where process modifications are not feasible.

The FY 1985 funding will be used for design of construction requirements and for minor corrective construction.

9. Purpose, justification of need for, and scope of project

The Y-12 Plant has been cited recently for noncompliance in several environmental areas by both the State of Tennessee Department of Health and Environment (TDHE) and the U.S. Environmental Protection Agency (EPA).

Past and present disposal practices for liquid wastes are no longer acceptable. Dilute liquid wastes may no longer be discharged directly or indirectly to either the East Fork Poplar Creek which originates within the plant and runs through the City of Oak Ridge, or to the Bear Creek drainage basin.

Certain past operations have left an environmental legacy of mercury-contamination at the plant. Lithium isotope separation processes operated in the late 1950's and early 1960's resulted in extensive losses of mercury within the Y-12 Plant. Residual mercury contained in old process buildings and grounds of the plant resulted in the discharge of this hazardous material to the East Fork Poplar Creek and continuous violation of the Tennessee Stream Guide for mercury. In order to attempt to meet the State guides, sources of contamination such as old process buildings, equipment, and soils containing spill residue will be substantially reduced by removal of mercury-contaminated equipment and building cleanup under Project 84-D-124, Environmental Improvements, Y-12 Plant. This work will require followup control (to be provided by this project) to prevent mercury released from contaminated soil into plant site drainage from discharging into the East Fork Poplar Creek.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Air and water pollution control facilities,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

9. Purpose, justification of need for, and scope of project (contd.)

In addition to problems associated with solid and liquid wastes, airborne contamination is also a concern. Existing regulations limit the loss of organic solvents to a level that is significantly lower than present values at Y-12. Meeting the regulations will require substitution of materials and additional process control.

Subsequent to the notification of noncompliance in these areas, certain environmental objectives were agreed upon by the TDHE, EPA, and the U.S. Department of Energy (DOE) in a Memorandum of Understanding (MOU), dated May 26, 1983. The MOU delineates the actions which constitute preliminary measures toward full environmental compliance, and it has been strongly stated both in the MOU and subsequent meetings among the TDHE, EPA, and DOE that further plans, actions, and remedial programs will be developed. To this end, this project will provide improvements which are necessary to support the current MOU and those that will be required in the near term to meet further compliance agreements between the parties.

Air emission and control facilities

Plant emissions of inorganic and organic vapors released in certain process and development activities, electroplating operations, and other production facilities must be controlled and reduced. This project will provide appropriate facilities to reduce releases of inorganic and organic vapors.

Facilities are included in this project for reducing the Y-12 Plant stack emissions to meet the proposed new regulation on radionuclide emissions. Naturally occurring and man-made radioisotopes have been declared as hazardous air pollutants by the EPA, under authority of Sections 112 and 122 of the Clean Air Act. The EPA has proposed a new regulation limiting the emission of airborne radionuclides to levels which would assure that the maximum exposed member of the public would receive a radiation dose of less than 10 millirems per year to the whole body and 30 millirems to any organ of an individual living at the site boundary of a DOE facility.

Remedial actions for control and disposal of mercury

Mercury contamination in the ground and building foundations in sections of the Y-12 Plant contribute to unacceptable contamination of waters which discharge to the East Fork Poplar Creek by leakage to the storm sewer system and direct contamination of groundwater. Facilities are included in this project for removal of the sources of mercury by decontamination of soils, exclusion of mercury from waterways, and substantial reduction of any remaining residual contamination of the water by treating the upper East Fork Poplar Creek before it leaves the Y-12 Plant.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Air and water pollution control facilities,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approx. 20 percent of construction costs, Item b		\$ 4,600
b. Construction costs		18,600
(1) Improvements to land including, excavations, and regrading	\$ 1,000	
(2) Buildings, warehouse and support, approx. 50,000 square feet @ \$50/square foot	2,500	
(3) Special facilities, including process changes, emission control facilities, and water treatment plant	14,100	
(4) Utilities, including electrical power, water, steam, and sanitary sewer	1,000	
c. Standard equipment		1,000
	Subtotal	\$24,200
e. Contingency at approximately 25 percent of above costs		5,800
	Total project cost	\$29,000

11. Method of performance

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

12. Funding schedule of project funding and other related funding requirements

	FY 1985	FY 1986	FY 1987	FY 1988	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 1,500	\$6,200	\$12,100	\$ 9,200	\$29,000
Total facility cost	\$ 1,500	\$6,200	\$12,100	\$ 9,200	\$29,000
2. Other project funding					
(a) Conceptual design	\$ 200	\$ 0	\$ 0	\$ 0	\$ 0
Total other project funding	\$ 200	\$ 0	\$ 0	\$ 0	\$ 0
Total project funding (Items 1 and 2)	\$ 1,700	\$6,200	\$12,100	\$ 9,200	\$29,200

a/ These estimates are the product of a preliminary engineering assessment. A conceptual design report costing approximately \$800,000 will be completed in March 1984.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Air and water pollution control facilities,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 85-D-121

12. Funding schedule of project funding and other related funding requirements (contd.)

b. Other related funding requirements (estimated life of project: 15 years)

1. Facility operating costs	\$ 800
2. Programmatic operating expenses directly related to the facility	700
3. Capital equipment not related to construction but related to the programmatic effort in the facility	0
4. GPP or other construction related to programmatic effort in the facility	0
5. Other costs	0
Total other related annual funding requirements	\$ 1,500

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design

Conceptual design for this project is being prepared by the operating contractor at a cost of about \$150,000.

b. Other related funding requirements

It is estimated that the useful life of this project will be approximately 25 years.

1. Facility operating costs

Facility operating costs estimated at \$800,000 per year include the cost of utilities, janitorial services, related material and supplies plus overhead.

2. Programmatic operating costs

Facility operating expenses of approximately \$700,000 annually will cover the cost of operating labor, equipment maintenance, supplies, fuel, and overhead.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars)

1. Title and location of project: Safeguards and site security upgrade, Mound Facility, Miamisburg, Ohio	2. Project No.: 85-D-122
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None Date:
3a. Date physical construction starts: 3rd Qtr. FY 1985	6. Current cost estimate: \$ 2,700 Date: 1/84
4. Date construction ends: 4th Qtr. FY 1986	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
23	1985	\$ 2,700	\$ 2,700	\$ 2,700	\$ 1,000
	1986	0	0	0	1,700

8. Brief physical description of project

This project consists of the purchase and installation of safeguards equipment and systems which will reduce probability of unauthorized removal of special nuclear materials (SNM) and/or the sabotage of vital facilities at specified locations at the Mound Facility. This project will provide increased security assurance against the unauthorized removal of SNM. The implementation of this project will require the installation of detection and assessment systems, upgrading of building and vault physical barriers, installation of card access control systems and associated physical barriers, as well as the installation of bullet resistant observation posts and closed circuit televisions (CCTV) atop strategically located buildings.

The elements of this project are the following:

Building upgrades

This project provides for the hardening of one building and critical areas of another building. Hardening will consist of such items as modifying building entrances to provide appropriate access controls, detection, assessment, delay, and search capabilities consistent with DOE threat guidance. Storage vaults and critical areas within the building will be compartmentalized and hardened. Critical areas will be upgraded with special access controls, upgraded physical barriers, and detection and assessment systems.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade,
Mound Facility, Miamisburg, Ohio

2. Project No.: 85-D-122

8. Brief physical description of project (contd.)

Access controls at critical areas

This portion of the project provides for computer-aided card access controls to be located at the protected area perimeter of SNM areas and other critical areas at the Mound Facility. The system will provide automatic logging and personnel access control. Approximately 150 card access control stations are required.

Elevated hardened guard towers

Six bullet resistant prefabricated observation posts atop existing buildings are required. The observation posts will be hardened to provide protection against small caliber projectiles fired at close distances. The observation posts will be approximately 6 feet by 6 feet by 7 feet in size and equipped with night vision devices and binoculars, along with necessary communications equipment. The observation posts will also be supplemented with low level CCTV systems which are remotely monitored at guard headquarters. The CCTV cameras will be equipped with pan/tilt and zoom capabilities and will be located in the same general building locations as the observation posts.

The FY 1985 funding will be used to initiate design, acquire the elevated guard towers, and procure some standard equipment.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to improve safeguards and security facilities at the Mound Facility in order to deter unauthorized entrance into areas where SNM is processed, handled, and stored. This project is required to meet the intent of DOE Order 5632.2, Physical Protection of Special Nuclear Materials, and recommendations of the DOE Office of Safeguards and Security. The construction planned will provide early warning of, and a deterrent to, any attempted unauthorized entrance into the SNM areas.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project:	Safeguards and site security upgrade, Mound Facility, Miamisburg, Ohio
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2. Project No.: 85-D-122

10. Details of cost estimate a/

<u>Item cost</u>	<u>Total cost</u>
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a.	Engineering, design, and inspection at approximately 15 percent of construction costs, item b ..		\$ 260
b.	Construction costs		1,750
	(1) Building modifications and guard towers	\$ 1,000	
	(2) Special facilities, including instrumentation, vehicle barriers, and personnel loggers	750	
c.	Standard equipment		300
	Subtotal		<u>\$ 2,310</u>
d.	Contingency at approximately 17 percent of above costs		390
	Total project cost		<u>\$ 2,700</u>

11. Method of performance

Design and inspection and procurements will be performed by operating contractors. Construction will be accomplished by fixed-price contracts awarded on the basis of competitive bids. The operating contractor will furnish and install selected items of special equipment and will perform minor completion tasks.

12. Funding schedule of project funding and other related funding requirements

Not required.

13. Narrative explanation of total project funding and related funding requirements

Not required.

a/ Based on completed conceptual design.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Safeguards and site security upgrade, Phase I,
Pantex Plant, Amarillo, Texas	2. Project No.: 85-D-123
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 4th Qtr. FY 1985	6. Current cost estimate: \$6,000
Date: 1/84
4. Date construction ends: 2nd Qtr. FY 1987	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 1,000	\$ 1,000	\$ 1,000	\$ 600
1986	5,000	5,000	5,000	4,100
1987	0	0	0	1,300

8. Brief physical description of project

This project provides for a new internal exclusion area and personnel control program, and for the design of a new plant perimeter security system, to enhance the security posture of the Pantex Plant. The project, as currently defined, includes the following items:

a. Personnel control facilities

A new internal exclusion area and personnel control facilities for special nuclear materials (SNM) work areas of Zone 12 will be created by the construction of approximately 1.85 miles of 8-foot-high chain link fence and four badge verification stations to control personnel access. Badge verification will be accomplished in guard stations by the addition of electronic badge reader(s), a microcomputer, television monitors, and video disc reader. The badge readers will access a microcomputer located in the administration building.

Each badge verification station (approximately 150 square feet) will be strategically located as appendages to existing ramps leading to SNM areas. Each station will have two radiation detectors and traffic control devices, such as pipe rails to channel pedestrian traffic and bicycles and gates to control forklift and electric cart traffic. Traffic control devices will be constructed within the existing ramp.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade, Phase I,
Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-123

8. Brief physical description of project (contd.)

The new fencing will be diamond mesh chain link fabric, 8 feet full height with line posts spaced at 10 feet on center and set in concrete. Twelve (12) gates will be required in the fence line to maintain access to the area for maintenance vehicles and fire department vehicles and personnel. A total of approximately 550 linear feet of 12-foot-wide and approximately 1,400 linear feet of 20-foot-wide roadway is required in segments to redirect and allow access for maintenance and emergency vehicles. Lighting for this internal exclusion area will consist of 21 100-foot-high steel light poles.

The badge verification system will display a stored image when the badge reader reads a badge. The images will be permanently stored on video laser discs having a capacity of 15,000 stored images and will display in less than .5 seconds. The microcomputer will be able to store information and the system can keep an accountability and historical record of access for later retrieval as required. The system will have common communication, data, and video loops between all stations, thus allowing shared resources in the event of hardware failure and the utilization of auxiliary badge readers and monitors at specific gates when high traffic is expected during shift change.

Safeguards and security assessments are an ongoing process and the identification of additional requirements in future years is anticipated.

The FY 1985 funding will be used to initiate design associated with the personnel control program, and with the secure plant boundary subproject.

b. Secure plant boundary

This project provides for the design of approximately 18.5 miles of 8-foot-high chain link security fence, 20-foot-wide patrol road and associated drainage facilities, and perimeter lighting.

The Pantex Plant is presently bounded by county roads, on the west, north and east, respectively. Adjacent to the south boundary line is property owned by Texas Tech University. The south boundary line provides only approximately 800 feet of distance between buildings containing sensitive production and operations activities and the Plant's south property line. Preparations are underway to lease additional land from Texas Tech University for the purpose of creating a greater security buffer zone on the Plant's south boundary line. The existing outer perimeter of the Plant is presently marked with a 4-foot-high barbed wire fence and posted with no trespassing signs. This design project will provide security protection to our existing east, north, and west boundaries and to an expanded boundary line approximately 2,600 feet south of the existing south property line.

The perimeter security fence will be an 8-foot-high chain link fence and gates, consisting of steel wire fabric, topped by three (3) strands of barbed wire on brackets, angled outward. Fencing fabric shall extend to within two inches of firm ground. Steel fence posts will be set in concrete and spaced at 10 feet on center. Appropriate no trespassing and warning signs will be spaced at approximately 50 feet along the entire boundary.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade, Phase I,
Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-123

8. Brief physical description of project (contd.)

A separate 800 LF 8-foot-high chain link security fence and lights will be constructed to provide protection around a ground water storage tank located on existing Texas Tech University property. This water storage tank is an integral part of the Plant's water supply system. However, it is located such that it lies outside the proposed extension of the Plant's south boundary line on Texas Tech University property.

Perimeter lighting will be provided by the construction and installation of 600 35-foot poles with one 400-watt high pressure sodium fixture on each pole. The spacing of the poles will be approximately 150 feet. In order to provide proper distribution of power along the perimeter, ten 37.5 KVA pad-mounted transformers, one 500 KVA pad-mounted transformer, and one 15 KW automatic transfer switch will be installed. Power will originate from the Plant's north substation and an existing overhead line will be upgraded and modified to handle the new power requirements.

9. Purpose, justification of need for, and scope of project

a. Personnel control program

Currently, personnel are checked for admittance two or three times when entering the Pantex Plant. These are where:
1) a vehicle enters an outer plant gate, a visual badge check is done on one badge per vehicle; 2) entering into Zone 12 or Zone 11; and 3) when entering into Zone 12 South from Zone 12 North.

A badge is verified now by the fact that a person has possession of the type of badge currently being utilized, and that the person in possession of the badge is the person whose picture is on the badge. Access to existing subdivided areas is based on "the need to know" concept by access codes on the badges. Badge verification for personnel entering this SNM area will be enhanced by the proposed electronic badge reader and video disc system which includes a controlled computer system verification. Upon a request for entry, this person's picture would have to be on file in the controlled video disc system.

b. Secure plant boundary

The design of the perimeter upgrade is proposed to identify a means to further restrict unauthorized entry to the plant property by the establishment of a perimeter "protected" area. A decrease in the security force's response time will help to prevent intruder penetration of the inner security defenses.

The present perimeter barrier is unlighted and consists of a standard four-strand barbed wire fence posted with warning signs approximately every 50 feet identifying the property as a government installation and serves as a livestock barrier for leased land inside the plant perimeter. Authorized access into these agricultural areas is limited to those individuals having business in the area and these persons are cleared each time for access.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade, Phase I, Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-123

9. Purpose, justification of need for, and scope of project (contd.)

The Pantex Plant production area and inner security defenses are located within 350 feet of the south boundary line. The production area is highly guarded and access is on a need-to-know basis. Present methods of detection of unauthorized personnel into the plant property would require excessive manpower. This design project will relocate the south boundary to provide a more adequate security buffer zone.

Vehicle access to the boundary from the plant side is strictly by off-the-road vehicle, hence vehicle guard patrols of the perimeter are not currently used. Vehicle access from hard surfaced roads is possible only to approximately 60 percent of the boundary from the outside. The 20-foot-wide patrol road will permit access of the perimeter from the plant side and will also be used by maintenance vehicles for maintenance of the security system and in the performance of their routine duties.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approx. 22 percent of construction costs, Item b		\$ 1,605 b/
b. Construction costs		3,205
(1) Improvements to land	\$ 275	
(2) Buildings	460	
(3) Other structures	70	
(4) Utilities	2,400	
c. Standard equipment		400
Subtotal		\$5,210
d. Contingency at approximately 15 percent of above costs		790
Total estimated cost		\$6,000

11. Method of performance

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

a/ Based upon completed conceptual design.

b/ Includes approximately \$880,000 to perform engineering for security plant boundary subproject to be included in Phase II.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade, Phase I,
Pantex Plant, Amarillo, Texas

2. Project No.: 85-D-123

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>Total</u>
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$ 0	\$ 0	\$ 600	\$ 4,100	\$ 1,300	\$ 6,000
Total facility cost	\$ 0	\$ 0	\$ 600	\$ 4,100	\$ 1,300	\$ 6,000
2. Other project funding						
(a) Conceptual design	\$ 0	\$ 10	\$ 0	\$ 0	\$ 0	\$ 10
Total other project funding	\$ 0	\$ 10	\$ 0	\$ 0	\$ 0	\$ 10
Total Project Funding (Items 1 and 2)	\$ 0	\$ 10	\$ 600	\$ 4,100	\$ 1,300	\$ 6,010

b. Other related funding requirements (estimated life of project: 25 years)

1. Facility operating costs	\$ 0
2. Programmatic operating expenses directly related to the facilities	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility	0
4. GPP or other construction related to programmatic effort in the facility	0
5. Other costs	0
Total other related annual funding requirements	\$ 0

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design

The cost of the conceptual design prepared for this project was \$10,000.

b. Total related funding requirements

Not required.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars)

1. Title and location of project: Safeguards and site security upgrade,
Rocky Flats Plant, Golden, Colorado	2. Project No.: 85-D-124
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 3rd Qtr. FY 1985	6. Current cost estimate: \$ 3,400
Date: 1/84
4. Date construction ends: 1st Qtr. FY 1987	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
239	1985	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000
	1986	2,400	2,400	2,400	1,900
	1987	0	0	0	500

8. Brief physical description of project

This project will provide for a positive identification system for all special nuclear materials (SNM) areas on the Rocky Flats Plant. This system will include metal detectors, explosive detectors, package x-ray equipment, personnel identification verification (voice, fingerprint, or similar unique feature), intelligent interface equipment, audiovisual alarms, turnstiles, and a central processor with appropriate peripheral equipment to store, record, and transmit daily activity data. The central processing equipment will be located within the perimeter security zone and will have an uninterruptable power supply and adequate temperature and humidity controls for continuous operation. The system will provide controlled access to SNM areas. The positive identification system will be integrated with a personnel logging system.

This project will be modeled after the advanced physical protection system (APPS) developed under contract to the Department of Energy (DOE) by Allied-General Nuclear Services at the Barnwell Nuclear Fuel Plant, Barnwell, South Carolina. The design of the APPS will be modified to meet Rocky Flats requirements, the latest editions of industrial codes and standards, and the latest revisions of DOE guidelines.

The positive identification system will be housed in building additions (approximately 544 square feet each) adjoining the three perimeter security zone portal guard posts and the guard post at the nuclear safety facility.

The requested FY 1985 funding will be used for design and procurement of equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 85-D-124

9. Purpose, justification of need for, and scope of project

A positive identification system is required for security enhancement in all areas where SNM are processed or stored. Tighter security will be obtained by establishing enhanced personnel access controls. The controls will include positive individual identification and verification of that individual's needs provided by the personnel loggers.

The positive identification system coupled with the personnel logging system will provide real-time accountability of employees in SNM areas. This capability will significantly decrease the possibility of theft of SNM and will ensure that no employee inadvertently carries contamination outside SNM areas.

Related work at Rocky Flats includes a prototype badge reader system installed during fiscal year 1981 in the plutonium recovery facility and the personnel loggers project which will be integrated with the positive identification system. The personnel loggers project is a badge reader system for the perimeter security zone. This project will add positive identification features for automated verification and access control.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 13% of construction costs, item b		\$ 120
b. Construction costs		900
(1) Improvements to land	\$ 30	
(2) Building additions and guard posts modifications	200	
(3) Special facilities, including enclosures, barriers, and personnel loggers	670	
c. Standard equipment		1,930
Subtotal		\$ 2,950
d. Contingency at approximately 15% of above costs		450
Total project cost		\$ 3,400

11. Method of performance

Design and inspection and procurements will be performed by operating contractors. Construction will be accomplished by fixed-price contracts awarded on the basis of competitive bids. The operating contractor will furnish and install selected items of special equipment and will perform minor completion tasks.

a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 85-D-124

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 0	\$1,000	\$ 1,900	\$ 500	\$ 3,400
(b) PE&D funding	0	0	0	0	0
Total facility cost	\$ 0	\$1,000	\$ 1,900	\$ 500	\$ 3,400
2. Other project funding					
(a) Conceptual design	\$ 12	\$ 0	\$ 0	\$ 0	\$ 12
Total other project funding	\$ 12	\$ 0	\$ 0	\$ 0	\$ 12
Total Project Funding (Items 1 and 2)	\$ 12	\$1,000	\$ 1,900	\$ 500	\$ 3,412
b. Other related funding requirements (estimated life of project: 15 years)					
1. Facility operating costs					\$ 81
Total other related funding requirements					\$ 81

13. Narrative explanation of total project funding and related funding requirements

- a. Total project funding
- 2. Other project funding
 - (a) Conceptual design

The cost of the conceptual design prepared for this project was \$12,000.

- b. Other related funding requirements

It is estimated that the programmatic life of these facilities will be at least 15 years.

- 1. Facility operating costs

Annual facility operating costs, estimated at \$81,000, will cover the cost of 2 maintenance personnel, 2 technical specialists, utilities, materials, and supplies.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Tactical bomb production facilities, various locations	2. Project No.: 85-D-125
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None Date:
3a. Date physical construction starts: 4th Qtr. FY 1985	6. Current cost estimate: \$35,800 Date: 1/84
4. Date construction ends: 3rd Qtr. FY 1988	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
22	1985	\$10,000	\$10,000	\$10,000	\$ 2,500
23	1986	21,800	21,800	21,800	16,300
24	1987	4,000	4,000	4,000	13,700
	1988	0	0	0	3,300

8. Brief physical description of project

This project provides for the additional production capacity required to support the production of additional B61 tactical gravity bombs as projected in the current Nuclear Weapons Stockpile Memorandum. This project funding will support: new equipment; new buildings and building additions; renovation of some existing structures to adapt them for use in B61 production activities; and special facilities needed for production, certification, and assembly of components.

At the Kansas City Plant, this project will provide expanded and upgraded facilities in existing space and new production equipment. Existing space will be modified by installation or relocation of walls; new ceilings and floors; provision of additional temperature, humidity, and dust controls; and extensions of normal factory utilities. Equipment items to be provided include numerically controlled lathes and mills; cleaning and conformal coating equipment; and miscellaneous certification, production and acceptance equipment.

At the Mound Plant, this project will provide equipment for forming and molding plastics, ultrasonic inspection, and miscellaneous certification, production, and acceptance processes. No new buildings or building additions are required.

The Y-12 Plant requirements are primarily to support production. The funding will provide 14,000 square feet of additional production support office space. The addition will be of standard construction to conform to existing criteria. Utilities will

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Tactical bomb production facilities,
various locations

2. Project No.: 85-D-125

8. Brief physical description of project (contd.)

be extensions of existing lines. Equipment to be procured includes numerically controlled machine tools and gages; metal preparation and forming furnaces, ovens and presses; acceptance/inspection equipment; and laboratory support equipment.

At the Rocky Flats Plant, additional equipment will be provided to support technical changes. The Rocky Flats Plant needs are primarily equipment for implementation of a new storage bottle machining and testing process. The equipment will be installed within current facilities or facilities already under construction. Included in the current list of equipment needs are a post-warm annealing furnace, a coordinate measurement machine, a crush grinder, and improved technology electronic test equipment. No new buildings or building additions are required.

The requested FY 1985 funding will be used for design, procurement of long-lead equipment, and construction.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide additional production capacity needed to increase the B61 tactical bomb production rate. Maximum use will be made of existing capabilities and capacities in the production of these additional B61 bombs, including the facilities provided under Project 82-D-108, Nuclear Weapon Stockpile Improvement, Various Locations. A new Department of Defense initiative has been established to revise the current plan for modernizing the tactical bomb stockpile.

10. Details of cost estimate a/

a. Engineering, design, and inspection at approximately 20% of construction costs, item b	\$ 3,900
b. Construction costs and special facilities	18,900
c. Standard equipment, including procurement and installation	5,900
Subtotal	\$28,700
d. Contingency at 25% of above costs	7,100
Total Project Cost	\$35,800

Estimates by location are as follows:

Rocky Flats Plant, Golden Colorado	\$ 2,600
Bendix Plant, Kansas City, Missouri	8,800
Y-12 Plant, Oak Ridge, Tennessee	20,000
Mound Facilities, Miamisburg, Ohio	4,400
Total	\$35,800

a/ Based upon preliminary cost analysis of existing facilities. Conceptual design is in preparation.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Tactical bomb production facilities,
various locations

2. Project No.: 85-D-125

11. Method of performance

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

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$ 0	\$2,500	\$16,300	\$13,700	\$3,300	\$35,800
Total facility cost	\$ 0	\$2,500	\$16,300	\$13,700	\$3,300	\$35,800
2. Other project funding						
(a) Conceptual design	\$ 100	\$ 0	\$ 0	\$ 0	\$ 0	\$ 100
Total other project funding	\$ 100	\$ 0	\$ 0	\$ 0	\$ 0	\$ 100
Total Project Funding	\$ 100	\$2,500	\$16,300	\$13,700	\$3,300	\$35,900
b. Total related funding requirements (estimated life of project: 20 years)						
1. Facility operating costs						\$ 3,000
2. Programmatic operating expenses directly related to the facility						7,500
Total other related funding requirements						\$10,500

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

2. Other project funding

(a) Conceptual design

Conceptual design costs of approximately \$100,000 will be incurred in the process of developing and improving the project cost estimate and schedule.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Tactical bomb production facilities,
various locations

2. Project No.: 85-D-125

13. Narrative explanation of total project funding and related funding requirements (contd.)

b. Total related funding requirements

It is estimated the programmatic life of these facilities will be at least 20 years.

1. Facility operating costs

Approximately \$3,000,000 per year will be required to cover the cost of utilities, maintenance, janitorial services, and related overhead costs.

2. Programmatic operating expenses directly related to the facility

The average annual incremental cost of direct labor, tooling procurement, tooling fabrication, and overhead is estimated at \$7,500,000 per year.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: TRIDENT II warhead production facilities,
various locations	2. Project No.: 84-D-112
3. Date A-E work initiated: 1st Qtr. FY 1984	5. Previous cost estimate: \$96,000
Date: 1/83
3a. Date physical construction starts: 1st Qtr. FY 1985	6. Current cost estimate: \$134,500 <u>a/</u>
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1988	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1984	\$19,300	\$19,300	\$19,300	\$ 8,400
	1985	60,700	60,700	60,700	24,000
	1986	48,800	48,800	48,800	44,000
	1987	5,700	5,700	5,700	40,500
	1988	0	0	0	17,600

8. Brief physical description of project

This project provides additional production capacity and capability required to support production of the TRIDENT II warhead. New facilities to be provided by this project include: equipment; building additions; renovation of some existing structures to adapt them for use in TRIDENT II production activities; and special facilities needed for production, certification, and assembly of components and complete warheads.

The physical requirements for production of the TRIDENT II nuclear warhead have changed substantially since the FY 1984 congressional budget submission. Facility requirements for production of the new warhead are described below.

a/ The current cost estimate assumes that TRIDENT II warhead production will share certain production capability valued at \$30,000,000 to be provided under Project 81-D-115 for Missile X (PEACEKEEPER) warhead production facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: TRIDENT II warhead production facilities,
various locations

2. Project No.: 84-D-112

8. Brief physical description of project (contd.)

At the Y-12 Plant, this project will provide specific new capability for production of new weapon components, including etching facilities, low-voltage imaging system, and a cleaning and packaging facility for metal strips. Additional capacity requirements for production of TRIDENT II warhead parts include a skull caster, abrasive saw, vacuum furnace, precision turning machines, multiaxis mills, a band mill saw, coordinate measuring machines, an ultrasonic gauge, and dye penetrant systems. Existing facilities that will be modified for use in producing the TRIDENT II warhead include preheat ovens, plasma-spray machines, electroplating stations, dryers, crimp welders, life certification and other ovens, a leak test station, a welding system, and an adhesive mixing station. A 20,000-square-foot building will be built to provide office space and approximately 11,700 square feet of existing buildings will be built for inspection equipment and for storage. Computer equipment to be provided includes the upgrade of machine controllers and for interfacing with other production sites.

216 At the Savannah River Plant, the existing tritium facilities will be modified to provide necessary capability and capacity needed for loading TRIDENT II reservoirs. An existing loading room will be modified to accommodate new loading hoods and required manifolds, pinch welders with associated instrumentation, an air-monitoring system, and an emergency confinement system. The project will also include installation of ion chamber detectors in exhaust duct risers, manifold relief piping, and an exhaust hood diversion system.

The Rocky Flats Plant will require minor renovations to existing buildings and provision of production equipment to handle the workload associated with the TRIDENT II warhead. A bottom pour induction casting furnace and three special coordinate measuring machines will be purchased to support pit fabrication and reservoir work. Additional equipment, including welders, microscopes, x-ray fixtures, x-ray spectrometer, gas chromatograph, and ultrasonic scanning equipment will be required. This project will provide for modification of existing safe-secure railcars which is necessary for shipping the TRIDENT II warhead. Modification of safe-secure vehicles is performed at the Rocky Flats Plant.

Construction at the Bendix Plant will include a 2,600-square-foot expansion in the Miniature Radar Assembly Facility. This will involve construction of walls; modifications to the existing heating, ventilating, and air-conditioning system; and provision of environmental controls to control relative humidity and temperature conditions. Equipment to be installed in the radar assembly area includes a spectrum analyzer, radio frequency signal generators, oscilloscopes, pulse generators, frequency counters, and related miscellaneous equipment. Rearrangement of the Electrical and Special Firing System Assembly Facility will include adding 2,200 square feet of floorspace for testing and encapsulation equipment. The space will be acquired from an adjacent manufacturing area. Similar environmental controls will be provided for the space addition. This additional capacity is required to accommodate testing equipment and polyurethane foam encapsulation equipment. This upgrade will include a new air-conditioning system, a grounded conducting floor, mini welder, foam production equipment, and miscellaneous development and assembly equipment. A new 1,500-square-foot microcircuit assembly area will be built for manufacturing and testing the TRIDENT II warhead radar. This area will be a Class 100,000 clean room with 30 percent maximum relative humidity controls and will be equipped with the necessary manufacturing, testing, and support equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: TRIDENT II warhead production facilities,
various locations

2. Project No.: 84-D-112

8. Brief physical description of project (contd.)

The existing Bendix Plant printed wiring board manufacturing and inspection facility will be relocated and expanded. The new facility will include a grating area for plating and etching operations. Construction will include new walls, ceilings, lights, sprinklers, exhaust systems, acid and caustic waste lines, sanitary sewers, and dedicated environmental controls. Equipment to be installed in the new printed wiring board facility will include automatic solution controllers, machining equipment, inspection equipment, and a new photolithography system. A new reel-to-reel flexible cable production area will be prepared and will involve a continuous web reel system to take up, mark, clean, print, etch, and strip roll stock. A copper-Kapton facility will be built to support the reel-to-reel flexible cable facility. Copper plating of Kapton reel stock will require installation of a copper plating line, a monitoring system for monitoring plating thickness, and related inspection equipment. The Bendix Plant will require significant additional support equipment to produce the current design of the TRIDENT II warhead. Major equipment items include an attenuation measurement system, power measurement system, and a voltage standing wave ratio measurement system for the calibration of the arming, firing, and fusing electronic assemblies. An engineering diagnostic system is also required for development testing and failure analysis of the arming, firing, and fusing assemblies. A new automatic wire bonder and hermetic sealer are required in producing hybrid microcircuits for the TRIDENT II.

2) Requirements at the Mound Facility for production of TRIDENT II warhead components include 67 pieces of equipment, renovation of existing production space in 8 locations, and construction of 3 support buildings and a new detonator production building.

3) Improved capabilities and capacity will be provided in the following areas. Modifications will be made to existing detonator production facilities to provide a suitable clean room environment and to accommodate equipment for automated parts manufacture. A 16,000-square-foot, two-story brick and block addition will be built on an existing machining building to accommodate new machine tools needed to produce TRIDENT II timer parts. A five-story central operational support building of approximately 50,000 square feet will be built into a hillside. This structure will provide test and process assembly areas and offices, physical standards laboratories and offices, and offices for process engineering, materials development, and isotopes separation personnel. An addition of approximately 80,000 square feet will be built on the existing four-story Administration Building to provide office space, a conference room, and a classified document distribution center. In the same building, 13,000 square feet of existing space will be renovated to provide suitable space for new office employees to work while awaiting clearance, to provide space for communications equipment, and to accommodate an emergency response communications center. A new two-story process support building of approximately 11,000 square feet will be built in the special metallurgy area to provide offices, a conference room, lobby, storage, shops, and offices for approximately 60 people. Two computer-aided design systems will be installed to handle the increase in automated product definition transferred from the design agencies. Surface analytical instrument and electron microprobe will be installed for use with high explosives to determine materials compatibility, integrity, and quality assurance. Increased cleanliness requirements in the timer manufacturing area will include installation of a new press, a new laser welder, a new dry atmosphere enclosure, a moisture monitor, and a pressurization system.

New manufacturing technology will include high explosive material characterization and detonator testing equipment. A remotely operated high explosive disassembly lathe with TV monitoring will be provided along with a high explosive incinerator, a laser welder, a 100,000 psi pressurization system, a glue bonding digital readout and data processor, and

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: TRIDENT II warhead production facilities,
various locations

2. Project No.: 84-D-112

8. Brief physical description of project (contd.)

miscellaneous monitoring equipment. Other major items of equipment to be procured and installed at the Mound Facility include a computer controlled machining center, a surface grinder, a laser measurement system, and an electrical discharge machining center. A new reservoir component evaluation system will be installed in an existing glove box and will include modifications to the gas expansion system, pressure-volume-temperature (PVT) analytical equipment, a drill system and related alignment, and positioning equipment needed to accommodate the TRIDENT II reservoir.

At the Pinellas Plant, this project will provide production and test equipment to meet TRIDENT II mission assignments of the plant. The following equipment will be installed in existing manufacturing space or in the 3,000 square-foot new building additions to be provided under other projects. New equipment will include such as a vacuum furnace, silk screen printer, sintering furnace, assembly robotics, a numerically controlled spinning lathe, real time x-ray inspection system, and calibration and testing equipment.

213 The Pantex Plant will be provided with standard equipment needed for production support for the TRIDENT II warhead. An accelerated aging test unit will be built which will include a temperature chamber with sampling and recording equipment. Pressure and humidity measurement devices and temperature programmers will be installed to support materials compatibility testing.

The increase in the total estimated cost (TEC) for this project results from a change in warhead design and a consequent increase in equipment requirements at most sites plus a substantial increase in space requirements at Mound. Approximately \$29,000,000 of this increase is associated with construction of three buildings and renovation of an existing building at Mound. This new space is necessary to support production of all new weapon systems at Mound, starting with the TRIDENT II.

The revised TEC provides \$5,500,000 to cover facility design and process uncertainties that have not been resolved at this time. Included in this amount are potential costs for an auxiliary caster, a simulator for maintenance support of machine control devices, additional thickness gauges, and additional quality evaluation equipment.

The requested FY 1985 funding will be used for long-lead equipment procurement and initiation of major construction.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide new capabilities and additional production capacity to meet currently established requirements for the TRIDENT II warhead.

Maximum use will be made of existing capacities and capabilities in preparing for production of the TRIDENT II warhead. Unique features of this warhead will require capabilities not currently available in the production plants. The facilities to

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: TRIDENT II warhead production facilities,
various locations

2. Project No.: 84-D-112

9. Purpose, justification of need for, and scope of project (contd.)

be provided by this project are required to produce the warhead as scheduled in the current Nuclear Weapons Stockpile Memorandum. The Department of Energy (DOE) and the Department of Defense (DOD) currently plan to enter into an agreement in early FY 1984 to proceed with Phase 3 development engineering for the TRIDENT II warhead. The first production unit is scheduled for October 1988.

The cost estimate is based on preliminary warhead design information and limited conceptual design. The cost estimate includes an uncertainty allowance to cover process unknowns associated with the newly selected warhead design.

10. Details of cost estimate a/

Total cost

a. Engineering, design, and inspection at approximately 14% of construction, standard equipment, and process uncertainties	\$ 15,000
b. Construction costs and special facilities	54,000
c. Standard equipment, including procurement and installation	50,000
Subtotal	119,000
d. Contingency at approximately 12% of above costs	10,000
e. Design and process uncertainties	5,500
Total estimated cost	\$134,500

Estimates by location are as follows:

Y-12 Plant, Oak Ridge, Tennessee	\$ 52,000
Rocky Flats Plant, Golden, Colorado	15,700
Bendix Plant, Kansas City, Missouri	20,000
Mound Facility, Miamisburg, Ohio	27,500
Pinellas Plant, St. Petersburg, Florida	13,300
Savannah River Plant, Aiken, South Carolina	2,000
Pantex Plant, Amarillo, Texas	4,000
Total	\$134,500

a/ Estimate based on preliminary warhead design information and limited conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: TRIDENT II warhead production facilities,
various locations

2. Project No.: 84-D-112

11. Method of performance

Design and inspection will be performed primarily by the operating contractors and, where feasible, under negotiated architect-engineer contracts. Equipment procurement, inspection, and installation will be performed by operating contractors.

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>Total</u>
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$ 8,400	\$24,000	\$44,000	\$40,500	\$17,600	\$134,500
Total facility costs	8,400	24,000	44,000	40,500	17,600	134,500
2. Other project funding						
(a) Conceptual design	90	0	0	0	0	90
Total other project funding	90	0	0	0	0	90
Total project funding (items 1 and 2)	\$ 8,490	\$24,000	\$44,000	\$40,500	\$17,600	\$134,590
b. Other related funding requirements (estimated life of project: 10 years)						
1. Facility operating costs						\$ 2,500
2. Programmatic operating expenses directly related to the facility						6,500
Total other related funding requirements						\$ 9,000

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
 - 1. Other project funding
 - (a) Conceptual design

Conceptual design costs of about \$90,000 will be incurred through FY 1984 in the process of developing and improving the project cost estimate and schedule.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: TRIDENT II warhead production facilities, various locations	2. Project No.: 84-D-112
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13. Narrative explanation of total project funding and other related funding requirements (contd.)

b. Other related funding requirements

It is estimated that the programmatic life of this facility will be at least 10 years.

1. Facility operating costs include utilities, maintenance, janitorial services, and related overhead.
2. Programmatic operating expenses include direct labor, materials and supplies, procurement and fabrication of tooling, and overhead.

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Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations	2. Project No.: 84-D-113
3. Date A-E work initiated: 1st Qtr. FY 1984	5. Previous cost estimate: \$94,500
Date: 1/83
3a. Date physical construction starts: 1st Qtr. FY 1986	6. Current cost estimate: \$97,000 a/
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1988 a/	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1985	\$15,000	\$15,000	\$15,000	\$ 3,000
	1986	56,500	56,500	56,500	22,300
	1987	23,100	23,100	23,100	38,900
	1988	2,400	2,400	2,400	32,800

8. Brief physical description of project

This project provides additional production capacity and capability required by the weapons production complex to produce nuclear warheads for the antisubmarine warfare/standoff weapon (ASW/SOW) program. New facilities to be built within six of the weapons production plants will consist primarily of specialized equipment and facilities needed to build weapon components. Following are descriptions of new construction to be provided at each site.

At the Kansas City Plant, construction of additional production facilities will be done inside the existing main manufacturing building. An enclosed room will be isolated from general plant traffic and equipped as a hydrogen environment test facility for use in performing hydrogen storage tests on ASW/SOW components. The test room will be provided with explosion-proof

a/ This completion schedule and cost estimate rely upon the availability of facilities valued at \$24,000,000 included in Projects 81-D-115, MX (now PEACEKEEPER) Warhead Production Facilities, Various Locations, and 82-D-109, 155mm Artillery Fired Atomic Projectile (AFAP) Production Facilities, Various Locations. It also relies on the timely availability of selected production facilities valued at \$26,000,000 included in Project 84-D-112, TRIDENT II Warhead Production Facilities, Various Locations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations

2. Project No.: 84-D-113

8. Brief physical description of project (contd.)

lighting, air supply ducts, roof-mounted exhaust fan, and temperature chamber exhaust systems. A control room will be built and equipped with monitoring apparatus and space for test sample preparation. Standard equipment to be procured and installed at the Kansas City Plant includes five tracer lathes, a hot spin forming machine, and a coordinate measuring machine.

At the Pinellas Plant, a 10,000-square-foot addition to the main building will be built to provide space for ASW/SOW production facilities which will include space for vacuum storage for tubes, resin dispenser, and laser marking. A numerically controlled lathe and mill will be procured and installed in addition to miscellaneous inspection and production equipment.

At the Pantex Plant, available building space will be modified for special facilities and new equipment needed for ASW/SOW production. An accelerated aging unit and testing system will involve construction of a test chamber and associated sampling and recording equipment such as glass racks, pressure and humidity measurement devices, and temperature programmers. Additional calibration, analytical, and certification equipment will be provided for use in the standards laboratory material testing laboratory, test fire, and process inspection activities. Additional process equipment will be provided for pressing, machining, subassembly, and final assembly work. A surface area analyzer will be provided for use in acceptance inspection for high explosive materials.

At the Mound Facility, this project will provide and install additional equipment needed to develop, build, and test material and components for the ASW/SOW program. A thread grinder, an Auger Sputter gun, surface calorimeter, Brill oven, scattering spectrometer, and other equipment will be procured and installed for performance testing.

Production of detonators and command disable explosive component production specifications will require an expanded high explosive loading area, additional cleaning facilities, and a laser welder. Specialized gauges will be provided for inspection of high explosive assemblies. Additional test equipment will be provided for increased capacity for booster assembly and initiator production.

Additional quality control equipment including a scanning electron microscope, an infrared microspectrophotometer, and an x-ray fluorescence detection system will be provided for quality control of high explosive.

At the Rocky Flats Plant, existing production space will be modified to accommodate new production equipment needed for fabrication of ASW/SOW component parts. A significant amount of inspection, calibration, and analytical equipment will be required including an emission spectrograph and six spectrometers. Additional production equipment will include two numerically controlled lathes, three coordinate measuring machines, and a laser welder.

At the Y-12 Plant, Oak Ridge, Tennessee, this project will provide new capability and additional capacity for production and certification of ASW/SOW components and subassemblies. Space for a product certification activity will be provided by modifying about 1,000 square feet of an existing building. Items of major equipment to be provided include quench and aging ovens, a

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations	2. Project No.: 84-D-113
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8. Brief physical description of project (contd.)

casting furnace and mold quench system, bonding and pressing stands for component assembly, a weld station and weld positioner, adhesive mix station, a Cartesian coordinate measuring machine, and other equipment.

The increase of \$2,500,000 in total estimated cost is due primarily to an improved understanding of project requirements based on progress in the conceptual design efforts at each site and improved pricing information on major procurements.

The FY 1985 funding requested will be used for design, procurement of long-lead equipment, and to initiate construction of new facilities.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide new capabilities and additional production capacity to meet established warhead requirements for the ASW/SOW.

Maximum use will be made of existing capacities and capabilities in preparing for production of the ASW/SOW warhead. Unique features of the weapon will require capabilities not currently available in the production plants. The additional number of parts added to the production workload will require additional capacity at the production plants. The facilities to be provided by this project are required to produce the ASW/SOW warhead as scheduled in the current Nuclear Weapons Stockpile Memorandum. The Department of Defense and the Department of Energy plan to enter into an agreement during FY 1985 to proceed with development engineering (Phase 3) in FY 1985.

The cost estimate for this project includes an uncertainty allowance of \$6,500,000 to cover process unknowns associated with possible warhead design alternatives such as changes in material requirements. Not included in this cost estimate is \$24,000,000 for facilities which are currently scheduled for funding under Project 81-D-115, Missile X Warhead Production Facilities, and Project 82-D-109, 155mm AFAP Production Facilities. Production of the ASW/SOW warhead is planned to make joint use of these facilities concurrent with production of the W87 and W82 warheads. If financial support for production facilities for these two warheads is not provided on the current workload schedule, the cost of this project could increase by approximately \$24,000,000. Similarly, this project is planned to share production facilities valued at \$26,000,000 which are included in Project 84-D-112, TRIDENT II Warhead Production Facilities, Various Locations. This amount includes production space and production equipment at the Y-12 Plant, Pinellas Plant, and Mound Facility. It also includes computer-aided design and manufacturing equipment at all sites.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations

2. Project No.: 84-D-113

10. Details of cost estimate a/	Item cost	Total cost
a. Engineering, design, and inspection at approximately 11% of construction costs, item b		\$ 8,900
b. Construction costs		72,100
(1) Building additions and modification of existing buildings	\$ 8,200	
(2) Special facilities, including installation of production equipment and processing systems	63,900	
	Subtotal	81,000
c. Contingency at approximately 15% of above costs		9,500 b/
d. Design and process uncertainties		6,500
	Total estimated cost	\$97,000

The estimates by location are as follows:

Bendix Plant, Kansas City, Missouri	\$ 7,500
Pinellas Plant, St. Petersburg, Florida	6,000
Pantex Plant, Amarillo, Texas	2,500
Rocky Flats Plant, Golden, Colorado	8,700
Mound Facility, Miamisburg, Ohio	19,000
Y-12 Plant, Oak Ridge, Tennessee	46,800
Uncertainties	6,500
Total	\$97,000

11. Method of performance

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

a/ Based on preliminary engineering and partially completed conceptual designs.

b/ Contingency applies to work to be performed in FY 1984, FY 1985, FY 1986, FY 1987, and FY 1988.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations

2. Project No.: 84-D-113

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$ 0	\$ 3,000	\$22,300	\$38,900	\$32,800	\$97,000
Total facility costs	0	3,000	22,300	38,900	32,800	97,000
2. Other project funding						
(a) Conceptual design	105	0	0	0	0	105
Total other project funding	105	0	0	0	0	105
Total project funding						
(items 1 and 2)	\$ 105	\$ 3,000	\$22,300	\$38,900	\$32,800	\$97,105
b. Other related funding requirements (estimated life of project: 10 years)						
1. Facility operating costs						\$12,100
2. Programmatic operating expenses directly related to the facility						27,000
Total other related annual funding requirements						\$39,100

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
1. Other project funding
- (a) Conceptual design
- Conceptual design costs of approximately \$105,000 will be incurred in the process of developing and improving the project cost estimate and schedule.
- b. Other related funding requirements
- It is estimated that the programmatic life of this facility will be 10 years.
1. Facility operating costs
- Facility operating costs of approximately \$12,100,000 per year are projected to cover the costs of utilities, maintenance, janitorial services, and related overhead.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Antisubmarine warfare/standoff weapon warhead production facilities, various locations	2. Project No.: 84-D-113
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13. Narrative explanation of total project funding and other related funding requirements (contd.)

2. Programmatic operating expenses directly related to the facility

Programmatic operating costs of approximately \$27,000,000 per year are projected to cover direct labor, fringe benefits, production materials and supplies, and related overhead.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Consolidated nonnuclear manufacturing facility,
Rocky Flats Plant, Golden, Colorado	2. Project No.: 84-D-114
3. Date A-E work initiated: 1st Qtr. FY 1984	5. Previous cost estimate: \$46,800
Date: 1/83
3a. Date physical construction starts: 2nd Qtr. 1984	6. Current cost estimate: \$45,200
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1985	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1984	\$24,100	\$24,100	\$24,100	\$18,400
	1985	21,100	21,100	21,100	26,800

8. Brief physical description of project

This project will provide a new manufacturing building and associated support facilities, including a guard post, a cooling tower, and a parking area at the Rocky Flats Plant. All construction will be located on Government-owned land within the site boundaries of the Rocky Flats Plant. This project includes security fencing, some new equipment, and relocation of approximately 200 items of existing production equipment currently located in overcrowded, structurally inadequate buildings. This project includes renovation and rehabilitation of vacated space from which relocated equipment is to be removed.

Improvements to land will consist primarily of a new parking area adjacent to the new manufacturing building and modification of existing streets, walks, and security enclosures. A 210,000-square-foot area will be asphalt paved over a gravel base to provide parking for 600 vehicles. Suitable lighting, drainage, parking, and traffic flow markers will be provided. Existing security fencing will be modified to enclose the new manufacturing building and guard post. Approximately 1,600 feet of 8-foot-high chain link fencing will be installed. Power-operated access gates and security lighting will be provided.

The new manufacturing building will be a single-story, high-bay structure having approximate dimensions of 350 by 440 by 25 feet high. The building will be a preengineered structural steel or precast twin-tee concrete structure. The main floor will provide approximately 139,000 square feet of usable space. An additional 31,000 square feet of floorspace will be provided by a mezzanine.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Consolidated nonnuclear manufacturing facility, Rocky Flats Plant, Golden, Colorado	2. Project No.: 84-D-114
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8. Brief physical description of project (contd.)

Interior firewalls will be built of concrete masonry or double-layered gypsum board. Other walls will be of metal stud demountable construction. Offices, corridors, conference rooms, and laboratories will be provided with suspended acoustical tile ceilings. Fabrication, assembly, utility, and inspection areas will have exposed structural ceilings except for special modular laboratories which require temperature and humidity controls.

Special modular cubicles having reinforced concrete walls and ceilings will be built on the main floor. Eight concrete laboratory modules approximately 19 by 34 feet will be provided with temperature, humidity, and dust controls. These will be equipped for assembly operations, inspection procedures, and standards control. Additional concrete cubicles will include twelve 12 by 20 foot fabrication and test cells. These will have reinforced walls for protection against test-generated shrapnel. One 16 by 16 foot x-ray vault, five 12 by 12 foot x-ray vaults, and one 12 by 20 foot holography cell will have 24-inch-thick walls of concrete designed for radiation shielding.

Isolated rooms with special ventilation and air scrubbers will be provided for electrochemical milling machines.

Equipment to be installed in the new manufacturing building will consist primarily of production machines and equipment currently located in two existing overcrowded, structurally inadequate buildings. This includes approximately 133 machine tools and other process and production support facilities which will be relocated to inspection, nondestructive testing, and standards laboratories. Approximately 75 existing machine tools currently located in hazardous material production areas will be installed in the new building after thorough surface cleaning.

Approximately 75 new production equipment items to be procured under individual weapon systems line items for their individual production needs will be installed in the new building. About 16 new machines procured under current equipment restoration projects will be installed in the new building.

All production machines and equipment will be removed from the existing Manufacturing and General Support Building (Building 881) vacating a 66,500-square-foot area which will be renovated for other uses. Renovation will consist of general refinishing, installation of demountable partitions, drop ceilings, and recessed lighting. The existing ventilation system will be rehabilitated. The building interior will be reconfigured for use as laboratories, shops, and offices to accommodate support, research and development, engineering, and minor shop functions.

A new 16-by-18-foot guard post will be built at the security fence line for access control to the new manufacturing building. The guard post will be provided with electric heat, fluorescent lighting, telephone service, radio communications, and sanitary facilities.

Utilities to be provided include piping systems, new power equipment and associated power distribution system, fire and security detection systems, and a new cooling tower.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Consolidated nonnuclear manufacturing facility,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 84-D-114

8. Brief physical description of project (contd.)

Piping will provide domestic water and fire protection for the new manufacturing building. Deionized water will be supplied to laboratories and test areas. Cooling water will be provided for machines and air-conditioning equipment. Sanitary sewers and process waste lines will be connected to existing mains. Welding and process gases will be provided to fabrication and test facilities, as required. A central hydraulic system will provide service to the tracer lathes. A central filtered coolant and a chuck vacuum system will be provided for machining operations.

A new 250-ton capacity cooling tower with about 1,200 gallons per minute circulating capability will be built complete with associated pumps, piping, and controls. This cooling tower will provide cooling water for equipment and air-conditioning system chillers. It is independent of the evaporative cooling system which will serve the main manufacturing area.

Electrical power for the new manufacturing building and supporting structures will be supplied from a power equipment and distribution system. Motor control centers will be furnished to power motors of one-half horsepower or greater. Emergency power systems will be furnished to provide power for test equipment, security lighting, security alarms, and other equipment, as required.

Standard equipment to be provided by this project includes building cranes; compressors; and furniture for offices, laboratories, a conference room, and a cafeteen.

The requested FY 1985 funding will complete the facility.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide suitable working space essential for the production of nonnuclear weapons components at the Rocky Flats Plant.

Existing manufacturing buildings are overcrowded. Nonnuclear manufacturing at Rocky Flats is performed in two major buildings, Building 881 (Manufacturing and General Support Building) and Building 444 (Production Shop). These buildings were at capacity in late 1981. The current Nuclear Weapons Production and Planning Directive approved by the President calls for a steady increase in production rates.

This project provides for expansion of the Rocky Flats nonnuclear manufacturing capability by providing a new building and by reorganizing and rehabilitating existing overcrowded nonnuclear manufacturing space. Equipment and production support facilities, such as nondestructive testing equipment, will be removed from existing space and reinstalled in the new building. Space will be provided in the new building to accommodate dedicated nonnuclear production equipment provided by current weapon line item construction projects. Approximately 22,000 square feet of additional production floorspace will be provided in the new building to support war reserve production planned for the next 10 years. Vacated manufacturing space in existing Building 881 will be converted to laboratories, shops, and offices.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Consolidated nonnuclear manufacturing facility,
Rocky Flats Plant, Golden, Colorado	2. Project No.: 84-D-114

9. Purpose, justification of need for, and scope of project (contd.)

Building 881, built in 1953 for other uses, has been gradually changed over to general support and nonnuclear manufacturing activities. The building is structurally not suited to high-density machinery operations. New equipment acquired to increase production capability and capacity and larger equipment acquired to replace obsolete equipment cannot be accommodated within existing manufacturing areas. Precision machines currently installed in this building are experiencing substantial vibrations. To dampen these vibrations, the floors have been braced from the underside. Inefficient production has resulted, schedules are missed, scrap is increased, and machine time is lost. FY 1982 production requirements are being met with difficulty by this facility. To meet production requirements until 1985, when the new consolidated nonnuclear manufacturing facility will be available, it will be necessary to reorganize and remove some support activities from the building, lease offsite space for a chemical instrumentation group, and convert the cafeteen to production space.

Building 444 currently provides facilities for production of components using radioactive, pyrophoric, and toxic materials, as well as production of nonradioactive and hazardous materials. Vanadium, depleted uranium, and other nonradioactive materials are machined in the same area and frequently on the same equipment. Mixing the manufacturing of radioactive and nonradioactive components raises the number of people who are unnecessarily exposed to radioactive and toxic material. Scrap from the current operation contains radioactive material and requires disposal as nuclear waste. Relocating nonradioactive production operations (stainless steel, aluminum, and vanadium) to the new manufacturing building would significantly reduce the number of people exposed to radiation and the amount of contaminated scrap.

The production area dedicated to nonradioactive production operations in Building 444 is approximately 15,000 square feet. During the next four years, an additional 8,500 square feet will be required. In order to obtain space prior to the availability of the new consolidated nonnuclear manufacturing facility, production facilities will be expanded into the precision tool grinding shop which will be relocated into the cafeteen, which will be closed, and into space vacated by tool engineering and production control and scheduling activities. In addition, production schedules will be increased from two shifts to three shifts per day, as required.

To meet current production space requirements in Building 444, support functions have been removed from the building and office spaces have been converted to manufacturing.

In 1981, approximately 300 people were relocated to obtain production space in the above building. Some are located in temporary buildings onsite, and approximately 225 are located in leased space approximately 12 miles from the Rocky Flats Plant. The cost to the Government for this lease is currently \$1,100,000 per year.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Consolidated nonnuclear manufacturing facility,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 84-D-114

9. Purpose, justification of need for, and scope of project (contd.)

space involve processing classified material with the plant's main computer and could not be appropriately relocated offsite. An offsite manufacturing facility would require acceptable security since classified parts would be processed. In addition, it is doubtful that an offsite manufacturing facility could be found that would also provide the necessary concrete cells needed for physical testing and x-ray procedures. Considering current interest rates and Government guidelines limiting lease rates to no more than 15 percent of the appraised value per year, it is doubtful that the Government could have a lease facility built to fill our special needs. Subcontracting for piece-part manufacturing by offsite vendors (machine shops) is continuously considered as a potential means of meeting production schedules. Rocky Flats has made a concentrated effort over the past five years to develop qualified "Q"-cleared manufacturing businesses. Two qualified shops have been cleared to date. Both shops are heavily loaded. Additional outside vendors will be required and are being sought.

Current workload projections and assessment of the production space available at the Rocky Flats Plant to meet the required schedules clearly establishes the need for the new consolidated nonnuclear manufacturing building.

Plans have been made to relocate personnel and functions temporarily until the new building can be completed. Every effort will be made to place the new building in operation by the middle of FY 1985 so that the Rocky Flats Plant can meet the production schedules for the peak years 1986 through 1989. Renovation of space vacated in Building 881 will permit return of personnel from offsite accommodations.

A reduction in the cost estimate reflects adjustments made due to current lower-than-anticipated inflation rates for construction.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 16% of construction costs, item b		\$ 5,100
b. Construction costs		31,960
(1) Improvements to land	\$ 880	
(a) Lighted parking lot approximately 210,000 square feet at about \$4 per square foot ..	\$ 840	
(b) Lighted security fencing	40	

a/ Estimate is based on completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Consolidated nonnuclear manufacturing facility,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 84-D-114

10. Details of cost estimate a/

	Item cost	Total cost
(2) Buildings	13,160	
(a) Basic manufacturing building with mezzanine, approximately 170,000 square feet at about \$73 per square foot	11,970	
(b) Renovation of existing building, approximately 66,500 square feet at about \$17 per square foot	1,120	
(c) Guard post	70	
(3) Special facilities	15,430	
(a) Test cells, x-ray vaults, laboratories, and concrete structures with climate controls	11,680	
(b) Relocation of production equipment, machinery, and testing systems	3,750	
(4) Utilities, including electrical power and distribution system, cooling tower, piping and services to new building, and utilities for guard post	2,490	
c. Standard equipment		2,710
	Subtotal	39,770
d. Contingency at approximately 14% of above costs		5,430 b/
	Total estimated cost	\$45,200

11. Method of performance

General engineering design and inspection will be performed under a negotiated architect-engineer contract. The building will be built under a fixed-price, design-construct contract awarded on the basis of competitive bidding. Other construction will be accomplished by a fixed-price contract awarded on the basis of competitive bidding. Procurement of long-lead delivery items will be accomplished by the operating contractor under an existing cost-type contract. Equipment relocation and installation will be accomplished by a construction contractor under an existing cost-type contract.

a/ Estimate is based on completed conceptual design.

b/ Contingency applies to work to be performed during FY 1984 and FY 1985.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Consolidated nonnuclear manufacturing facility,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 84-D-114

12. Pending schedule of project funding and other related funding requirements

	Prior Years	FY 1985	Total
a. Total project funding			
1. Total facility costs			
(a) Construction line item	\$18,400	\$26,800	\$45,200
Total facility costs	18,400	26,800	45,200
2. Other project funding			
(a) Conceptual design	28	0	28
(b) Preliminary engineering and design	600	0	600
Total other project funding	628	0	628
Total project funding (items 1 and 2)	\$19,028	\$26,800	\$45,828
b. Other related funding requirement (estimated life of project: 10 years)			
1. Facility operating cost			\$ 4,250
2. Programmatic operating expenses directly related to the facility			57,100
Total other related funding requirements			\$61,350

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
1. Other project funding
- (a) Conceptual design was prepared by the Rocky Flats Plant operating contractor at a cost of \$28,000.
- (b) Design criteria, additional feasibility and conceptual studies, and design-construct documents for soliciting for the building shell will be prepared using FY 1983 operating funds.
- b. Other related funding requirements
1. Facility operating costs
- (a) Facility operating costs are projected to cover the cost of utilities, maintenance, janitorial services, and related overhead.
2. Programmatic operating expenses directly related to the facility
- (a) Programmatic operating expenses are projected to cover direct labor, fringe benefits, production materials, and supplies and related overhead.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Electrical system expansion,
Pantex Plant, Amarillo, Texas	2. Project No.: 84-D-115
3. Date A-E work initiated: 2nd Qtr. FY 1984	5. Previous cost estimate: \$15,000
Date: 1/83
3a. Date physical construction starts: 2nd Qtr. 1985	6. Current cost estimate: \$14,600
Date: 1/84
4. Date construction ends: 1st Qtr. FY 1989	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1984	\$ 1,500	\$ 1,500	\$ 1,500	\$ 900
1985	10,000	10,000	10,000	3,000
1986	3,100	3,100	3,100	6,000
1987	0	0	0	3,500
1988	0	0	0	1,200

8. Brief physical description of project

This project provides for expansion of the electrical utility equipment and electrical distribution system at the Pantex Plant, Amarillo, Texas. The project will provide a new transmission line, new distribution lines, new underground ducts, conversion of selected existing overhead distribution systems to underground distribution, and emergency generators and will modify selected motor control centers and panels within existing buildings.

A new electrical power transmission line will connect existing transmission lines to form a loop that will serve existing plant substations. Approximately 15,000 feet of new 115,000-volt line shall be connected to existing lines within the plant property owned by the local utility and to Government-owned transmission lines that feed the plant substations. The new line will conform to industry standards and will be compatible with local weather conditions. Conductors will be three 4/0 aluminum cables (steel reinforced) supported on typical 60-foot, wooden pole, H-frame structures. Each pole will be equipped with single-strand, static-grounding wire; and two-stranded, galvanized steel cables between the power line supports will provide static-grounding protection.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Electrical system expansion,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-115

8. Brief physical description of project (contd.)

Circuit breakers and controls will be installed at strategic locations to isolate sections of the new line during faulted circuit conditions. Approximately 26,000 feet of existing transmission line will be modified to meet industry standards and will be incorporated in the loop system.

Underground 12,000-volt electrical distribution ducts will be built in the main plant production and production support areas (Zone 12) and in the main development area (Zone 11). The new underground ducts will provide added electrical loops for redundant electrical distribution to existing facilities and buildings. Approximately 18,500 linear feet of new underground duct will be built. Typical underground duct will consist of concrete-encased, polyvinyl chloride plastic pipe buried 4 feet below grade. Approximately 50 standard monolithic manhole units will be installed at corners and bends in the duct to accommodate connections to plant building feeder circuits. The underground duct construction will include installation of transfer switches, modifications to existing switchgear, transition facilities to the existing 15,000-volt distribution system, and connections to existing substations. The new underground duct system will complete an electrical feeder loop in the southeast production area by connecting with existing underground ducting. Electrical service to buildings in the production and production support areas will be converted from the 12,000-volt overhead distribution system to an underground system. This will bring the power supply into compliance with policy for production facilities. Conversion will provide new underground duct, single- and double-ended substations, and switchgear to serve the buildings. Approximately 14 transformers and 14 transfer switches will be installed. In the Zone 12 production support area, the new 12,000-volt duct system will connect the underground loop system to existing substations and will provide feeder circuits to existing buildings. In the development area, Zone 11, the new underground duct will interconnect high-priority buildings.

The staging area, Zone 4, will be provided with an alternate 12,000-volt distribution overhead power line. New switchgear and a segment of overhead power lines will be installed to connect a 12,000-volt distribution line nearby with the Zone 4 distribution system. Modification of an electrical service line to the plant's west water tower will include partial replacement of poles and modification of crossarms and hardware.

Motor control centers and building power distribution panels will be installed in approximately 13 buildings located in the production and development zones. Approximately 270 panels are included in this project. However, the exact locations and numbers of motor control centers and panels will be refined by ongoing site master planning efforts.

A new 40-kilowatt generator with associated underground fuel tanks, automatic transfer switch, and transformer will be installed in the north end of the production support area to provide security lighting under emergency conditions. A 75-kilowatt generator with associated fuel tanks and appurtenances will be installed in the development area to provide emergency security lighting.

The requested FY 1985 funding will be used for construction of the new facility.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Electrical system expansion,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-115

9. Purpose, justification of need for, and scope of project

This project will provide additional power distribution facilities to meet a projected doubling of peak demand by 1989 and will improve the reliability of the entire plant distribution system. The improvements are needed to ensure reliability of electrical power to production facilities and to permit isolating and deenergizing parts of the system for repair and maintenance. At present, most of the overhead distribution system cannot be deenergized for repair and maintenance without power shutdowns on production activities. Repairs must be made on "live" circuits. For lack of alternative distribution circuits, preventative maintenance is delayed and electrical transmission equipment must perform beyond expected cycles of maintenance.

200 A single main power line that feeds the Pantex Plant and the existing overhead distribution system that serves part of the production area was built in 1952. Existing underground power distribution facilities which serve part of the production area were built in 1970. The existing electrical system serving the Pantex Plant's operations is complex and involves some unsafe switching arrangements, some outdated motor control centers and panel boards, some overhead distribution lines that have reached their design life, and some direct burial cable systems which are uneconomical to repair. Authorized restoration projects have replaced essentially all the poor and inadequate elements in this electrical system. This project will augment the restoration work on the electrical system by upgrading and expanding the system to meet increasing power demands. Age is not a major justification for construction of new distribution facilities. Additional capacity and an alternative main power feeder are needed to ensure reliability and to permit deenergizing for preventative maintenance. The project will establish loop feeders to provide redundant power services for existing operations and new facilities. Added segments of electrical loops will provide redundant capability which will allow most plant operations to continue uninterrupted if a single component failure should occur and will permit isolation and repair of equipment without adverse effects on the weapons production commitments.

The present capacity of the existing power distribution systems is limited by primary transformer capacity of 17.5 MVA. The first of two primary transformers, a 7.5 MVA transformer, was installed as a part of the original power distribution system in 1952. A 10.0 MVA primary transformer was installed in FY 1970.

The following table of peakload projections shows that it is not now possible to deenergize the 10.0 MVA transformer for maintenance or repair and, after 1985, it would not be possible to deenergize either of these without additional transformer capacity. An additional primary 10.0 MVA transformer will be provided under Project 78-16-a, Cruise Missile Production Facilities, Various Locations; it is scheduled to be online in late 1986.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Electrical system expansion,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-115

9. Purpose, justification of need for, and scope of project (contd.)

CY	Projected Peakload (MVA)
1982	8.6
1983	9.5
1984	10.0
1985	11.5
1986	12.4
1987	13.6
1988	15.9
1989	19.0
1990	19.5
1991	19.9
1992	20.3

This project, scheduled for completion in late 1987, will upgrade the reliability and capacity of the power distribution system by adding an alternative transmission line and new distribution facilities.

The proposed additions and modification of the 115,000-volt transmission line will complete a looped-circuit feeder that will reduce the frequency of power outages and shorten their durations.

The underground duct systems will improve reliability of the existing power service by providing required redundancy and will provide additional power distribution capacity. Added segments of underground duct will complete loop circuits in the existing distribution system. Existing direct-buried distribution lines have been a source of interruption in operations due to difficulties in locating faulted conditions and time-consuming excavation involved in repair. To correct this problem, the direct-buried distribution system will be replaced by an underground duct system which will concurrently provide increased capacity for this area.

A new overhead distribution line for the staging area will increase the reliability of power service in an area served by only one power source.

Security lighting during power failures will be ensured by installation of new emergency generators. Existing undersized emergency generators will be replaced.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Electrical system expansion,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-115

9. Purpose, justification of need for, and scope of project (contd.)

A site master planning study currently in progress and scheduled for completion in 1984 will identify as essential much of the work to be completed by this project. This project will accomplish electrical construction to be recommended in the master plan.

The reduction in the cost estimate reflects adjustments made due to current lower-than-anticipated inflation rates for construction.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 20% of construction costs, item b		\$ 2,100
b. Construction costs		10,600
(1) Utilities		
(a) Transmission line	\$1,700	
(b) Underground ducts	7,550	
(c) Overhead distribution line	320	
(d) Motor control centers and building power panels	950	
(e) Emergency generator installations	80	
	Subtotal	12,700
c. Contingency at approximately 15% of above costs		1,900 b/
	Total estimated cost ...	\$14,600

11. Method of performance

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

a/ Based on completed conceptual design.

b/ Contingency applies to work to be performed during FY 1984, FY 1985, FY 1986, FY 1987, and FY 1988.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Electrical system expansion,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-115

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>Total</u>
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$ 900	\$ 3,000	\$ 6,000	\$ 3,500	\$ 1,200	\$14,600
Total facility costs	900	3,000	6,000	3,500	1,200	14,600
2. Other project funding						
(a) Conceptual design	25	0	0	0	0	25
Total other project funding	25	0	0	0	0	25
Total project funding (items 1 and 2)	\$ 925	\$ 3,000	\$ 6,000	\$ 3,500	\$ 1,200	\$14,625
b. Other related funding requirement (estimated life of project: 20 years)						
1. Facility operating cost						\$83,000
Total other funding requirements						\$83,000

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

Conceptual design for this project was prepared by the operating contractor at a cost of \$25,000.

b. Other related funding requirements

It is estimated that the programmatic life of this facility will be 20 years.

1. Facility operating costs

Facility operating costs of \$83,000 per year are projected. This includes maintenance, labor, materials and supplies, plus janitorial and utility services.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Inert assembly and test facility,
Pantex Plant, Amarillo, Texas	2. Project No.: 84-D-117
3. Date A-E work initiated: 2nd Qtr. FY 1984	5. Previous cost estimate: \$13,600
Date: 1/83
3a. Date physical construction starts: 3rd Qtr. FY 1985	6. Current cost estimate: \$13,200
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1986	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1984	\$ 1,500	\$ 1,500	\$ 1,500	\$ 800
1985	11,700	11,700	11,700	4,400
1986	0	0	0	8,000

8. Brief physical description of project

This project provides a new building for use in assembling and testing inert (nonnuclear) warheads and a covered walkway (ramp) connecting to adjacent facilities.

A new 47,000-square-foot, high-bay building will be built at the Pantex Plant. The new building will be a single-story, manufacturing building with mezzanines for offices and part of the mechanical equipment. Ceiling height in the work areas will be 22 feet. The building will be constructed of reinforced concrete. A firewall will be provided to isolate the maximum fire loss to \$25,000,000. The new building will include a manufacturing area, a quality area, a software support room, a record storage area, a mechanical equipment room, offices, a combustible storage area, a break area, a janitor's closet, and restrooms.

The manufacturing area will provide about 9,600 square feet of work space and 3,200 square feet of storage area. The manufacturing space will be divided into work areas. Each work area will be provided with an air-operated, 1,000-pound capacity bridge crane and hoist. Each work area will be provided with compressed air, vacuum, and electrical outlets. Movable exhaust systems will be provided for use in gluing operations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Inert assembly and test facility,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-117

8. Brief physical description of project (contd.)

The quality area will include eight 25-by-30-foot work areas. Four jib cranes and hoists with 1,000-pound capacities will service the quality area. Compressed air, vacuum, and electrical outlets will be located throughout the area.

Support areas will provide working space for the staging of parts and tools, line supervision offices, computer software, and record storage.

Protected passage from the building to adjacent facilities will be provided by a covered walkway (ramp) approximately 120 feet long. This will be a preengineered metal structure approximately 18 feet wide. The floor will be sealed concrete. Lights, emergency lights, and lightning protection will be provided.

Heating and air-conditioning systems will maintain environmental conditions in the manufacturing and quality areas, offices, combustible storage areas, software support areas, and record storage areas. In the work and storage areas the temperature will be controlled by water chillers and optimum heat sources to $73^{\circ}\text{F} + 3^{\circ}$, and the relative humidity will be controlled to 15 percent. The remainder of the building will be controlled to 78° in the summer and 68° in the winter. Process vacuum and compressed air will be supplied from pumps and compressors installed in the mechanical rooms. The building will be protected by an automatic wet-pipe sprinkler system.

Special facilities included in this project include portable shields to screen off-work areas where small quantities of high explosives (up to 0.5 pounds) are present. Missile protection will be provided for personnel working in other parts of the facility. A life-cycle cost analysis was performed on an energy conservation scheme for this building which includes a solar collector, additional insulation, an automated energy management system, and efficient lighting. The estimated additional project cost attributable to energy conservation measures and solar energy augmentation is \$295,000. The value of energy that can be saved by the energy conservation scheme over the life of the building is estimated at \$1,600,000. A parabolic solar collector system is included in the special facilities planned for this building.

Utilities will be provided by extending existing services, including water lines, electrical distribution lines, telephone, public address, fire alarm, and security alarms.

Standard equipment will include bridge cranes, jib cranes, hoists, forklifts, handlifts, storage shelving, work tables, and office equipment.

The requested FY 1985 funding will be used for construction of the new facility.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide additional capacity to assemble and test inert (nonnuclear) warheads. This additional capacity is essential to meet existing production commitments after FY 1986.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Inert assembly and test facility,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-117

9. Purpose, justification of need for, and scope of project (contd.)

An integral part of the nuclear weapons production program at the Pantex Plant includes the building of some inert or mock nuclear weapons. These contain no fissile materials and no significant quantity of high explosives. Most of these inert weapons are required for use in the DOE/DOD quality assurance program for operational and vulnerability testing and for training. Many of these inert weapons, called Joint Test Assemblies (JTA), are configured for use in firing test programs and for drop test programs conducted by the DOD. A JTA unit is comprised of war reserve weapon components, plus one or more subassemblies (such as telemetry units) substituted for the critical components.

The physical appearance and characteristics of an inert weapon approximates a war reserve weapon. Some JTA's are rebuilt using war reserve weapons recalled from the stockpile, subsequently disassembled, and reassembled in an inert configuration with subassemblies appropriate to the intended use. Some JTA's are prebuilt as new production units and shipped to the stockpile for typical storage and handling. Some inert "type" weapons are built for training military personnel in handling, arming, and firing the war reserve weapon.

Currently, inert weapons are assembled and tested in the same facilities used for production of war reserve nuclear weapons. Existing facilities for assembling and testing nuclear warheads are at maximum utilization and will require extensive rearrangements and operational changes to support the weapon systems entering production in FY 1985. Temporary changes have been scheduled to help overcome the lack of capacity through FY 1986.

To meet new commitments beyond FY 1985, additional assembly and testing capacity must be obtained. Most of the weapon systems in the stockpile and in production have active requirements for inert warheads. As new weapons programs enter production, the requirement for inert warhead assemblies increases. It is now appropriate to separate the preparation of inert warheads from war reserve production to relieve overcrowding and, at the same time, remove some personnel from unnecessary exposure to danger from potential accidents associated with assembling hundreds of pounds of high explosives and kilogram quantities of fissile material. The new stockpile assurance facility will provide workspace for 100 persons and significantly relieve the production capacity problem at the end of FY 1986.

The reduction in the cost estimate reflects adjustments made due to current lower-than-anticipated inflation rates for construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Inert assembly and test facility,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-117

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 20% of construction costs, item b		\$ 1,850
b. Construction costs		9,280
(1) New building, approximately 47,000 square feet at about \$165 per square foot	\$ 7,520	
(2) Other structures, covered walkway	60	
(3) Special facilities, including solar collector system	1,540	
(4) Utilities	160	
c. Standard equipment		530
	Subtotal	11,660
d. Contingency at approximately 13% of above costs		1,540 b/
	Total estimated cost ...	\$13,200

11. Method of performance

Design and inspection will be performed under a negotiated architect-engineer contract. Construction will be accomplished by a fixed-price contract awarded on the basis of competitive bids. The operating contractor will procure and install selected equipment items.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item.....	\$ 800	\$ 4,400	\$ 8,000	\$13,200
Total facility cost	800	4,400	8,000	13,200
2. Other project funding				
(a) Conceptual design	60	0	0	60
Total other project funding	60	0	0	60
Total project funding				
(items 1 and 2)	\$ 860	\$ 4,400	\$ 8,000	\$13,260

a/ Based upon completed project design.

b/ Contingency applies to work to be performed during FY 1984, FY 1985, and FY 1986.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Inert assembly and test facility, Pantex Plant, Amarillo, Texas	2. Project No.: 84-D-117
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12. Funding schedule of project funding and other related funding requirements (contd.)

b. Other related funding requirements (estimated life of project: 15 years)	
1. Facility operating costs	\$ 520
2. Programmatic operating expenses directly related to the facility	2,540
Total other related funding requirements	<u>\$ 3,060</u>

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design

The only funding in this category is the \$60,000 spent for conceptual design of this project in preparation for budget submittal.

b. Other related funding requirements

It is estimated that the programmatic life of this facility will be at least 15 years.

1. Facility operating costs include utilities, plus labor, material, and supplies for maintenance and janitorial services.
2. Programmatic operating expenses include the personnel costs for those assigned to work in the facility, plus \$40,000 for minor materials and supplies.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: High explosive subassembly facility,
Pantex Plant, Amarillo, Texas	2. Project No.: 84-D-118
3. Date A-E work initiated: 2nd Qtr. FY 1984	5. Previous cost estimate: \$60,000
Date: 1/83
3a. Date physical construction starts: 3rd Qtr. FY 1985	6. Current cost estimate: \$57,000
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1987	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1984	\$ 7,000	\$ 7,000	\$ 7,000	\$ 5,000
1985	40,000	40,000	40,000	10,000
1986	10,000	10,000	10,000	23,000
1987	0	0	0	19,000

8. Brief physical description of project

This project consists of the design and construction of a 16-unit high explosive subassembly bay complex at the Pantex Plant, Amarillo, Texas, which will become part of a 36-unit high explosive subassembly bay complex planned to accommodate future workload increases. The 16-unit complex will include high explosive subassembly bays, tool staging areas, inert materials staging areas, corridors, ramps, equipment rooms, fan buildings, restrooms, supervisory office space, and break rooms. In addition to design and construction of the initial 16 units, this project will provide engineering planning effort necessary to establish a layout for the entire 36-unit complex, identifying necessary utility relocations, locating and sizing new utilities, and access requirements. Based on this effort, the building site will be laid out and reserved for the 36-unit complex. Construction under this project will provide for completion of a 16-unit complex appropriately located and provided with utilities and access sized to permit later extension to accommodate the 36-unit facility, when and if authorized.

Site preparation will include site grading to provide surface drainage for the 16-unit subassembly bay complex. Reinforced concrete pipe culverts will be installed at ramp and road crossings. Approximately 2,000 feet of temporary security fencing will be installed around the construction site. Demolition of a small segment of existing covered walkway (ramp) will be necessary to provide for connection with the new facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: High explosive subassembly facility,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-118

8. Brief physical description of project (contd.).

The 16 subassembly bays with supporting staging areas, equipment rooms, and offices will be built as an integrated reinforced concrete structure of approximately 56,000 square feet in gross area. Each subassembly bay will contain approximately 1,600 square feet of usable floor space. The subassembly bays with blast doors, interlocks, security doors, and vestibules will be totally noncombustible. The subassembly bays will be earth-covered and sealed with an asphalt liner to provide erosion control. Environmental controls will be provided to maintain the working area at $73^{\circ}\text{F} \pm 3^{\circ}\text{F}$, with a maximum absolute humidity of 15 grains per pound of dry air. Each bay will be designed for Class II hazard operations as defined in DOE Order 6430, Chapter XXII. The design will provide for up to 300 pounds of high explosive in each bay and will recognize recently completed physical tests made on earth-covered assembly bays to obtain design information pertaining to compliance with current DOE safety criteria. Each bay will be provided with a hoist with powered bridge and trolley. High explosive subassembly operations in these bays may involve special nuclear materials; therefore, radiation monitoring equipment may be installed in part or all of the bays.

Support facilities directly associated with the 16 subassembly bays include a fan building (1,500 square feet) on the bay roof, combustible storage area (2,600 square feet), corridors (7,700 square feet) and inert materials and tester staging areas, mechanical and electrical room, break areas, restrooms, and quality and manufacturing areas (5,400 square feet).

Approximately 1,200 lineal feet of covered walkway (ramp) will be required to join the 16-unit subassembly bay complex with the manufacturing areas and the weapon assembly areas. This structure will be approximately 17 feet wide and 13 feet high and will consist of a preengineered metal building structure on a 6-inch concrete slab.

Utilities include a sanitary sewer, fire protection, a water distribution system, and a new electrical distribution system. The electrical system will include a new underground primary service and transformers. Utilities will be sized to handle the requirements of the complete 36-unit complex, when and if extended. Provision is made in this project for energy conservation. Energy-efficient lighting will be used in the facility. An automated energy management system will be connected to the heating, ventilating, and air-conditioning system to reduce ventilation rates and dehumidification during unoccupied periods. The building will have no windows. Direct exits from the building are for emergency exit only. The percent of fenestration to gross wall is about 3 percent. A life cycle cost analysis indicates significant merit in including major energy conservation features in this project. Projected energy use reduction based on a solar collection system considered in the conceptual design indicates a potential for cost savings of about \$3,000,000 over the life of the building at a cost for energy conservation and renewable energy facilities estimated at \$1,300,000.

Standard equipment will include two electric forklifts with batteries, building hoists, and equipment installed.

The requested FY 1985 funding will be used for site preparation and for construction of major buildings in the 16-unit high explosive subassembly bay complex.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: High explosive subassembly facility,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-118

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide design and construction of 16 additional high explosive subassembly bays needed to meet weapon production workload projections starting in the third quarter FY 1987. Currently, there are 24 subassembly bays at the Pantex Plant. Beginning in the third quarter of FY 1987, a total of 40 subassembly bays will be required. Based on future weapons production workload projections (beyond FY 1987), it is anticipated that a total of 60 subassemblies and assembly bays will be required to support a 5-day-per-week, 2-shift-per-day operation. Therefore, site planning for the 16 subassembly bays will include provisions for a 36-unit complex.

All of the new weapons systems scheduled will require additional subassembly and assembly bays. The safety criteria and work areas for both types of structures are very similar. In order to provide facilities with flexibility for either function, design criteria for assembly bays will be adopted for the new subassembly bays. It is apparent that any delay in the completion progress of the initial 16-unit subassembly complex will require operating the existing subassembly facilities on an extended work week. Conservative estimates of leadtimes for design and construction of the initial 16-unit complex indicate that these facilities may not be fully operational until the second quarter of FY 1988. Additional work shifts for short periods are an acceptable working technique.

The reduction in the cost estimate reflects adjustments made due to current lower-than-anticipated inflation rates for construction.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 25% of construction costs (16-unit subassembly complex), plus planning for a 36-unit complex		\$ 9,500
b. Construction costs		38,500
(1) Improvements to land	\$ 950	
(2) Buildings, reinforced concrete, earth-covered, approximately 73,000 square feet at \$460 per square foot	31,900	
(3) Special facilities, including solar collectors	950	
(4) Ramp	1,900	
(5) Utilities	2,800	
c. Standard equipment		1,400
	Subtotal	49,400
d. Contingency at approximately 15% of above costs		7,600 b/
	Total estimated cost ...	\$57,000

a/ Based upon a completed conceptual design.

b/ Contingency applies to work to be performed during FY 1984, FY 1985, FY 1986, and FY 1987.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: High explosive subassembly facility,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-118

11. Method of performance

Design and inspection will be performed under a negotiated architect-engineer contract. Construction will be accomplished by fixed-price contracts awarded on the basis of competitive bidding. Construction will be administered by a construction management firm under contract to the DOE. Minor equipment procurement and installation will be performed by the operating contractor who will also complete communications and detection system installation.

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 5,000	\$ 10,000	\$ 23,000	\$ 19,000	\$ 57,000
Total facility costs	5,000	10,000	23,000	19,000	57,000
2. Other project funding					
(a) Conceptual design	130	0	0	0	130
Total other project funding	130	0	0	0	130
Total project funding (items 1 and 2)	\$ 5,130	\$ 10,000	\$ 23,000	\$ 19,000	\$ 57,130
b. Other related funding requirements (estimated life of project: 30 years)					
1. Facility operating costs					\$ 880
2. Programmatic operating expenses directly related to the facility					2,000
Total other related funding requirements					\$ 2,880

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design

Conceptual design cost of approximately \$130,000 will be incurred in the process of developing and improving the project cost estimate and schedule.

b. Other related funding requirements

It is estimated that the programmatic life of these facilities will be at least 30 years.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: High explosive subassembly facility, Pantex Plant, Amarillo, Texas	2. Project No.: 84-D-118
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13. Narrative explanation of total project funding and other related funding requirements (contd.)

1. Facility operating costs

Approximately \$880,000 per year will be spent to cover the cost of utilities, maintenance, janitorial services, and related overhead costs.

2. Programmatic operating expenses directly related to the facility

The annual cost of direct labor, overhead, and minor materials and supplies is estimated at \$2,000,000 per year while operating at full production.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Railroad track replacement and upgrade,
Pantex Plant, Amarillo, Texas	2. Project No.: 84-D-119
3. Date A-E work initiated: 2nd Qtr. FY 1984	5. Previous cost estimate: \$7,800
Date: 1/83
3a. Date physical construction starts: 3rd Qtr. FY 1985	6. Current cost estimate: \$7,600
Date: 1/84
4. Date construction ends: 3rd Qtr. FY 1987	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1984	\$ 800	\$ 800	\$ 800	\$ 400
1985	6,800	6,800	6,800	1,600
1986	0	0	0	3,700
1987	0	0	0	1,900

8. Brief physical description of project

This project will increase the load-carrying capacity of the railroad track system serving the Pantex Plant, Amarillo, Texas. The existing railroad track, built in 1942 as part of a World War II ordnance plant, is extensively deteriorated by age and use and requires substantial reconstruction to handle present and projected loadings. This project will realign the track system adding a 2.6-mile-long new lead track connecting to the carrier's mainline; rebuilding about 4 miles of existing track for greater load-carrying capacity; and demolishing about 9.1 miles which will be excluded from the realigned system.

Site work will include clearing the right-of-way of all vegetation and improvement of drainage by provision of ditches and culverts. The right-of-way will be fenced, and openings will be provided for local access.

The roadbeds for the new track and for the replacement of the old track will be filled with compacted earth material. The minimum subgrade width will be 17 feet 6 inches at the top. Ballast will be crushed limestone with a minimum of 8 inches between subgrade and ties. Hardwood, creosote-treated crossties will be used. New 136-pound-per-yard rail will be used for the new track. New track construction will include the necessary switches, tie plates, joint bars, anchors, etc.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Railroad track replacement and upgrade,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-119

8. Brief physical description of project (contd.)

The existing lead track will be of no further use and will be removed.

The FY 1985 funding requested will complete this project.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to eliminate serious deficiencies in the existing railroad track system that serves the Pantex Plant.

The Pantex nuclear weapons assembly plant was established early in the 1950's on the site of a World War II ordnance manufacturing plant built in 1942 and closed in 1946. The original railroad track system was apparently designed for temporary service and involved the use of used track and associated hardware. When the plant site was reactivated for work on nuclear weapons, additional track was laid, again using used materials.

Over a period of nearly 40 years, the existing trackage has seriously deteriorated, while concurrently the loading requirements at the plant have increased. The original drainage, if provided, has ceased to exist. The roadbed is generally deteriorated. The lightweight track, mostly 80- and 85-pound-per-yard rail, is not safe or satisfactory for the loads currently imposed by the 180-ton and 115-ton locomotives used to transport ATMX safe/secure railcars. An ultrasonic examination was performed on all tracks during 1981. Approximately 80 flaws were identified; about one-third of these are considered serious defects. Derailment accidents to date have involved only locomotives; no sensitive cargo-carrying units have been derailed. The Santa Fe Railroad Company restricts the speed of their equipment on the DOE track to very slow, 5 to 10 miles per hour, because of the poor track condition.

A steam plant, to be centrally located in the Pantex Plant, is under design to convert plant heating requirements from oil and gas fuel to coal and to generate part of the plant's electrical power requirements. The current project schedule calls for a new central power plant equipped for the cogeneration of electric power to go into service by 1990. Natural gas will be the initial fuel. However, the boilers will be designed for later conversion to coal burning. The coal trains required to stockpile fuel for this plant would exceed any loads currently imposed on the railroad track by weapons activities. Several coal trains per month will be required to fuel the new plant after FY 1987.

Economies in maintenance and repairs are expected with completion of this project. An estimated \$500,000 per year will be saved by elimination of about 9 miles of seriously deteriorated track.

The reduction in the cost estimate reflects adjustments made due to current lower-than-anticipated inflation rates for construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Railroad track replacement and upgrade,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-119

10. Details of cost estimate a/

	Total cost
a. Engineering, design, and inspection at approximately 16% of construction costs, item b	\$ 870
b. Construction costs, including approximately 6.6 miles of new and upgraded track	5,340
c. Removal cost, less salvage for approximately 9 miles of abandoned track	400
Subtotal	6,610
d. Contingency at approximately 15% of above costs	990 b/
Total estimated cost	\$7,600

11. Method of performance

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

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 400	\$ 1,600	\$ 3,700	\$ 1,900	\$ 7,600
Total facility cost	400	1,600	3,700	1,900	7,600
2. Other project funding					
(a) Conceptual design	25	0	0	0	25
Total other project funding	25	0	0	0	25
Total project funding (items 1 and 2)	\$ 425	\$ 1,600	\$ 3,700	\$ 1,900	\$ 7,625
b. Other related funding requirements (estimated life of project: 30 years)					
1. Facility operating costs					\$ 200
Total other related funding requirements					\$ 200

a/ Based upon completed conceptual design.

b/ Contingency applies to work to be accomplished in FY 1984, FY 1985, FY 1986, and FY 1987.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Railroad track replacement and upgrade,
Pantex Plant, Amarillo, Texas

2. Project No.: 84-D-119

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
 - 1. Other project funding
 - (a) Conceptual design

The estimated cost for completing the conceptual design for this project is \$25,000.

- b. Other related funding requirements

It is estimated that the programmatic life of this facility will be 30 years.

- 1. Facility operating costs

Facility operating costs estimated at \$200,000 per year include maintenance labor, materials, and supplies.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Explosive component test facility,
Mound Facility, Miamisburg, Ohio	2. Project No.: 84-D-120
3. Date A-E work initiated: 1st Qtr. FY 1984	5. Previous cost estimate: \$21,900
Date: 1/83
3a. Date physical construction starts: 4th Qtr. FY 1984	6. Current cost estimate: \$21,300
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1987	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1984	\$ 3,100	\$ 3,100	\$ 3,100	\$ 1,600
1985	16,900	16,900	16,900	6,500
1986	1,300	1,300	1,300	7,500
1987	0	0	0	5,700

8. Brief physical description of project

This project will provide a new single-story building of approximately 28,000 square feet. Construction will be tilt-up concrete walls. Space allocations will be made for three large, high explosive test cells (each 15 feet in diameter and 24 feet in length); for test engineering and administrative functions; and for additional small, self-contained test cells. A new electrical substation and necessary utility extensions will be provided. Existing magazines and storage facilities will be relocated.

Site preparation will include nominal relocation efforts to reroute two paved roads which cross the building site. Two 20-year-old storage buildings, each having approximately 1,800 square feet of floor space, will be removed and replaced at a nearby location. High explosives magazines near the new building site will be decommissioned or reduced in storage capacity for safety of the new explosive component facility.

The new explosive component building will be a single-story building approximately 280 feet long and 100 feet wide. Construction of the building will be load-bearing cast concrete, tilt-up walls with an ongrade concrete slab floor. It will house three large testing tanks, each about 15 feet in diameter and 24 feet in length, with exhaust systems terminating in a single-shared exhaust expansion chamber and emission control separator. The tanks will be set in shallow pits with independent

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Explosive component test facility,
Mound Facility, Miamisburg, Ohio

2. Project No.: 84-D-120

8. Brief physical description of project (contd.)

foundations. The use of pits for the testing tanks minimizes the ceiling heights required and facilitates utilization of the tanks. Approximately 20,000 square feet of the building will be allocated to test operations. This will include the large test tanks with adjacent control rooms and test preparation rooms. A large room will be equipped for single-point, self-contained testers. Service facilities immediately adjacent to the testing areas will include photographic development rooms and segregated high explosives and pyrotechnic preparation rooms. An electronics calibration standards laboratory, a tester fabrication area, and maintenance shops will be provided. Space will be provided for technicians' desks, files, and secure storage.

Engineering and administrative offices will be allocated approximately 2,500 square feet of space. The remainder of the building will be allocated to lobby, corridors, washrooms, change rooms, loading dock, and building support including mechanical equipment and janitorial.

230 A new inside 1,000 kVA unit substation will be provided for the new building. Power will be supplied via underground ducts to existing high-voltage underground lines about 160 feet from the building site. Electrical systems in all hazardous areas within the building will be explosion-proof construction. An extensive electrical "fail-safe" interlock system will be provided to insure the safety of all personnel and equipment in test firing operations.

Special facilities will consist primarily of the three large detonator test firing cells. Each cell will be a freestanding pressure vessel with no dependence on the surrounding building for structural integrity. Each test cell will be a modified cylinder designed to withstand pressures resulting from a 10-pound TNT equivalent detonation. Test cells will be welded steel construction, certified, and hydrostatically proof tested. Instrumentation and viewing ports for camera recordings will be provided. Access to the interior for test setup will be through a single personnel door. An air inlet will be provided near the top of the cell and an exhaust port will be located near the opposite end. Environmental controls will be provided to control noise and particulate-laden gas emissions. A large surge tank will be shared between all test cells to reduce gas pressure in the cell following a detonation. The surge tank will attenuate sound and settle particulates. Gases leaving the surge tank will be filtered through a baghouse and exhausted to the atmosphere. The surge tank, baghouse, and fan will be located outside at the rear of the building. Special equipment will include tester maintenance equipment, tester fabrication equipment, waveform digitalizing systems, automatic firing control systems, high-speed streaking cameras and related photographic equipment, automatic film processors, light source fiducial systems, thermal storage chambers, automatic mechanical function testers, and vibration table with automatic controls.

Utilities will include steam supplied from a central powerhouse, ordinary hazard wetpipe fire sprinkler systems, domestic water, and sanitary service.

The requested FY 1985 funding will be used for construction, procurement of specialized electronic equipment, and installation of special facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Explosive component test facility,
Mound Facility, Miamisburg, Ohio

2. Project No.: 84-D-120

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide a new facility for testing high explosive components manufactured at the Mound Facility for nuclear weapon systems. Reliability of these components is demonstrated by destructively testing a percentage of each explosive product produced.

Existing production test cells are inadequate and too few in number to support the current product development and assurance testing requirements. The original explosive component test facility was built in 1957 to support a single weapon system. Since then expansion required to meet the needs of each new weapon system was handled in a piecemeal add-on fashion. This previous support activity has since evolved into a highly complex, sophisticated resource for both development and product assurance testing. To further complicate this situation, the workload has increased substantially. The need for expansion of the existing capacity is critical and becoming urgent. Currently, existing test cells are too few in number and too outmoded in design to support both the current long-range product testing program and the new development and test programs. The problem becomes increasingly acute with time since more new programs are undertaken each year than are discontinued or completed, and continuing surveillance of active stockpile systems remains a requirement. The described changes to the current facilities will correct the inadequate capacity situation by appreciably increasing the number and size of cells available for tests and will significantly improve test efficiency through arrangement of the cells, control, and preparation rooms in the most usable manner. This arrangement will enable increased and more accurate data accumulation from each test shot as well as much-needed test flexibility. New technologies to be provided by the new explosive test component facility are essential to meet current and future testing requirements.

The reduction in the cost estimate of \$600,000 reflects adjustments made due to current lower than anticipated inflation rates for construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Explosive component test facility,
Mound Facility, Miamisburg, Ohio

2. Project No.: 84-D-120

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 13% of construction costs, item b		\$ 2,200
b. Construction costs		16,400
(1) Site preparation, including relocation of roads	\$ 190	
(2) Building construction, approximately 28,000 square feet at \$140 per square foot	3,780	
(3) Special facilities, including test cells and equipment	11,660	
(4) Other structures, including replacement of small metal buildings and magazines	580	
(5) Utilities	190	
c. Standard equipment		500
	Subtotal	19,100
d. Contingency at approximately 12% of above costs		2,200 <u>b/</u>
	Total estimated cost ...	\$21,300

11. Method of performance

Design and inspection of the conventional construction work will be performed under a negotiated architect-engineer contract. Design of special facilities will be accomplished by the operating contractor under an existing cost-type contract. Construction of the new building, utilities, and relocation work will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding. Procurement and installation of the special facilities will be accomplished by the operating contractor.

a/ Based upon a completed conceptual design.

b/ Applies to work to be performed in FY 1984, FY 1985, and FY 1986.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Explosive component test facility,
Mound Facility, Miamisburg, Ohio

2. Project No.: 84-D-120

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>Total</u>
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 1,600	\$ 6,500	\$ 7,500	\$ 5,700	\$ 21,300
Total facility costs	1,600	6,500	7,500	5,700	21,300
2. Other project costs					
(a) Conceptual design	50	0	0	0	50
Total other project costs	50	0	0	0	50
Total project costs					
(items 1 and 2)	\$ 1,650	\$ 6,500	\$ 7,500	\$ 5,700	\$ 21,350

b. Other related funding requirements (estimated life of project: 30 years)

1. Facility operating costs	
Total other related funding requirements	\$ 920
	\$ 920

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project costs

(a) Conceptual design costs

Approximately \$50,000 was required to prepare a conceptual design, preliminary schedule, and cost estimate for this project.

b. Other related funding requirements

It is estimated that the programmatic life of this facility will be 30 years.

1. Facility operating costs

Facility operating costs of \$920,000 are projected. This includes utilities, maintenance, janitorial services, and overhead.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance

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

1. Title and location of project: Safeguards and site security upgrade,
Rocky Flats Plant, Golden, Colorado	2. Project No.: 84-D-121
3. Date A-E work initiated: 4th Qtr. FY 1979 <u>a/</u>	5. Previous cost estimate: \$23,425
Date: 1/83
3a. Date physical construction starts: 1st Qtr. FY 1984	6. Current cost estimate: \$22,625
Less amount for PE&D: 1,425 <u>a/</u>
Net cost estimate: \$21,200
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1986	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
225	1984	\$10,000	\$10,000	\$10,000	\$ 6,000
	1985	11,200	11,200	11,200	9,200
	1986	0	0	0	6,000

8. Brief physical description of project

This project will continue the safeguards upgrading of the Rocky Flats Plant. Four major elements of work to be completed under this project include: (1) completion of the perimeter security zone (PSZ) which encloses work areas where special nuclear materials (SNM) are stored, handled, and processed; (2) completion of a new hardened guardpost with motorized gates; (3) installation of personnel loggers for monitoring people passing into and out of SNM access areas; and (4) installation of SNM measurement equipment for rapid plantwide accountability for the SNM inventory.

The area within the Rocky Flats Plant where SNM is stored, handled, and processed is enclosed by a PSZ built under Project 78-17-d, Weapons Safeguards, Various Locations. The existing PSZ is approximately 22,000 feet long. It is enclosed by two parallel 8-foot-high chainlink fences separated by 100 feet of cleared, graded space monitored by four guard towers and three guardposts. This project will provide an electronic sensor system, a closed-circuit television monitoring system,

a/ Funds for design of this project were provided under Project 79-8, Plant Engineering and Design, Various Locations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade, Rocky Flats Plant, Golden, Colorado	2. Project No.: 84-D-121
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8. Brief physical description of project (contd.)

and a vehicle barrier within the PSZ to improve surveillance and control of the SNM area. Construction will involve emplacement of electronic sensors in the ground and on the fences. The closed-circuit television system will include installation of pole-mounted video cameras. Buried power and signal cables will be installed, as necessary, to establish an alarm system to alert personnel in guard towers and the security command center.

A new guardpost, hardened with concrete walls and roof and windows glazed with bullet-resistant materials will be built to control access to the existing Nuclear Safety Facility. Electrically operated vehicle gates will be remotely controlled from within the hardened guardpost. Separate motor-operated gates will be provided to control personnel from within the guard station. Radiographic monitors will be installed to screen personnel entering the controlled area.

An electronic personnel logging system will be installed at the three points where personnel are provided access to the area where SNM is stored, handled, and processed. The personnel logging system will provide electronic identity card readers and electrically controlled turnstiles designed to verify individual area access authorization and to record identity and time and date of entry. The system will log all personnel entries and departures.

The Rocky Flats Plant SNM measurement capability will be upgraded by this project which will provide nondestructive instrumentation components and systems and improved analytical laboratory equipment. The new SNM measurement system will be installed in six buildings and will be designed specifically for performing nondestructive assays on the types of materials in process. The new equipment will furnish a near real-time analysis capability, will permit significant reductions in error limits, and will provide a capability to analyze complex mixtures of radioactive species encountered in processing residues.

The requested FY 1985 funding will continue construction.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to improve safeguards and security facilities at the Rocky Flats Plant in order to deter unauthorized entrance into areas where SNM is processed, handled, and stored and in order to improve nuclear materials accountability at the site. This project is required to meet the intent of DOE Order 5632.2, Physical Protection of Special Nuclear Materials, and recommendations of the DOE Office of Safeguards and Security. The construction planned will provide early warning of, and a deterrent to, any attempted unauthorized entrance into the SNM area inside the PSZ. This project will reduce the potential for unauthorized entrance to the SNM access areas by providing an alarm system and a vehicle barrier to augment the existing perimeter enclosure and guard force.

The existing SNM accountability equipment is barely adequate for the current workload and the limits of accuracy are less than desired. Without the new equipment, the plant's ability to evaluate, measure, and control its SNM inventory will deteriorate. DOE requirements for accountability control cannot be assured without this new equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 84-D-121

9. Purpose, justification of need for, and scope of project (contd.)

Plant engineering and design funds provided for design of safeguards and security requirements at Rocky Flats have been used primarily for design of the perimeter intrusion detection and vehicle barrier system which is about 30 percent complete. The hardened guardpost design has been completed.

The reduction in the cost estimate reflects adjustments made due to current lower than anticipated inflation rates for construction.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 3% of construction, item b		\$ 400 b/
b. Construction costs		14,200
(1) Buildings (guardpost)	\$ 180	
(2) Special facilities, including instrumentation, vehicle barriers, and personnel loggers	13,800	
(3) Utilities	220	
c. Standard equipment, including SNM measuring equipment		3,800
Subtotal		18,400
d. Contingency at approximately 15% of above costs		2,800 c/
Total estimated cost		\$21,200

11. Method of performance

Design and inspection and procurements related to the perimeter security improvements, personnel logging systems, and SNM measuring equipment will be performed by operating contractors. Design and inspection of the hardened guardpost will be performed under a negotiated architect-engineer contract. Construction will be accomplished by fixed-price contracts awarded on the basis of competitive bids. The operating contractor will furnish and install selected items of special equipment and will perform minor completion tasks.

a/ Based on essentially completed Title I and Title II design.

b/ Excludes \$1,425,000 in PE&D funding provided in FY 1979.

c/ Contingency applies to work to be accomplished in FY 1984, FY 1985, and FY 1986.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 84-D-121

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item	\$ 6,000	\$ 9,200	\$ 6,000	\$21,200
(b) PE&D funding	1,425	0	0	1,425
Total facility costs	7,425	9,200	6,000	\$22,625
2. Other project funding				
(a) Conceptual design	8	0	0	8
Total other project funding	8	0	0	8
Total project funding (items 1 and 2)	\$ 7,433	\$ 9,200	\$ 6,000	\$22,633
b. Other related funding requirements (estimated life of project: 15 years)				
1. Facility operating costs				\$ 440
Total other related funding requirements				\$ 440

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Plant engineering and design

Title I and Title II design for this project was begun using \$1,425,000 provided under Project 79-8, Plant Engineering and Design, Various Locations.

2. Conceptual Design

The cost of the conceptual design prepared for this project was \$8,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade,
Rocky Flats Plant, Golden, Colorado

2. Project No.: 84-D-121

13. Narrative explanation of total project funding and other related funding requirements (contd.)

1. Facility operating costs

Annual facility operating costs, estimated at \$440,000, will cover the cost of 10 maintenance personnel, 3 technical specialists, utilities, materials, and supplies.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands; Narrative material in whole dollars)

1. Title and location of project: Environmental improvements, Y-12 Plant,
Oak Ridge, Tennessee	2. Project No.: 84-D-124
3. Date A-E work initiated: 3rd Qtr. FY 1984	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 4th Qtr. FY 1984	6. Current cost estimate: \$56,000
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1988	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
Proposed 1984 Supplemental	\$ 7,600	\$ 7,600	\$ 7,600	\$ 2,300
1985	21,400	21,400	21,400	9,500
1986	15,000	15,000	15,000	15,200
1987	9,000	9,000	9,000	17,000
1988	3,000	3,000	3,000	12,000

8. Brief physical description of project

This project provides for construction of new facilities and for modification of existing facilities for the handling and treatment of liquid and solid wastes and for the containment and elimination of major pollution sources and hazards. Eighteen subprojects to be completed by this project are categorized in four primary classes of environmental control activities: (1) liquid waste disposal; (2) solid waste disposal; (3) demolition and decontamination of mercury-contaminated facilities; and (4) general environmental control measures.

Facilities for liquid waste disposal improvements will be provided by six subprojects:

1. A steam plant waste water treatment facility will provide for treatment of acid and caustic discharges from the Y-12 coal yard and steam plant. It will include concrete-lined collection ditches for directing coal yard runoff, a collection basin for flow equalization and settling coal fines, a chemical system for neutralizing the waste water and for precipitating trace metals, a clarifying system, a sludge dewatering system, and an 80 square-foot shed for instrumentation and controls.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-124

8. Brief physical description of project (contd.)

2. Plating waste treatment will be accomplished by installation of a packaged treatment facility for processing about 9 million gallons per year of plating rinse water. Collection tanks, pumps, and a 200 square-foot building will be provided.
3. National pollutant discharge elimination system requirements of the Environmental Protection Agency (EPA) will be supported by construction of approximately ten monitoring stations which will contain flow measurement equipment, continuous pH and temperature monitors, and flow proportional samplers.
4. At the east end of the plant, a package treatment plant will be installed to treat paint-contaminated water from two painting shops, and oil and detergent-contaminated water from a process building.
5. A source collection and treatment facility to be built will include collection tanks with curbs, piping, and truck loading stations.
6. At the west end of the plant, facilities will be provided for neutralizing acid and caustic wastes. Standard neutralization equipment will provide initial treatment plus a rapid sand filter, an aeration basin, and a disinfection unit. Instrumentation will be provided to measure flow, pH, nitrate, and biological oxygen demand.

Solid waste disposal improvements will be provided in five subprojects:

1. Radioactive waste disposal facilities consisting of above ground concrete vaults will be provided for interim storage of waste uranium oxide.
2. Remedial construction at existing solid waste disposal facilities will be provided to reduce migration of buried wastes which are currently contributing pollution to surface and subsurface waters. This will involve trenching, grouting, and other actions to minimize migration.
3. A trash and scrap monitoring facility will be constructed for monitoring uranium, thorium, and other radioactively contaminated material. The facility will include detection and recording equipment and an enclosure for mounting the detectors. Provisions will be made to monitor waste materials before leaving the Y-12 Plant site to prevent radioactively contaminated wastes from reaching unauthorized disposal sites.
4. Initial site development and temporary fencing will be provided for a central waste disposal facility. The initial site development will consist of improving access roads, clearing the site, and providing parking and turnaround space for vehicles. Area lighting, limited fencing, and one trailer for operating equipment will be provided. An initial disposal trench will be excavated and site drainage provided.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-124

8. Brief physical description of project (contd.)

5. Uranium chip oxidizers will be provided to convert waste chips of depleted uranium to a stable oxide powder for long-term storage. Chip handling equipment, oxide removal equipment, a filter, a blower, and an exhaust stack will be provided.

Demolition and decommissioning of mercury-contaminated facilities will consist of two subprojects:

1. An existing building contains long-discontinued process facility contaminated with residual mercury. Mercury-contaminated equipment will be removed from the building and the building will be cleaned to significantly reduce mercury sources. Cleanup is expected to involve partial demolition of the building to eliminate mercury that may be found in the floors and surrounding soils.
2. Relocation of production and support activities from the above building will require construction of two small buildings of about 41,000 square feet. The electrochemical metal removal facility equipment and approximately 50 operating personnel will be relocated to one building. Approximately 100 engineering personnel, currently located in the contaminated building, will be relocated to the second building.

Facilities needed immediately for general environmental control measures are included in the following five subprojects:

1. Waste oil and solvent handling will require new separation and storage facilities to eliminate beryllium compounds and preclude contamination of other waste oils. This project will provide additional contaminated oil storage facilities and equipment for removal of beryllium compounds from waste oil.
2. Spill prevention measures are required to protect existing plant chemical and waste transfer stations. This construction will consist primarily of dikes, curbing, and sump pumps.
3. An existing analytical laboratory will be refurbished and expanded to handle a tenfold increase in workload recently imposed by environmental concerns and agreements for corrective actions with the State of Tennessee and the EPA. This subproject will refurbish existing laboratory spaces and establish approximately 5,000 square feet of additional space in an existing building to support environmental laboratory activities. The additional laboratory capacity will be dedicated to contamination control, sample preparation, change house facility monitoring, receiving and shipping, and salvage operations.
4. A contaminated liquid and solid waste storage facility will be provided to handle contaminated materials that are controlled as hazardous and radioactive mixed waste. The facility to be provided will be a specially designed building of approximately 8,000 square feet to serve as interim storage for special wastes awaiting final disposal action. Provision will be made for packaging and handling special wastes.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-124

8. Brief physical description of project (contd.)

5. This subproject will provide for replacement of PCB-filled electric transformers in service at the Y-12 Plant. Most of these transformers are nearing the end of their useful lives; therefore, replacement is more cost-effective than construction of containment structures.

The FY 1984 funding requested will be used for design of new facilities and modification of existing facilities and will initiate construction on small subprojects. The FY 1985 funding requested will start construction of major subprojects.

9. Purpose, justification of need for, and scope of project

The Y-12 Plant has been cited recently for noncompliance in several environmental areas by both the State of Tennessee Department of Health and Environment (TDHE) and the EPA.

Past and present disposal practices for solid and liquid wastes are no longer acceptable. Dilute liquid wastes may no longer be discharged directly or indirectly to either the East Fork Poplar Creek which originates within the plant and runs through the City of Oak Ridge, or to the Bear Creek drainage basin. Furthermore, solid waste may no longer be buried in the Bear Creek disposal areas which are now contributing contamination to the groundwater.

Certain past operations have left an environmental legacy. Lithium isotope separation processes operated in the late 1950's and early 1960's resulted in extensive losses of mercury within the Y-12 Plant. Residual mercury is contained in old process buildings and grounds. Mercury from this source continues to be released to the East Fork Poplar Creek in continuous violation of the Tennessee Stream Guide for mercury. In order to attempt to meet the State guides, sources of contamination such as old process buildings, equipment, and soils containing mercury residue will have to be decontaminated or isolated.

Subsequent to the notification of noncompliance in these areas, certain environmental objectives were agreed upon by the TDHE, EPA, and the U.S. Department of Energy (DOE) in a Memorandum of Understanding (MOU), signed May 26, 1983. The MOU delineates the actions which constitute preliminary measures toward full environmental compliance, and it has been strongly stated both in the MOU and subsequent meetings between the TDHE, EPA, and DOE that further plans, actions, and remedial programs will be developed. To this end, this project will provide improvements which are necessary to support the current MOU and those that will be required in the near term to meet further compliance agreements between the parties.

Liquid waste disposal facilities

The current practice of discharging dilute untreated effluents such as acids, caustics, and plating wastes to local streams is in violation of requirements of the Federal Water Pollution Control Act. Liquid waste will be intercepted at the sources and treated by the proposed facilities. These facilities include waste collection tanks, dikes, piping, and package treatment units and monitors for treated effluents to assure compliance with discharge permits.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-124

9. Purpose, justification of need for, and scope of project (contd.)

Solid Waste Disposal Facility

Facilities must be provided at existing burial grounds to effect remedial action by containment or stabilizing chemical and radionuclide contaminants so that sources of pollution are eliminated and the quality of the groundwater in Bear Creek Valley is no longer adversely impacted. New facilities must be provided for monitoring, storing, processing, and disposing of radioactive solid waste to meet the requirements of DOE Order 5480.2, "Hazardous and Radioactive Mixed Waste Management"; and DOE Order 5820, "Radioactive Waste Management"; the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, and State regulations governing solid waste disposal. The new burial ground development that must be provided by this project consists of initial site work, access improvements, clearing, limited fencing, the installation of the first disposal trench, and limited operating facilities. Request for funding of the full site development of a central waste disposal facility for the Oak Ridge plants and laboratory is being planned for a future fiscal year.

Dismantling and decontaminating facilities

Residues of mercury in several process buildings are presently leaking and contributing to contamination of waters which discharge to the East Fork Poplar Creek. Included in this project is relocation of production and production support facilities currently located in a mercury-contaminated facility in order to assure the safety of production workers during removal of mercury and asbestos bearing process equipment. Environmental control systems, such as building ventilation, must be upgraded to provide the required degree of protection to employees involved in clean-up activities. Facilities must be provided to prepare dismantled equipment for acceptable disposal.

General environmental control measures

Other environmental hazards that require elimination include: replacement of power transformers containing PCB in vulnerable locations, separation of contaminated waste oil and solvent and processing for commercial sale or other acceptable disposal, additional diking of several storage facilities within the plant to control chemical spills, and provisions for the handling and storage of Resource Conservation and Recovery Act waste and Resource Conservation and Recovery Act waste contaminated with uranium.

Another provision is for expanding the Y-12 Plant laboratory. Expansion is required to handle a significantly increased workload for environmental sampling and to provide a lower radioactive background for environmental sample analyses.

Alternatives to the current concepts for this project will be assessed for more effective technology or economics.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-124

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 20 percent of construction costs, item b ..		\$ 7,500
b. Construction costs		36,300
(1) Improvements to land, including roads, grading, excavation, and fencing	\$ 800	
(2) Buildings		
(a) Process buildings, approx. 25,000 square feet at approx. \$150/square foot	3,750	
(b) Process support buildings, approx. 29,000 square feet at \$150/square foot	4,350	
(3) Special facilities including waste treatment facilities, monitoring, and sampling stations, tank farms, spill control facilities, and laboratory remodeling	25,400	
(4) Utilities, including electrical power, water, steam, and sanitary sewer	2,000	
c. Standard equipment		1,000
Subtotal		\$44,800
d. Contingency at approximately 25 percent of above costs		11,200
Total project cost		\$56,000

11. Method of performance

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

a/ These estimates are the product of a preliminary engineering assessment. A conceptual design report costing approximately \$800,000 will be completed in January 1984.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Environmental improvements, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-124

12. Funding schedule of project funding and other related funding requirements

	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>Total</u>
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$ 2,300	\$9,500	\$15,200	\$17,000	\$12,000	\$56,000
Total facility cost	\$ 2,300	\$9,500	\$15,200	\$17,000	\$12,000	\$56,000
2. Other project funding						
(a) Conceptual design	\$ 800	\$ 0	\$ 0	\$ 0	\$ 0	\$ 800
Total other project funding	\$ 800	\$ 0	\$ 0	\$ 0	\$ 0	\$ 800
Total project funding (Items 1 and 2)	\$ 3,100	\$9,500	\$15,200	\$17,000	\$12,000	\$56,800
b. Other related funding requirements (estimated life of project: 15 years)						
1. Facility operating costs						\$1,000
2. Programmatic operating expenses directly related to the facility						3,500
Total other related annual funding requirements						\$4,500

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding

(a) The cost of preparing a conceptual design for this project is \$800,000.

b. Total related funding requirements

1. Facility operating costs

The facility operating costs estimated for this project include utilities, labor, material, and supplies for maintenance and janitorial services.

2. Programmatic operating expenses directly related to the facility

The programmatic operating expenses associated with operating the facilities provided by this project include direct labor, fringe benefits, and overhead costs plus the cost of supplies and materials required in the operation.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance

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

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant,
Oak Ridge, Tennessee	2. Project No.: 84-D-211
3. Date A-E work initiated: 3rd Qtr. FY 1984	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 4th Qtr. FY 1984	6. Current cost estimate: \$63,000
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1987	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
C)	Proposed 1984 Supplemental	\$ 7,500	\$ 7,500	\$ 7,500	\$ 2,500
C)	1985	8,000	8,000	8,000	7,000
	1986	34,000	34,000	34,000	30,000
	1987	13,500	13,500	13,500	23,500

8. Brief physical description of project

This project provides for the installation of new facilities and systems, and modifications to existing facilities and systems, to upgrade the safeguards posture of the Y-12 Plant. The project, as currently defined, includes the following items:

a. Closure and control of Bear Creek Road

Includes barriers with hardened guard portals on the east and west end of Bear Creek Road, identification check booths on Bear Creek Road, and unmanned vehicle barriers on secondary roads.

b. Guard Towers

Includes two hardened, elevated guard towers with two-level firing ports, emergency power, external lighting, and necessary utilities service. One tower would be located on the north side of the plant and one on the south side of the plant.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant, Oak Ridge, Tennessee	2. Project No.: 84-D-211
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8. Brief physical description of project (contd.)

c. Relocation of construction contractor

Covers construction of approximately 37,600 square feet of new floor space to provide for relocation of the onsite construction contractor from the present location to a location west of the plant.

d. Perimeter intrusion detection/assessment system

Involves the construction of approximately 14,000 feet of new double fencing around the plant protected area, installation of three levels of alarm sensors with closed circuit television (CCTV) assessment capability, and upgrading of lighting. It also provides for relocation of utilities as required to facilitate construction and replacement of parking space and storage vault space lost due to construction.

e. Harden personnel monitor stations

Includes replacement of eight existing personnel monitoring stations. The stations will provide improved special nuclear material (SNM) detection systems, incoming weapons detection capabilities, incoming and outgoing pathways, and pass-through radiation detectors.

f. Upgrade central alarm system

Covers the procurement and installation of equipment to upgrade the central alarm system to provide a backup alarm system.

g. Interior alarm and assessment systems

Includes the installation of additional intrusion alarms and CCTV assessment systems to provide complete coverage of all operating and storage space in material access areas.

h. Harden protected area portals

This item covers additional hardening of pedestrian and vehicular protected area portals including armor, gun ports, exit and entrance barriers, duress devices, and upgraded lighting.

i. Guard facility

Includes the construction of a facility consisting of approximately 18,000 square feet to house the Y-12 security inspector force and related operations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-211

8. Brief physical description of project (contd.)

The requested FY 1984 funding will be used to initiate work on items a., b., and c. The requested FY 1985 funding will be used to initiate design on the balance of the project and procurement of long-lead equipment.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide for upgrading of physical protection at the Y-12 Plant as required to meet current U.S. Department of Energy (DOE) threat guidance.

Justification for each item included in the project is presented below.

a. Closure and control of Bear Creek Road

This is an "Official Use Only" road which parallels the north perimeter fence of the plant and runs near a major weapons production building housing a significant quantity of highly enriched uranium. The primary purposes of closure and control of this road are to provide the capability for containing or delaying adversaries attempting to leave the facilities in a land vehicle and to prevent easy access by adversaries to areas which are in close proximity to major production facilities.

b. Guard towers

The towers will enhance the capability for early detection, assessment, and warning of approaching adversaries. The towers provide cover and a firing platform overlooking a major path of escape. A security inspector positioned in the tower can contain adversaries until a response team arrives. During an excavation of a nearby material access area, the security personnel within the tower can observe and initiate containment of exiting personnel.

c. Relocation of construction contractor

The present location of this contractor is operated as an "island" in the plant protected area and is accessible to uncleared workers, vendors, and other visitors.

d. Perimeter intrusion detection/assessment system

This system is necessary for effective detection of intruders attempting to gain access into the protected area. With effective detection and assessment at the protected area perimeter, actions can be taken to delay adversaries long enough to allow response forces adequate time to prevent adversaries from gaining access to target material. CCTV assessment capability is required to determine the appropriate response to a particular alarm.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-211

9. Purpose, justification of need for, and scope of project (contd.)

e. Harden personnel monitor stations

The need for hardening of personnel monitor stations is to provide protection for the security inspector and to prevent an adversary from using the station as a rapid entry or exit pathway. Also, this upgrade will significantly improve protection against long-term diversion of SNM.

f. Upgrade central alarm station

This item is required to correct a number of current and potential problems with the existing system and its operation and to provide backup capability.

g. Interior alarm and assessment systems

C) This item is required to ensure an alarm whenever unauthorized access to areas containing SNM occurs. Detection of
F) penetrations by adversaries both on-shift and off-shift is necessary in order to facilitate rapid responses. CCTV coverage
R) is required for immediate assessment of alarms and to provide assistance in directing response forces.

h. Harden protected area portals

This item provides attending security inspectors with hardened protected area portals.

i. Guard facility

This facility is required to accommodate increases in the Y-12 security inspector force. The existing facility is inadequate for the current force, and this problem will become more critical with projected increases in the force.

Under the constraints of DOE security orders, currently there are no acceptable alternatives to this project as an entity or as a whole. Failure to provide the equivalent of this project will impose unwanted security risks.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-211

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 24% of construction costs, item b		\$ 9,400
b. Construction costs		38,500
(2) Buildings		
(a) New and modified space to include items such as vaults, guard facilities, personnel monitoring station, and other related changes, approximately 21,000 square feet at \$142/square foot	\$ 2,980	
(b) DOE and construction contractor space, approximately 37,500 square feet at \$67/square foot	2,500	
(4) Special facilities	32,020	
(5) Utilities, including electrical power, water, steam, and sanitary sewer lines	1,000	
c. Standard equipment		1,000
	Subtotal	\$48,900
d. Contingency at approximately 29% of the above costs		14,100
	Total estimated cost	\$63,000

11. Method of performance

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

a/ Estimates based upon a completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-211

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1984	FY 1985	FY 1986	FY 1987	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$ 0	\$2,500	\$ 7,000	\$30,000	\$23,500	\$63,000
Total facility cost	\$ 0	\$2,500	\$ 7,000	\$30,000	\$23,500	\$63,000
2. Other project funding						
(a) Conceptual design	\$ 150	\$ 0	\$ 0	\$ 0	\$ 0	\$ 150
Total other project cost	\$ 150	\$ 0	\$ 0	\$ 0	\$ 0	\$ 150
Total project costs (Items 1 and 2)	\$ 150	\$2,500	\$ 7,000	\$30,000	\$23,500	\$63,150
b. Other related funding requirements (estimated life of project: 15 years)						
1. Facility operating costs						\$1,408
2. Programmatic operating expenses directly related to the facility						5,634
3. Capital equipment not related to construction but related to the programmatic effort in the facility						0
4. GPP or other construction related to programmatic effort in the facility						0
5. Other costs						0
Total other related annual funding requirements						\$7,042

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project cost

(a) Conceptual design costs

Approximately \$150,000 was required to prepare a conceptual design, preliminary schedule, and cost estimate for this project.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrading, Y-12 Plant,
Oak Ridge, Tennessee

2. Project No.: 84-D-211

13. Narrative explanation of total project funding and related funding requirements (contd.)

b. Other related funding requirements

1. Facility operating costs

Facility operating costs of \$1,408,000 are projected to cover the cost of maintenance, utilities, and overhead for the project.

2. Programmatic operating costs

Programmatic operating costs estimated at \$5,634,000 annually will cover the necessary manpower, materials, and overhead to support this project.

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Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Safeguards and site security upgrade,
Pinellas Plant, Florida	2. Project No.: 84-D-212
3. Date A-E work initiated: 3rd Qtr. FY 1984	5. Previous cost estimate: None
Date:
3a. Date physical construction starts: 2nd Qtr. FY 1985	6. Current cost estimate: \$ 3,700
Date: 1/84
4. Date construction ends: 3rd Qtr. FY 1986	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
C) F. J.	Proposed 1984 Supplemental	\$1,000	\$1,000	\$1,000	\$ 200
	1985	2,700	2,700	2,700	1,300
	1986	0	0	0	2,200

8. Brief physical description of project

This project provides for the construction of a new security communications center which is necessary to enhance the safeguards and security at the Pinellas Plant. This project also includes procurement and installation of equipment to make the center operational.

The new facility will be one-story, 100 feet by 200 feet, with a gross area of 20,000 square feet. The facility will be a combination of hardened and unhardened construction. Utilities will be connected to existing plant systems.

The facility will provide space to support the security operations which have expanded in size and scope of responsibilities. This space will provide for the following needs:

- a. "Ready Room" to accommodate the larger shift staffing.
- b. Change rooms for the increasing staff and provide separate rooms for men and women.
- c. Training rooms to conduct classwork on an around-the-clock basis. This is attributed to the increased variety and depth of training coupled with the increased number of security inspectors.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade,
Pinellas Plant, Florida

2. Project No.: 84-D-212

8. Brief physical description of project (contd.)

- d. Additional office space to accommodate the additions to the security professional and supervisory staffs.
- e. Indoor firing range will permit day and night firing and will not restrict practice due to inclement weather. The range will also eliminate community concerns arising from the noise of gunfire and potential stray or ricocheting bullets.
- f. Communication center is required to act as the radio and telephone control element and the monitor facility for the alarms and closed circuit television (CCTV) systems.
- g. An armory is planned to store the firearms of off-duty inspectors, as well as ammunition, extra firearms, backup and auxiliary weapons. It is necessary to harden this facility to the point that such equipment cannot easily be seized by an intruder.

The FY 1984 funding will be used to initiate design, land improvements, and utilities. The FY 1985 funding will be used to complete the project.

9. Purpose, justification of need for, and scope of project

The construction of a new security communications center is necessary to accomplish the plant's two main objectives of safeguards and security operations at the Pinellas Plant. The objectives are:

- a. To assure continuity of plant operations to the degree that weapons build schedules are not put in jeopardy.
- b. To prevent unauthorized individuals (cleared and uncleared) from obtaining special nuclear material (SNM) and/or classified information and materials.

To meet both objectives, it is necessary to control individual movement into, within, and out of the plant site. The requirement for the new security communications center is based upon the planned growth in the security force, the need to properly house the increased security force, provide proper training facilities for the security force, and the need to replace outmoded security center equipment with state-of-the-art equipment. The need exists for: (1) a properly trained and equipped security force adequate to carry on the day-to-day control of movement of people, vehicles, equipment, material, and classified information, and (2) a response capability that will detect, delay, and contain.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade,
Pinellas Plant, Florida

2. Project No.: 84-D-212

10. Details of cost estimate a/

Item cost Total cost

a. Engineering, design, and inspection at approximately 13% of construction costs, item b		\$ 300
b. Construction costs		2,400
(1) Improvements to land	\$ 80	
(2) Buildings	2,200	
(3) Utilities	\$ 120	
c. Standard equipment		400
Subtotal		3,100
d. Contingency at approximately 19% of above costs		600
Total project cost		\$3,700

11. Method of performance

Design and engineering will be performed under an operating contractor subcontract, fixed-price negotiated. Construction will be accomplished by fixed-price contract awarded on the basis of competitive bids and administered by the operating contractor. Standard equipment will be procured and installed by the operating contractor.

12. Funding schedule of project funding and other related funding requirements

	FY 1984	FY 1985	FY 1986	FY 1987	Total
a. Total project costs					
1. Total facility costs					
(a) Construction line item	\$ 200	\$ 1,300	\$ 1,400	\$ 800	\$ 3,700
Total facility cost	\$ 200	\$ 1,300	\$ 1,400	\$ 800	\$ 3,700
2. Other project funding					
(a) Conceptual design	\$ 180	\$ 0	\$ 0	\$ 0	\$ 180
Total other project funding	\$ 180	\$ 0	\$ 0	\$ 0	\$ 180
Total project funding (Items 1 and 2)	\$ 380	\$ 1,300	\$ 1,400	\$ 800	\$ 3,880

a/ Based upon a preliminary conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and site security upgrade,
Pinellas Plant, Florida

2. Project No.: 84-D-212

12. Funding schedule of project funding and other related funding requirements (contd.)

b. Other related funding requirements

1. Facility operating costs	\$1,000
2. Programmatic operating expenses directly related to the facility	2,500
3. Capital equipment not related to construction but related to programmatic effort in the facilities	0
4. GPP or other construction related to programmatic effort in the facility.....	0
5. Other costs	0
Total other related annual costs requirements	\$3,500

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Other project funding

(a) Conceptual design

Approximately \$180,000 is required to prepare the conceptual design.

b. Other related funding requirements

1. Facility operating costs

Facility operating costs of \$1,000,000 are projected to cover the cost of maintenance and utilities for the project.

2. Programmatic operating costs

Programmatic operating costs estimated to support the project are \$2,500,000.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Standard missile-2 (SM-2) warhead production facilities, various locations	2. Project No.: 83-D-124
3. Date A-E work initiated: 1st Qtr. FY 1983	5. Previous cost estimate: \$10,000 Date: 1/83
3a. Date physical construction starts: 3rd Qtr. FY 1983	6. Current cost estimate: \$11,000 Date: 1/84
4. Date construction ends: 4th Qtr. FY 1987	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1983	\$ 2,000	\$2,000	\$1,949	\$ 251
1984	0	0	51	1,749
1985	9,000	9,000	9,000	2,700
1986	0	0	0	3,600
1987	0	0	0	2,700

8. Brief physical description of project

This project will provide building modifications and additional equipment required to produce the SM-2 warhead (W81). Design alternatives, production techniques, and plant workloads influence capital requirements. Current planning indicates that numerous modifications of existing facilities and additional equipment will be required. Following are examples of equipment and facility modifications currently planned for this project. At the Bendix Plant, Kansas City, Missouri, temperature chambers will be provided for testing hard-link switches. Standards and calibration equipment will be provided for producing and testing the fireset and programmer. At the Pinellas Plant, St. Petersburg, Florida, curing ovens will be provided for capacitor production. A hydrogen furnace, a scanning electron microscope, and miscellaneous minor equipment will be provided for neutron generator production. At the Pantex Plant, Amarillo, Texas, process and inspection equipment will be provided for use in fabricating high explosives and for final weapons assembly operations. An accelerated aging unit and test system will be built for use on assembled weapons. Requirements for the Mound Facility, Miamisburg, Ohio, include installation of an infrared laser and focusing system, laser welder, and positioner. Volume measuring equipment and an environmental test chamber will be built for use in production of detonators and cable assemblies. The Rocky Flats Plant, Golden, Colorado, will be provided with a numerically controlled ultrasonic scanner, endoscope, and additional equipment for use with new reservoirs.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Standard missile-2 (SM-2) warhead production facilities, various locations

2. Project No.: 83-D-124

8. Brief physical description of project (contd.)

Additional equipment will be provided for production of the weapon pit. The Y-12 Plant, Oak Ridge, Tennessee, requires two additional computer numerically controlled turning machines and a multihead electrical discharge machine. A large caster for uranium alloy components will be modified.

Weapon design decisions which affect production facility requirements have been made. During the ongoing full-scale development process, allowances included in the initial cost estimate for facility design uncertainties have been apportioned to cover the necessary construction and equipment procurement.

The requested FY 1985 funding will complete the project.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide new capabilities and additional production capacity needed to meet the established production requirements for the SM-2 warhead.

Maximum use will be made of existing manufacturing facilities; however, unique features of the warhead will require capabilities not currently available in the production plants. The additional number of parts added to the current production workload will require additional production capacity.

The SM-2 is a Navy missile with fleet defense as its primary role. Design work is currently in process for upgraded versions of the existing missiles. The W81 warhead will provide nuclear capability for the SM-2. Agreement was reached in September 1977 with the Department of Defense (DOD) to proceed with Phase 3 development engineering activities.

10. Details of cost estimate a/

	Total cost
a. Engineering, design, and inspection at approximately 15% of construction costs, item b	\$ 200
b. Construction costs	1,200
c. Standard equipment	8,300
Subtotal	9,700
d. Contingency at approximately 13% of above costs	1,300
Total estimated cost	\$11,000

a/ Based upon completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Standard missile-2 (SM-2) warhead production facilities, various locations

2. Project No.: 83-D-124

10. Details of cost estimate (contd.) Total cost

Estimates by location are as follows:

Bendix Plant, Kansas City, Missouri	\$ 2,500
Pinellas Plant, St. Petersburg, Florida	500
Pantex Plant, Amarillo, Texas	770
Mound Facility, Miamisburg, Ohio	1,400
Rocky Flats Plant, Golden, Colorado	2,400
Y-12 Plant, Oak Ridge, Tennessee	3,430
Total	\$11,000

11. Method of performance

Design and inspection will be performed primarily by the operating contractors and, where feasible, under negotiated architect-engineer contracts. Equipment procurement, inspection, and installation will be performed by operating contractors.

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>Total</u>
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 2,000	\$ 2,700	\$ 3,600	\$2,700	\$11,000
Total facility costs	\$ 2,000	\$ 2,700	\$ 3,600	2,700	\$11,000
2. Other project funding					
(a) Conceptual design	36	0	0	0	36
Total other project funding	36	0	0	0	36
Total project funding (items 1 and 2)	\$ 2,036	\$ 2,700	\$ 3,600	\$2,700	\$11,036

b. Other related funding requirements (estimated life of project: 10 years)

1. Facility operating costs	\$ 50
2. Programmatic operating expenses directly related to the facilities	360
Total other related annual funding requirements	\$ 410

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Standard missile-2 (SM-2) warhead production facilities, various locations	2. Project No.: 83-D-124
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13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
 - 1. Other project funding
 - (a) Conceptual design

Conceptual design costs of about \$36,000 have been incurred in the process of developing and improving the project cost estimate and schedule.

- b. Other related funding requirements

It is estimated that the programmatic life of these facilities will be at least 10 years.

- 1. Facility operating costs include utilities, maintenance, and janitorial services.
- 2. Programmatic operating expenses include direct labor, materials and supplies, procurement and fabrication of tooling, and overhead.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Utilities and equipment restoration, replacement, and upgrade, Phase 3, various locations	2. Project No.: 82-D-107
3. Date A-E work initiated: 1st Qtr. FY 1982	5. Previous cost estimate: \$1,036,000 Less prior projects: 211,000 Net cost estimate: 825,000 Date: 1/83
3a. Date physical construction starts: 2nd Qtr. FY 1982	6. Current cost estimate: \$1,178,000 Less prior projects: 211,000 Net cost estimate: 967,000 <u>a/</u> Date: 1/84
4. Date construction ends: 4th Qtr. FY 1989	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1982	\$ 87,500	\$ 66,000	\$ 65,899	\$ 18,487
1983	132,900 <u>b/</u>	154,400 <u>b/</u>	154,405 <u>b/</u>	71,584
1984	185,000	185,000	185,096	139,579
1985	175,100	175,100	175,100	126,748
1986	175,000	175,000	175,000	224,002
1987	175,000	175,000	175,000	175,100
1988	36,500	36,500	36,500	140,750
1989	0	0	0	70,750

a/ The total project cost is estimated at \$1,178,000,000 in FY 1985 dollars. Other restoration projects have been initiated which collectively have an estimated cost of \$211,000,000 (FY 1980 Research, Development, and Testing (RD&T) capital equipment and Project numbers 79-7-n, 80-AE-6, 81-D-107, and 81-D-116). Therefore, the total estimated cost of this line item project is \$967,000,000 in FY 1985 dollars. The total estimated cost assumes that adequate capital equipment and general plant projects funding will be received in FY 1985 and future years to prevent the further deterioration of equipment and utilities in the nuclear weapons complex.

b/ Based on Continuing Resolution, Public Law 97-377.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Utilities and equipment restoration, replacement, and upgrade, Phase 3, various locations	2. Project No.: 82-D-107

8. Brief physical description of project

This project is a continuation of a multiyear program for restoration of utilities and capital equipment at the seven weapon production plants, the three weapons laboratories, and the Nevada Test Site. The project will provide for replacement of utilities and equipment that, in progressing at their normal life cycle, have deteriorated to the point that their physical condition is poor or is no longer technologically satisfactory. Appraisals of the physical condition and technological adequacy of utilities and equipment in use in the nuclear weapons production, research, development, and testing complex have been completed, and the complex has identified poor and inadequate items that should be replaced in order to meet current and future weapons program requirements. These utilities and equipment require correction due to (a) consistent substandard performance, (b) excessive maintenance costs, (c) continually threatening scheduled operations by breakdown, and (d) not being fully capable of meeting program requirements or performing at required confidence levels. These restoration efforts will be accomplished at the Y-12 Plant, Rocky Flats Plant, Bendix Plant, Mound Facility, Pantex Plant, Savannah River Plant, Pinellas Plant, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratories, and the Nevada Test Site.

The FY 1985 funding requested is \$175,100,000: \$102,000,000 will be used to continue design, procurement, and construction of utilities and equipment at the weapons production complex; \$52,900,000 will be used to continue design, procurement, and construction of the critical utilities and equipment at the three weapons laboratories; and the remaining \$20,200,000 will be used for restoration efforts at the Nevada Test Site.

9. Purpose, justification of need for, and scope of project

The Department of Energy (DOE) is responsible for the production and lifetime surveillance of safe and reliable nuclear weapons in support of United States national security. Thus, it is the mission of weapons production to provide for: (1) manufacturing capabilities and capacities required for the production of nuclear warheads, projectiles, and bombs approved by the President and planned for future enhancement of United States nuclear forces; (2) the surveillance and certification of the technical quality of nuclear weapons in the existing stockpile; (3) the provisioning of limited-life components; and (4) reviewing jointly with the Department of Defense (DOD) the safety of operating and handling procedures. During the 1980's, the annual workload for this mission is greater than the workload experienced in the late 1970's.

The primary missions of the DOE's nuclear weapons RD&T activities are: (1) to sustain international leadership in new ideas and technologies essential to maintain modern nuclear forces capable of responding to threats against the United States national security; and (2) to design, develop, and certify nuclear weapons approved by the President for DOD delivery systems.

During calendar years 1977 and 1978, members and staff of the Senate Armed Services Committee (SASC) and the House Armed Services Committee (HASC) made extensive visits to nuclear weapons production, research, development, and testing facilities. They recognized that a deficiency in production facilities and the research and development laboratories had built up over the years. It was observed further that, while this problem was acknowledged, there was no comprehensive program designed to

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Utilities and equipment restoration, replacement, and upgrade, Phase 3, various locations 2. Project No.: 82-D-107

9. Purpose, justification of need for, and scope of project (contd.)

systematically alleviate the problem. Chairman Price of the HASC, in a letter to Dr. Schlesinger on January 6, 1978, requested further information on existing studies, budget history, estimated total cost to replace obsolete equipment and utilities, a reasonable estimate for replacement costs, and DOE plans to restore such deficiencies. A SASC staff member's report to Chairman Stennis on his inspection of DOE weapon facilities was instrumental in the FY 1979 authorizing legislation requirement that the Secretary of Energy conduct a study of the status of all Government-owned, contractor-operated plant, capital equipment, facilities, and utilities which support the United States nuclear weapons program; and to submit the result of such study to the Congress at the same time the DOE authorization request for FY 1980 was submitted to the Congress.

Recognizing that a problem existed, a study was initiated in early CY 1977 to determine the extent of deterioration of equipment and utilities at the nuclear weapons production plants prior to the increased workload expected in the 1980-87 time period. The results were issued in a report dated November 1, 1977, entitled "An Appraisal of Physical Condition and Technology Status of Equipment and Utilities Systems in the Weapons Production Complex." This appraisal formed the basis for determining an estimate of \$300,000,000 to be the net accumulated degradation in FY 1980 in the production and surveillance complex.

In December 1977, a similar appraisal was initiated to determine the status of equipment and utilities at the nuclear weapons laboratories and the Nevada Test Site. The research, development, and testing study concluded that the cost of equipment and utilities which need replacement to assure an efficient and capable complex to perform nuclear weapons research, development, and testing amounted to approximately \$295,000,000 in FY 1980 dollars. Thus, the total estimate of upgrading the whole weapons complex was stated as \$595,000,000 in FY 1980 dollars. Subsequent to these appraisals, the DOE Controller was tasked to conduct an independent assessment of the appraisals. This assessment primarily concluded that: (1) degradation in the weapons complex was serious, (2) the appraisal method was technically sound, (3) some of the samples contained excess equipment that should have been purged prior to determining the estimated cost of replacement, and (4) the replacement cost was used when less costly alternatives existed for upgrading the capability. The Controller's estimate, based on these findings, was \$451,000,000.

On January 25, 1979, the Assistant Secretary for Defense Programs provided a report to the Congress on the results of the studies. As part of this study, the DOE proposed to undertake the correction of these deficiencies with a multifaceted program over the next several years. This included: (a) annual appraisals of the technical and physical status of the United States nuclear weapons capability and the progress being made to correct the existing deficiencies, (b) improving the precision of the appraisal techniques, and (c) developing annual funding requirements through the normal budgetary procedures as part of a multiyear restoration program.

The second appraisal of the nuclear weapons complex indicated that the condition of the complex continued to deteriorate and that the accumulated degradation had grown to \$790,000,000 in FY 1981 dollars. This increase over the previous estimate was caused primarily by four factors: (1) engineering-type estimates for repair or replacement costs were used rather than estimates based on Bureau of Labor Statistics escalation indices; (2) inclusion of the appraisal of interior building services at all sites; (3) an additional year's degradation from the previous appraisal; and (4) an additional year's escalation on the restoration costs for those items found to be physically poor or technologically inadequate. As was done for the first

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Utilities and equipment restoration, replacement, and upgrade, Phase 3, various locations 2. Project No.: 82-D-107

9. Purpose, justification of need for, and scope of project (contd.)

appraisal, the Controller conducted an independent assessment of the appraisals. The Controller's assessment once again verified the seriousness of the degradation in the weapons complex and that the relative growth in the estimate was justified. However, the Controller's estimate for the accumulated degradation was \$674,000,000 in FY 1981 dollars.

Three appraisals have now been completed and indicate the problem has grown to \$969,000,000 in FY 1982 dollars. Although the Controller's office has not conducted a third independent assessment, a comparable estimate of \$847,000,000 was developed utilizing the results of the Controller's second assessment; estimating the amount of additional deterioration, including the higher escalation rates being experienced; and expressing this estimate in FY 1982 dollars. Allowing for the additional deterioration continuing to be experienced due to the continued underfunding of capital equipment and general plant projects and expressing the Controller's estimate in FY 1985 dollars yields a current estimate of \$1,178,000,000. The DOE now proposes an 8-year program for the correction of the identified production and testing complex deficiencies, and a 9-year funding program for the research and development complex. The funding requested for this project is a part of that program.

10. Details of cost estimate a/

	Total cost
a. Engineering, design, and inspection	}
b. Construction costs	
(1) Building modifications	
(2) Special facilities	
(3) Utilities	}
c. Standard equipment	
d. Removal cost less salvage	}
e. Contingency	
Total estimated cost	\$967,000 b/

11. Method of performance

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

a/ Based on completed third appraisal and Controller's second assessment.

b/ Excludes prior-year projects estimated at \$211,000,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Utilities and equipment restoration, replacement, and upgrade, Phase 3, various locations

2. Project No.: 82-D-107

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	Total
a. Total project funding							
1. Total facility costs							
(a) Construction line item	\$229,650	\$126,748	\$224,002	\$175,100	\$140,750	\$ 70,750	\$967,000
Total facility costs	229,650	126,748	224,002	175,100	140,750	70,750	967,000
2. Other project funding							
(a) Conceptual design	2,961	350	0	0	0	0	3,311
(b) Other project related costs	250	150	150	100	0	0	650
Total other project funding ..	3,211	500	150	100	0	0	3,961
Total project funding (items 1 and 2)	\$232,861	\$127,248	\$224,152	\$175,200	\$140,750	\$ 70,750	\$970,961

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Total facility costs

(a) Construction line item

Total excludes prior-year projects estimated at \$211,000,000.

2. Other project funding

(a) Conceptual design

Conceptual design cost of \$3,311,000 is necessary to develop a budget quality cost estimate and construction schedule.

(b) Other project related costs

\$650,000 is required for Rocky Flats' subprojects for health physics monitoring.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Nuclear weapons stockpile improvement,
various locations	2. Project No.: 82-D-108
3. Date A-E work initiated: 1st Qtr. FY 1982	5. Previous cost estimate: \$52,300
Date: 1/83
3a. Date physical construction starts: 2nd Qtr. FY 1982	6. Current cost estimate: \$46,800
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1986	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
331	1982	\$15,000	\$ 7,500 a/	\$ 7,500	\$ 864
	1983	27,800	29,800 b/	7,994	2,723
	1984	4,000	4,000	25,806	25,577
	1985	0	5,500	5,500	14,000
	1986	0	0	0	3,636

8. Brief physical description of project

This project provides for design and construction of additional production capability and capacity required to produce parts for selected existing weapons system and for disassembly, assembly, inspection, and recertification. The construction consists primarily of additional equipment, modification of existing buildings, and new facilities.

At the Bendix Plant, Kansas City, Missouri, approximately 18,000 square feet of the existing main manufacturing building will be modified. The existing Solid Film Application Facility will be expanded. Additional manufacturing and certification equipment will be installed and some existing equipment will be relocated in order to expand production capacity, particularly in metal machining, electrical products, electronics, and cable manufacturing. Examples of the types of equipment to be provided include milling machines, chucker lathes, laser weld assembly equipment, and temperature test chambers.

a/ The \$2,000,000 reduction in FY 1982 appropriations is an adjustment to be applied to the FY 1982 general reduction in appropriations of \$51,000,000.

b/ The \$3,500,000 reduction in FY 1983 appropriations is an adjustment to be applied to the FY 1983 general reduction in appropriations of \$16,100,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons stockpile improvement,
various locations

2. Project No.: 82-D-108

8. Brief physical description of project (contd.)

Additional production capacity to be provided at the Y-12 Plant, Oak Ridge, Tennessee, will include procurement and installation of three numerically controlled turning machines, three engine lathes, and one 3-axis mill.

The existing facilities at the Pinellas Plant, St. Petersburg, Florida, will be expanded and partially reoriented to accommodate the stockpile improvement program. A warehouse of approximately 10,300 square feet will be built for classified storage in order to release production floor space currently in use for storage. The building will be of concrete masonry construction having a concrete floor slab on grade and structural steel framing. New equipment to be installed includes numerically controlled lathes and drills.

New weapons assembly facilities are required at the Pantex Plant, Amarillo, Texas. This project will provide one assembly cell, nine assembly bays, and associated support facilities. These facilities will consist of about 36,000 square feet of reinforced concrete structures. The support facilities will include mechanical rooms, inert parts and tool staging spaces, decontamination areas, and restrooms. Equipment to be provided and installed consists of process, certification, and testing equipment required for additional capacity in pressing, machining, and assembly activities. A 1,800 square-foot paint shop will be required.

Additional capacity at the Rocky Flats Plant, Golden, Colorado, will be obtained by modifying existing buildings to accommodate new equipment for plutonium processing. A new casting furnace, a transfer conveyor, a new electron beam welder, and a numerically controlled lathe will be installed.

This project includes provision for additional production capacity associated with uncertainties in the production process. The process uncertainties allowance will provide additional multiaxis machining capability and expansion of the electrical production area at the Bendix Plant if anticipated production yields cannot be achieved.

Required utility services at all plants will be extended from existing building services.

The requested FY 1985 funding will procure part of the standard equipment required to complete this project.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to establish additional capacity in the weapons manufacturing complex to support the weapons stockpile improvement program.

Concerns have arisen about the adequacy of current weapon systems to meet more rigorous demands for safety, security, and command control. The stockpile improvement program will extend over the next several years during a period of high production at the weapons production facilities. Therefore, additional capacity will be required to avoid interference with the production

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons stockpile improvement,
various locations

2. Project No.: 82-D-108

9. Purpose, justification of need for, and scope of project (contd.)

of new weapon systems. The improvement process will include manufacturing of new or redesigned weapon parts and exchange of these parts in the weapon. Some modifications will require substantial disassembly, reassembly, and recertification; this work would be accomplished in the new assembly facilities to be built at the Pantex Plant.

The goal of stockpile improvement is to improve overall safety and security of the current nuclear weapon systems. Plans have been formulated to adjust the stockpile and avoid constraints or reduction in the deterrent value of the stockpile. The presently projected nuclear stockpile improvement program was evaluated on a weapon-by-weapon basis. The initial effort will be limited to a prudent minimum number of weapons. This improvement program will correct only the highest priority concerns to ensure long-term reliability and credibility in the existing weapon inventory and to inhibit unauthorized use. The construction and equipment that will be provided by this project are required to support improvement of the selected weapon systems. If, at a later time, additional weapon systems are included in the stockpile improvement program, additional facilities will be required.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 16% of construction costs, item b		\$ 4,300
b. Construction costs		26,600
(1) Reinforced concrete and earth-covered structures, approximately 36,000 square feet at about \$655 per square foot	\$19,900	
(2) Building additions, modifications, and conveyor system	6,700	
c. Standard equipment, including lathes, metal saws, milling machines, and various production, assembly, and inspection equipment		12,600
	Subtotal	43,500
d. Contingency at approximately 8% of above costs		3,300 b/
	Total estimated cost ..	\$46,800

The estimates by location are as follows:

Bendix Plant, Kansas City, Missouri	\$ 5,400
Y-12 Plant, Oak Ridge, Tennessee	1,700
Pantex Plant, Amarillo, Texas	30,700
Rocky Flats Plant, Golden, Colorado	3,500
Pinellas Plant, St. Petersburg, Florida	5,500
Total	\$46,800

a/ Estimate based on completed conceptual design.

b/ Contingency applies to work to be performed during FY 1984, FY 1985, and FY 1986.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons stockpile improvement,
various locations

2. Project No.: 82-D-108

11. Method of performance

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

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	Total
a. Total project funding				
1. Total facility costs				
(a) Construction line item	\$29,164	\$14,000	\$ 3,636	\$46,800
Total facility costs	29,164	14,000	3,636	46,800
2. Other project funding				
(a) Conceptual design	115	0	0	115
Total other project funding	115	0	0	115
Total project funding (items 1 and 2)	\$29,279	\$14,000	\$ 3,636	\$46,915
b. Other related funding requirements (estimated life of project: 20 years)				
1. Facility operating costs				\$ 190
2. Programmatic operating expenses directly related to these facilities				\$ 1,605
Total other related funding requirements				\$ 1,795

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project funding

Conceptual design was prepared for this project at an estimated cost of \$115,000 for all sites.

b. Other related funding requirements

1. Facility operating costs

Annual facility operating costs estimated at \$190,000 include maintenance, janitorial, and utility services.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Nuclear weapons stockpile improvement,
various locations

2. Project No.: 82-D-108

13. Narrative explanation of total project funding and other related funding requirements (contd.)

2. Programmatic operating costs

Programmatic operating costs estimated at \$1,605,000 annually will cover the manpower necessary to operate the additional facilities.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance

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

1. Title and location of project: Interactive graphics system,
various locations	2. Project No.: 82-D-111
3. Date A-E work initiated: 1st Qtr. FY 1983	5. Previous cost estimate: \$30,600
Date: 1/83
3a. Date physical construction starts: 1st Qtr. FY 1983	6. Current cost estimate: \$28,500
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1987	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1982	\$ 9,000	\$ 0	\$ 0	\$ 0
1983	6,000	4,600 a/	4,600	397
1984	10,600	8,600	8,600	8,503
1985	2,900	6,800	6,800	7,700
1986	0	8,500	8,500	7,700
1987	0	0	0	4,200

8. Brief physical description of project

This project will provide an interactive graphics network for computer-aided design and computer-aided manufacturing activities in six weapons production plants. The project will involve modification of existing factory space and procurement and installation of standard equipment.

Construction at Bendix Plant will involve modification of approximately 12,000 square feet of existing building space to accommodate secure establishment of an interactive graphics system throughout the plant. Space will be prepared for installation of a graphics processor and mass storage unit. Construction will include a raised floor; new heating, ventilation and air-conditioning system; security provisions; modifications to lighting systems; and sprinkler systems. Approximately 57 graphic work stations will be located in the existing plant area. These will operate in the existing environment. Standard equipment to be procured and installed will include 2 mainframe computers, approximately 8 disc drives,

a/ The \$1,400,000 reduction in FY 1983 appropriations is an adjustment to be applied to the FY 1983 general reduction in appropriations of \$16,100,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Interactive graphics system,
various locations

2. Project No.: 82-D-111

8. Brief physical description of project (contd.)

2 plotters, and equipment necessary to establish approximately 57 design/edit graphics work stations and about 90 factory graphics view/takeoff stations. A secure telecommunication network will link the data processors, the graphics stations, and the Secure Automatic Communications Network (SACNET) by which data are transferred among weapon production plants.

At the Pinellas Plant, existing building space will be modified to accommodate an interactive graphics system. Construction will involve upgrading space for computer equipment and will include: raised floor; additional heating, ventilating, and air conditioning; and electronic security measures. Approximately 14 interactive graphics work stations will be established throughout the plant work areas. Equipment to be procured and installed includes hardware for computer enhancement, approximately 2 disc drives, 4 minicomputers, approximately 22 microprocessors, 2 plotters, and equipment to be installed at the graphic work stations. A secure telecommunication network will connect the elements of the interactive graphics system and the SACNET.

At the Pantex Plant, existing space will be modified to accommodate a minicomputer and approximately 18 interactive graphics system work stations located throughout the plant. Equipment to be procured and installed will include 1 minicomputer, 1 microprocessor, and approximately 18 design/edit graphics work stations. Secure telecommunications cabling will be provided to connect the in-plant interactive graphics system network and to link with the SACNET.

At the Mound Facility, approximately 5,000 square feet of building addition will be built to accommodate the central interactive graphics data processing equipment. This will include improvements in heating, ventilating, air-conditioning, and lighting. Equipment to be procured and installed will include 1 disc drive, 2 minicomputers, 2 plotters, and interactive graphics system work station design/edit equipment sufficient to establish approximately 16 work stations. Installation of the interactive graphics system will include secure cabling and a link with the local plant SACNET terminal.

Construction at the Rocky Flats Plant will include modification of space in 6 separate buildings to accommodate installation of approximately 12 design/edit work stations. Equipment to be procured and installed in the Rocky Flats interactive graphics system includes 2 disc drives, plotters, and the necessary elements of design/edit equipment for the interactive graphics system work stations.

At the Y-12 Plant, construction will include building modifications and an extensive secure telecommunications trunk to link interactive graphics system equipment in various existing factory buildings. Standard equipment to be procured and installed at the Y-12 Plant includes 2 mainframe computers, approximately 4 disc drives, and work station equipment for approximately 220 design/edit stations and approximately 33 view/takeoff stations. Four plotters are planned for this system. Secure cabling will connect this interactive graphics system network to the Y-12 Plant SACNET terminal.

A total of 20,200 square feet of space will be prepared for installation of interactive graphics data processing equipment. This includes 15,200 square feet of modified building space. The cost of building modifications includes the cost of relocating present occupants and equipment, plus the cost of telecommunication lines installed to link the interactive graphics systems.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Interactive graphics system,
various locations

2. Project No.: 82-D-111

8. Brief physical description of project (contd.)

It is anticipated that most equipment will be "off-the-shelf" items. Integrating the equipment and siting within existing buildings will require engineering and specification preparation effort exceeding that normally required for procurement and installation of standard equipment.

The total estimated cost of this project has been reduced by \$1,200,000 as a result of deleting the secure telecommunications network requirement at the Rocky Flats Plant and adjusting estimated costs at other plants.

The requested FY 1985 funding will procure part of the standard equipment needed to complete this project.

9. Purpose, justification of need for, and scope of project

Workload increases require an increase in engineering personnel to work in design drafting, tool and gauge design, preparation of product and process designs, automated production machining control, and other graphics operations. The interactive graphics system provided by this project will significantly reduce manpower requirements for this projected workload, will increase productivity of the combined weapons production complex, and can produce substantial cost savings. Some commercial manufacturing activities have experienced production increases in the range of 4-1 to 10-1. Experience with limited interactive graphics equipment at the Pantex Plant has shown a productivity increase of 2-1 in the preparation of control tapes for automated metal turning machines. This savings involved a reduction of effort required to prepare the machine control tapes and included a savings in machine time and a reduction of materials normally lost as rejected parts.

The interactive graphics system to be installed in the individual production plants will allow direct exchange of design information with other production plants and, ultimately, with the weapons design laboratories. The system will be used for tool and gauge design, printed circuit board design, numerical control part programming, facilities engineering, and product engineering. Completion of this project will be a major step toward achieving full economies of factory automation.

The interactive graphics network is expected to increase productivity by more efficiently creating, revising, storing, and distributing graphics documents required in the weapon component production process. Three major benefits expected for the weapons production process include reduced production time, reduced preproduction time, and better capability to restart production.

Experience on a pilot interactive graphics system at the Pantex Plant has shown the programming work for numerically controlled production machines is accomplished on an interactive graphics system 2.6 times faster than with previous manual methods. A programming error results in lost machine time, operator time, and material. An 18-month process development project at the Bendix Plant concluded that in those areas of Bendix manufacturing studied, benefit-to-cost ratios expected from interactive graphics system networks ranged from 2-1 to 5-1. Potential savings in time and cost at all weapons production plants motivates the installation of the interactive graphics system. American private industry has now begun conversion to these systems in many areas because of the reduction in design effort and manufacturing costs that can be

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Interactive graphics system,
various locations

2. Project No.: 82-D-111

9. Purpose, justification of need for, and scope of project (contd.)

achieved. The interactive graphics system offers productivity gains for a broad class of industrial design and manufacturing applications.

Use of interactive graphics in the preproduction phase of introducing new components into production is expected to reduce the number of changes or iterations in all preproduction activities.

Design and production data for weapon systems will be retained as mass storage equipment which will be part of the interactive graphics system. Provision will be made for rapid retrieval of these data so that an existing weapon system can be reintroduced into production or modified at some future date.

The hiring and retention of skilled labor is becoming increasingly difficult in the weapons production complex. An interactive graphics system capability will significantly reduce the number of skilled personnel that must be recruited and processed for security clearances to meet increasing production workloads. Delay of this project will result in little or no relief from the hiring problems and will preclude achievement of productivity improvements.

The incremental operating cost for this project in the first year will be about \$3,000,000. Use of the interactive graphics system by manufacturing plant personnel at their work stations throughout the plant will result in reduced recruitment of plant employees. The incremental operating cost for the system is primarily for system maintenance contracts, supplies, and materials.

The reduction in the cost estimate reflects adjustments made due to current lower-than-anticipated inflation rates for construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Interactive graphics system,
various locations

2. Project No.: 82-D-111

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 14% of construction costs and 7% of standard equipment costs		\$ 2,300
b. Construction costs		7,000
(1) Building modifications, approximately 30,000 square feet at about \$164 per square foot	\$ 4,800	
(2) Secure communications system at Y-12 Plant	2,200	
c. Standard equipment (such as graphics processors, data storage systems, computers), including installation costs		15,900
d. Software - purchase and modification		900
	Subtotal	26,100
e. Contingency at approximately 9% of costs		2,400 b/
	Total estimated cost ...	\$28,500

Estimates by locations are as follows:

Bendix Plant, Kansas City, Missouri	\$11,400
C) Pinellas Plant, St. Petersburg, Florida	3,030
Pantex Plant, Amarillo, Texas	1,400
Mound Facility, Miamisburg, Ohio	3,040
Rocky Flats Plant, Golden, Colorado	1,220
Y-12 Plant, Oak Ridge, Tennessee	8,410
Total	\$28,500

11. Method of performance

Design and engineering of the facilities will be performed under a negotiated architect-engineer contract. Construction, procurement of standard equipment, and installation of equipment will be accomplished by fixed-price contracts awarded on the basis of competitive bids. Purchase of software and services will be administered by the operating contractors on the basis of competitive bids.

a/ Estimate based on completed conceptual designs.

b/ Applies to work to be accomplished in FY 1984, FY 1985, FY 1986, and FY 1987.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Interactive graphics system,
various locations

2. Project No.: 82-D-111

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>Total</u>
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 8,900	\$ 7,700	\$7,700	\$4,200	\$28,500
Total facility costs	8,900	7,700	7,700	4,200	28,500
2. Other project funding					
(a) Conceptual design	100	0	0	0	100
Total other project funding	100	0	0	0	100
Total project funding (items 1 and 2)	\$ 9,000	\$ 7,700	\$7,700	\$4,200	\$28,600
b. Other related funding requirements (estimated life of project: 15 years)					
1. Facility operating costs				\$ 3,000	
Total other related funding requirements				\$ 3,000	

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
1. Other project funding
- (a) Conceptual design

The estimated cost for completing the conceptual design for this project is \$100,000.

- b. Other related funding requirements

It is estimated that the programmatic life of these facilities will be at least 15 years.

1. Facility operating costs

Facility operating costs include utilities, janitorial services, maintenance, and related materials and supplies.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance

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

1. Title and location of project: Weapons production and production support facilities, various locations	2. Project No.: 82-D-146
3. Date A-E work initiated: 2nd Qtr. FY 1982 <u>a/</u>	5. Previous cost estimate: \$72,475 Date: 1/83
3a. Date physical construction starts: 2nd Qtr. FY 1982	6. Current cost estimate: \$71,175 Less amount for PE&D: 275 <u>a/</u> Net cost estimate: \$70,900 Date: 1/84
4. Date construction ends: 1st Qtr. FY 1988	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1982	\$ 8,000	\$ 7,030 <u>b/</u>	\$ 7,030	\$ 1,211
	1983	40,000	28,800 <u>c/</u>	28,798	8,746
	1984	14,200	14,200	14,202	16,354
	1985	0	10,000	10,000	19,100
	1986	8,700	10,870	10,870	15,600
	1987	0	0	0	7,900
	1988	0	0	0	1,989

8. Brief physical description of project

This project provides for new buildings, building modifications, site and facility improvements, and equipment and furnishings at the Kansas City (Bendix), Pantex, Mound, Rocky Flats, and Y-12 locations necessary to increase or enhance weapons production and production support capability and capacity. Each subproject is described briefly below.

- a/ FY 1979 Plant Engineering and Design funding was utilized for Consolidated Materials Laboratories, Bendix Plant, Kansas City (\$175,000) and Upgrade Weapons Staging Area Roads, Pantex Plant (\$100,000).
- b/ The \$970,000 reduction in FY 1982 appropriations is an adjustment applied to the FY 1982 general reduction in appropriation of \$51,000,000.
- c/ The \$11,200,000 reduction in FY 1983 appropriations is an adjustment to be applied to the FY 1983 general reduction in appropriation of \$16,100,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons production and production support facilities, various locations

2. Project No.: 82-D-146

8. Brief physical description of project

Bendix Plant, Kansas City

Consolidated Materials Laboratories - TEC \$7,300,000

This subproject consists of remodeling and upgrading existing materials laboratory facilities and improving space adjacent to the existing laboratory facilities for the relocation and consolidation of numerous other laboratory operations. The consolidated facilities will occupy a total area of slightly more than 25,000 square feet.

Construction features will include ordinary hazard sprinkler systems, liquid waste systems, and utility services (including hot and cold water, chilled water for cooling, steam, dry gaseous nitrogen, compressed air, natural gas, and electrical power). New equipment, including exhaust hoods and blowers and laboratory benches, sinks, and cabinetry, will be provided for the appropriate laboratories. Air-conditioning systems will be modified and new systems will be installed to provide temperature and humidity control for individual laboratory units. The Metallurgical Diagnostics Laboratory unit will be constructed as a Class 10,000 clean room.

An office area will be constructed adjacent to the new and remodeled laboratories to house engineering and support personnel.

Special Plastics Production Facility - TEC \$17,900,000

This subproject will provide two separate buildings. The main building will be approximately 29,000 square feet gross and will include areas for silicone synthesis, cellular silicone compounds, silicone-based composite materials, a zero-discharge area, storage, office, and restrooms. The second building of approximately 4,400 square feet will contain a processing area for nonsilicone-based composite materials. Both buildings will be constructed with clear-span steel frame and steel frame with intermediate columns covered by insulated exterior metal walls and roof panels. Interior treatments will consist of masonry walls, metal stud and gypsum wallboard, concrete subfloor, concrete deck floors, and suspended ceilings in some areas.

A portion of the storage and cellular silicone compounding area requires 15 percent maximum relative humidity control. The remaining cellular silicone area requires 55 ± 10 percent relative humidity; all remaining areas will utilize a standard temperature and humidity environment. Safety features will be installed as necessary, including extra-hazard sprinklers and controls for the zero-discharge room. Standard processing equipment and special design processing systems will be provided.

Electrical Products Manufacturing Building - TEC \$24,200,000

This subproject will provide a new building for light manufacturing that will also include areas for product inspection, laboratories, offices, and restrooms. The building will be approximately 400 feet long by 240 feet wide with a total usable floor space of approximately 200,000 square feet. An additional 51,000 square feet will be provided in a

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons production and production support facilities, various locations

2. Project No.: 82-D-146

8. Brief physical description of project (contd.)

basement area which will house heating, ventilating, and air-conditioning equipment, custodial service station, electrical substation, building maintenance shop, and material storage.

The building will be a preengineered metal building installed on a concrete base. Utilities supplied to the building will include electricity, water, compressed air, and drains. Fire protection for normal hazard occupancy will be provided. Restrooms and elevators will be included.

This subproject will also provide an addition to an existing refrigeration equipment room, including additional chiller equipment, cooling tower, and electrical substation. Some underground utility mains will be rerouted and replacement parking space will be constructed.

Pantex Plant

Upgrade Weapons Staging Area Roads - TEC \$2,200,000

The subproject provides for reworking and widening of existing roadbeds in the weapons staging area. The construction will consist of a new roadbed 15 feet wide in the east half of the staging area and 20 feet wide in the west half of the staging area. Total length will be 35,000 feet. Also included are 13 turning corners with a 95-foot radius, 4 railroad crossings, guard key-post stations consisting of 60 square yards of paving per station, added headwalls, and replacement culverts.

Mound Facility

Production Support Building - TEC \$5,100,000

This subproject consists of remodeling and upgrading existing facilities in a maintenance building and a warehouse and additions to and modification of an existing storage building.

The remodeling and upgrading will provide new shipping and receiving offices, expanded services offices, and automatic data processing (ADP) capacity for materials control. A new explosives bunker and an additional 8,000 square feet of unheated bulk storage space will be built. A 9,000-square-foot office mezzanine will be added to an existing building and approximately 15,400 square feet of new shipping, receiving, and material supply space will be added to an existing building. Appropriate utilities, fire protection, and restroom facilities will be provided.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons production and production support facilities, various locations

2. Project No.: 82-D-146

8. Brief physical description of project (contd.)

Rocky Flats Plant

Production Support Building - TEC \$10,500,000

This subproject provides for a new multiuse facility consisting of a two-story support building of approximately 69,000 square feet: 46,000 square feet of this will be offices, a cafeteria, a lobby, interview areas, conference room, and support areas; the remaining 23,000 square feet will be warehouse. The facility will be accessible to all offsite traffic and functions which routinely involve access by vendors, commercial trucking, and other uncleared persons. The facility will include areas for warehousing, receiving, inspection, and offices. The facility will be designed with an emphasis on energy conservation and efficiency. Construction will consist of a combination of masonry, precast concrete, and structural steel framing as required to satisfy passive solar and structural needs. Additional features include fully insulated walls and roof, automatic fire sprinklers, parking for visitors and employees, paved access areas for warehouse traffic and exterior storage, and security fencing around the facility. Tie-ins to existing utility systems will be made where feasible.

Y-12 Plant

Electronic Standards and Calibration Shop Upgrade - TEC \$3,700,000

This subproject provides for an 8,000-square-foot addition to the northeast corner of an existing electrical shop and modifications to the building which include relocation of partitions and modification of some services. Major equipment to be provided includes numerical control equipment simulators, computer equipment simulators, oscilloscopes, and numerous other equipment certification items.

The requested \$10,000,000 in FY 1985 funding will be used to procure equipment for the special plastics production facility under construction at Kansas City.

9. Purpose, justification of need for, and scope of project

This project provides production space, additional support facilities (such as office space, warehouses, materials certification, and standards laboratories), and road improvements required at five locations. Requirements for these improvements are driven by workload projections for the mid-1980's.

During the decade of the 1970's, a total of 44 new warhead/bomb-types or modified versions were introduced into the stockpile.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons production and production support facilities, various locations

2. Project No.: 82-D-146

9. Purpose, justification of need for, and scope of project (contd.)

Product mix and complexity of weapons delivered are very significant factors in determining the weapons production plants' capacity. Today's weapons are much more complex than those of the early 1970's.

The workload of the 1980's must be accomplished with one less final assembly plant and a manufacturing complex which has aged and deteriorated and requires expansion and upgrading.

The last major expansion of direct manufacturing and manufacturing support space occurred under Project 68-2-a, initiated in FY 1968. Available support space is now saturated. Laboratories, offices, and storage and materials staging space are being preempted or displaced by production activities. At Kansas City (Bendix), Rocky Flats, and Mound, several vital support activities have been, or soon will be, relocated to leased offsite space to release existing onsite support space for production. These activities should be relocated onsite in time to adequately and economically support the production workload of the mid-1980's.

A brief justification for each of the subprojects is provided below:

Bendix Plant, Kansas City - Consolidated Materials Laboratories

This subproject will consolidate the current activities and expansion of several materials analysis and development laboratories. The subproject will provide additional space for metallurgical diagnostics, polymer formulation, chemical testing, and physical testing capabilities. This expansion is essential to meet the requirements for analytical, diagnostic, and material characterization support of the programmatic workload defined by the current Presidentially approved Nuclear Weapons Stockpile Memorandum. With the greater complexity of components, the trend toward increasing the number of tests as well as more sophisticated tests is expected to continue. New weapon programs will continue to increase the workload of the materials evaluation laboratory. The expansion of the materials laboratory is necessary to house additional equipment representing new capabilities and added capacity.

Special Plastics Production Facility

Bendix has been the prime plastics fabricator within the weapons complex for many years. A steadily worsening supply situation for some types of chemicals used in plastic fabrication has plagued this mission in recent years. The special plastics production facility will provide the weapons complex with a production capability for polymeric materials which, for various reasons, are not available from commercial sources in the desired quality or quantities.

Since the mid-1950's, the use of plastic materials in nuclear weapons has increased steadily. However, several incidents have occurred where the supply of commercial polymeric materials for weapons has been either suspended or removed from the market. In some cases, it has become uneconomical for industry to produce the limited quantities of plastic compounds having the very demanding properties uniquely required in the weapons design field. The plastic compounds are needed through not only

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons production and production support facilities, various locations

2. Project No.: 82-D-146

9. Purpose, justification of need for, and scope of project (contd.)

the WR production, but also the stockpile life of the weapon. Many compounds have a limited shelf life before they start to degrade, so several small production runs are required for one plastic compound. In other cases, increasing Occupational Health and Safety Administration (OSHA) and Environmental Protection Agency (EPA) attention to health hazards associated with the production of organic chemicals has jeopardized the supply of materials used in the manufacture of these chemical compounds. Bendix has been increasingly called upon to become the manufacturing source for some of these critical materials because no other such source exists in the weapons complex.

Electrical Products Manufacturing Building

Analysis of the nuclear weapons production schedules through FY 1986 has shown that new building space is required at the Bendix Plant, Kansas City. The current production schedule requires a total plant population of more than 8,300 employees higher than any previous employment level. Until a new building can be provided, space requirements will be accommodated by leasing space.

313 Occupancy of the new building will meet two major objectives: (1) to relieve congestion in existing facilities, and (2) to provide a productive work environment for employees awaiting security clearance.

Manufacturing operations for products including electronic timers, multiwire cable, transformers, flat cables, and the encapsulation operations for these products will be relocated to the new building. Engineering and inspection functions for these manufacturing departments will also be relocated to the new building. Removal of these activities from the main building will make space available for the expansion of remaining manufacturing operations.

The functions in the new building will be structured so that both cleared and uncleared personnel will be utilized in all departments. This feature becomes more important since the time required to obtain security clearances has increased. Clearances now require four to five months.

All uncleared electronic fabrication and assembly personnel will be utilized on production work in the new building after their training is completed and until the time they are cleared (about two months). Uncleared electronic inspectors could also be utilized on productive work in the new building. An experiment conducted recently in the timer and cable fabrication departments revealed that each of the uncleared electronic assemblers earned approximately 70 percent as many standard hours as the cleared electronic assemblers in other departments. The utilization of these uncleared assemblers, plus the utilization of other uncleared support personnel including electronic inspectors, manufacturing supervisors, production planners, and engineers, amounted to a projected savings of \$300,000 annually.

Pantex Plant - Upgrade Weapons Staging Area Roads

The safe-secure trailer traffic is imposing loads on the pavement structure that exceed the design loads. The roads in

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons production and production support facilities, various locations

2. Project No.: 82-D-146

9. Purpose, justification of need for, and scope of project (contd.)

the staging area have deteriorated to the state that repair is not economically feasible. Tractor-trailers and patrol vehicles are running off the road at the corners at the guard key posts, increasing the maintenance in those areas.

Mound Facility - Production Support Building

Introduction of a new tritium technology into the existing Tritium Building necessitates a general relocation of activities from the Tritium Building to three other buildings. There is no acceptable alternative for the placement of the new tritium technology in the Tritium Building. This project will provide modifications and upgrading required to accommodate the necessary relocations. This project will also upgrade facilities to increase capabilities and capacities in line with general support requirements. It will provide improved productivity, responsiveness, safety, and security capabilities in materials management support to all facility programs.

Rocky Flats Plant - Production Support Building

Existing office space at the Rocky Flats Plant consists of permanent structures, 25-year-old mobile trailers, temporary portable buildings, and offsite leases. The plant's present office and manufacturing space is severely overcrowded with no room for expansion. During the 1980's, planned effort at Rocky Flats significantly increases. The total plant growth during the next six years is estimated to be approximately 1,360 people. Approximately 600 of the 1,360 people will be programmatic personnel requiring offices. In addition, it will be necessary to convert 18,000 square feet of office space to production space for the W81, B83, W84, and W87. This further aggravates the office space problem.

The direct benefit of the production support building will be to make space available for additional personnel required to support increased weapons production mission requirements.

The additional warehouse space provided by this project will reduce the current inefficiency created by double and triple handling of select items that are improperly stored. This extra handling causes higher labor costs and increases the potential for damage or breakage of material. The combined effects of these potential costs are conservatively estimated at \$400,000 per year.

Without the new building, it will be necessary to lease additional offsite office space, secure additional temporary onsite buildings; relocate, upgrade, and continue to use 25-year-old trailers; and lease offsite warehouse storage. Approximately 27,000 square feet of offsite office space are currently under lease.

Y-12 Plant - Electronic Standard and Calibration Shop Upgrade

The present facilities are unable to handle the anticipated workload caused by increased production support requirements. The increase in the scheduled plant production workload directly influences the need for expansion of the existing

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons production and production support facilities, various locations

2. Project No.: 82-D-146

9. Purpose, justification of need for, and scope of project (contd.)

electronic shop, standards laboratory, and vacuum technology facilities to accommodate equipment for: maintenance and preparation of measuring and control instrumentation; calibration of gas analyzers, surface finish, nondestructive testing, oscilloscopes, and mass equipment for product certification; and the maintenance of leak detectors and residual gas analyzers. The addition of production system simulators will be needed to support the following types of equipment: remote job entry terminals, computer controllers, numerically controlled controllers, and safeguards equipment. Also, adequate space for these production system simulators will be required. Additional test equipment will also be needed for supporting these expanded facilities and are a part of this project.

A reduction in the cost estimate reflects adjustments made due to current lower-than-anticipated inflation rates for construction.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at 12% of construction cost, item b		\$ 5,700 b/
b. Construction costs		46,700
(1) New buildings, approximately 297,000 square feet at a composite estimate of about \$105 per square foot	\$30,100	
(2) Building modifications, approximately 68,400 square feet at a composite estimate of about \$170 per square foot	11,600	
(3) Special facilities	3,300	
(4) Utilities	1,700	
c. Standard equipment		14,300
	Subtotal	66,700
d. Contingency at approximately 6% of above costs		4,200 c/
	Total estimated cost	\$70,900

a/ Estimate based on completed Title I and Title II designs on two subprojects and on preliminary information from Title I and Title II designs for remaining subprojects.

b/ Excludes \$275,000 Plant Engineering and Design funding at Bendix (\$175,000) and Pantex (\$100,000).

c/ Contingency applies to work to be performed during FY 1984, FY 1985, FY 1986, FY 1987, and early FY 1988.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons production and production support facilities, various locations

2. Project No.: 82-D-146

10. Details of cost estimate (contd.)

The estimates by location and project are as follows:

Bendix Plant, Kansas City, Missouri	\$49,400
Pantex Plant, Amarillo, Texas	2,200
Mound Facility, Miamisburg, Ohio	5,100
Rocky Flats Plant, Golden, Colorado	10,500
Y-12 Plant, Oak Ridge, Tennessee	3,700
Total	\$70,900

11. Method of performance

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

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$26,311	\$19,100	\$15,600	\$ 7,900	\$ 1,989	\$70,900
(b) PE&D	275	0	0	0	0	275
Total facility costs	26,586	19,100	15,600	7,900	1,989	71,175
2. Other project funding						
(a) Conceptual design	165	0	0	0	0	165
(b) Other related project costs	221	0	0	0	0	221
Total other project costs	386	0	0	0	0	386
Total project funding (items 1 and 2)	\$26,972	\$19,100	\$15,600	\$ 7,900	\$ 1,989	\$71,561
b. Other related funding requirement (estimated project life - 20 years)						
1. Facility operating costs						\$ 5,880
2. Programmatic operating expenses directly related to the facilities						51,300
Total other related annual funding requirements						\$57,180

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Weapons production and production support facilities, various locations

2. Project No.: 82-D-146

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Total facility costs

(a) Construction line item

The construction line item includes all costs necessary to complete the facility.

(b) PE&D funding

\$175,000 was provided to Bendix for design of the consolidated materials subproject and \$100,000 provided to Pantex for design and upgrade of weapons staging area roads.

2. Other project-related funding

(a) Conceptual design

A conceptual design is estimated to cost \$165,000 to develop a budget quality cost estimate and schedule.

(b) Other related project costs

Plant startup costs of \$221,000 are required.

b. Other related funding requirements

It is estimated that the programmatic life of this facility will be 20 years.

1. Facility operating costs

The operating cost for the new facility will consist of routine maintenance, maintenance service, utilities service, operator staffing, and expense-type materials.

2. Programmatic operating expenses directly related to the facilities

Personnel costs pertaining to employees to be housed in the facility.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Missile X warhead production facilities, various locations	2. Project No.: 81-D-115
3. Date A-E work initiated: 1st Qtr. FY 1981	5. Previous cost estimate: \$125,000 Date: 3/82
3a. Date physical construction starts: 3rd Qtr. FY 1981	6. Current cost estimate: \$125,000 Date: 1/84
4. Date construction ends: 4th Qtr. FY 1986	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
000	1981	\$10,000	\$ 5,000	\$ 4,826	\$ 2,068
	1982	30,000	9,100	9,268	5,964
	1983	34,100	60,000	60,001	8,884
	1984	30,000	30,000	30,005	56,016
	1985	20,900	20,900	20,900	36,900
	1986	0	0	0	15,168

8. Brief physical description of project

The project will provide new production facilities for the production of a nuclear warhead for the Air Force Missile X (MX) system, now renamed the PEACEKEEPER system. Current Air Force planning calls for deployment of a reentry vehicle in the PEACEKEEPER system called the Advanced Ballistic Reentry Vehicle (ABRV). The nuclear warhead for this vehicle is designated as the W87.

Production of the W87 requires the addition of new production capabilities and increased production capacities at the various production plants. Although design and production methods have been planned, some changes in currently planned types of equipment may be required and the planned construction may require nominal changes. Following are current examples of equipment and facility modifications that are currently planned for this project: (1) facilities for the production of fire-resistant plutonium safety features, (2) nickel plating equipment x-ray shielding, (3) microelectronics production equipment, (4) environmental certification equipment, and (5) equipment for new capability and additional production capacity required. Two new buildings will be required to permit relocating storage and other functions outside existing manufacturing areas at the Bendix

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Missile X warhead production facilities,
various locations

2. Project No.: 81-D-115

8. Brief physical description of project

and Pinellas Plants. A 54,000-square-foot warehouse will be built at the Bendix Plant, and a 22,000-square-foot building will be built at the Pinellas Plant to provide space for W87 manufacturing equipment.

Required utility services which include water, steam, and electricity will be extended from existing building systems.

Weapon production plants that will require building modifications and/or equipment to achieve the necessary W87 warhead production capability include the Y-12 Plant, Oak Ridge, Tennessee; the Bendix Plant, Kansas City, Missouri; the Pantex Plant, Amarillo, Texas; the Pinellas Plant, St. Petersburg, Florida; the Rocky Flats Plant, Golden, Colorado; and the Mound Facility, Miamisburg, Ohio.

The requested FY 1985 funding will complete the project.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide increased capability and capacity in the existing weapons production plants needed to produce the nuclear warhead for an Intercontinental Ballistic Missile (ICBM) W87 reentry vehicle. The warhead will incorporate insensitive high explosive and fire resistance for enhanced safety against plutonium scattering.

→ An agreement has been reached by the DOE and the DOD to proceed with Phase 3 full-scale development of production facilities for the ABRV warhead. The initial operational capability (IOC) date has been established as December 1986.

This project provides for construction of new production facilities required to produce a new warhead of enhanced safety design incorporating insensitive high explosive (IHE) for use with the ABRV. The project estimate provides for the new production capabilities required to manufacture warheads and provides for additional production capacity.

Maximum use will be made of existing manufacturing facilities in preparing for the W87 warhead production program. However, unique features of the new weapon will require capabilities not currently available in the production plants and will require additional capacities to produce the additional numbers of parts at the production plants.

Some process uncertainties are anticipated at this time which will be resolved as Phase 3 proceeds. An allowance of \$5,000,000 has been made in the current cost estimate to cover design uncertainties relating to the facilities required to manufacture the nuclear warhead.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Missile X warhead production facilities, various locations

2. Project No.: 81-D-115

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 17% of construction costs, item b		\$ 9,000
b. Construction costs		54,100
(1) Building modifications, including expansion and conversion of technical areas at the Y-12 Plant, Bendix Plant, Pinellas Plant, and the Mound Facility	\$ 9,000	
(2) Two new buildings, approximately 76,000 square feet total, at approximately \$132 per square foot	10,000	
(3) Special facilities including electroplating lines, metal casting systems, mold heating systems, and for subassembly production facilities	35,100	
c. Standard equipment including presses, milling machines, final assembly, and inspection and certification equipment		44,000
	Subtotal	107,100
d. Contingency at approximately 12% of above costs		12,900 b/
e. Process uncertainties		5,000
	Total estimated cost	\$125,000

The estimates by location are as follows:

Y-12 Plant, Oak Ridge, Tennessee	\$ 46,000
Bendix Plant, Kansas City, Missouri	16,400
Mound Facility, Miamisburg, Ohio	31,800
Rocky Flats Plant, Golden, Colorado	15,800
Pantex Plant, Amarillo, Texas	2,000
Pinellas Plant, St. Petersburg, Florida	8,000
Uncertainties	5,000
Total	\$125,000

11. Method of performance

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

a/ Estimate based upon a completed conceptual design.

b/ Contingency applies to work to be performed during FY 1983, FY 1984, FY 1985, and FY 1986.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Missile X warhead production facilities, various locations

2. Project No.: 81-D-115

12. Funding schedule of project funding and other related funding requirements

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>Total</u>
a. Total project funding				
1. Total facility costs				
(a) Construction line item	\$72,932	\$36,900	\$15,168	\$125,000
Total facility costs	72,932	36,900	15,168	125,000
2. Other project funding				
(a) Conceptual design	300	0	0	300
Total other project funding	300	0	0	300
Total project funding (items 1 and 2)	\$73,232	\$36,900	\$15,168	\$125,300

b. Other related funding requirements (estimated life of project: 5 years)	
1. Facility operating costs	\$ 6,000
2. Programmatic operating expenses directly related to the facility	15,000
Total other related funding requirements	\$21,000

13. Narrative explanation of total project funding and other related funding requirements

- a. Total project funding
1. Other project funding
- (a) Conceptual design

Conceptual design costs of approximately \$300,000 will be incurred in the process of developing and improving the project cost estimate and schedule.

- b. Other related funding requirements

It is estimated that the programmatic life of these facilities will be at least five years.

1. Facility operating costs

Approximately \$6,000,000 per year will be spent to cover the cost of utilities, maintenance, janitorial services and related overhead costs for the new W87 production facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Missile X warhead production facilities,
various locations

2. Project No.: 81-D-115

13. Narrative explanation of total project funding and other related funding requirements (contd.)

2. Programmatic operating expenses directly related to the facility

The annual cost of direct labor, materials and supplies, tooling procurement, tooling fabrication, and overhead is estimated at \$15,000,000 per year while operating at full production.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance
(Tabular dollars in thousands. Narrative material in whole dollars.)

1. Title and location of project: Control of effluents and pollutants, Y-12 Plant, Oak Ridge, Tennessee	2. Project No.: 81-D-120
3. Date A-E work initiated: 4th Qtr. FY 1979	5. Previous cost estimate: \$6,400 Date: 1/83
3a. Date physical construction starts: 3rd Qtr. FY 1983 <u>a/</u>	6. Current cost estimate: \$9,039 Less amount for PE&D: \$1,239 <u>a/</u> Net cost estimate: \$7,800 Date: 1/84
4. Date construction ends: 4th Qtr. FY 1987	

7. Financial schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1981	\$3,000	\$3,000	\$2,000	\$ 0
1982	3,400	2,400 <u>b/</u>	-2,000 <u>b/</u>	0
1983	0	0	5,400 <u>c/</u>	388
1984	0	1,000	1,000	2,000
1985	1,400	1,400	1,400	3,000
1986	0	0	0	2,400
1987	0	0	0	12

a/ Design for this project was authorized and funded under Project 79-8, Plant Engineering and Design, Various Locations.

b/ \$1,000,000 in FY 1981 appropriations was deferred in support of the FY 1981 Augmented Test Program. These funds were not restored in FY 1982.

c/ The financial schedule reflects the application of the FY 1982 general reduction in weapons production and surveillance appropriations established in Conference Report No. 97-345, which accompanies H.R. 4144. Of the amount appropriated through FY 1982, \$5,000,000 was assigned to the \$51,000,000 general reduction when it became apparent that the available funding was insufficient to permit invitations to bidders for the construction planned. The \$5,000,000 was reallocated to this project in August 1983.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Control of effluents and pollutants,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 81-D-120

8. Brief physical description of project

This project includes the installation of new treatment facilities to control releases of gaseous and liquid pollutants from the Y-12 Plant. New pollution control facilities to be provided include hydrogen fluoride scrubbers to process gaseous effluents from uranium recovery processes and a central pollution control facility to treat chemical acid wastes.

Hydrogen fluoride scrubbers will be installed in two existing buildings where enriched uranium recovery processes are located. Recirculating scrubbers will be designed to use water or potassium hydroxide solution to capture gaseous effluents from fluid bed reactors used in the conversion of uranium dioxide to uranium fluoride. Dual bank storage arrays will be provided for storage of waste solution from the scrubbers. Canned rotor pumps will be used for scrub solution recirculation. Plastic lined tankers will be provided for transport of this solution to the disposal site. Some demolition and relocation of existing facilities will be necessary. Utility and electrical services will be extended from nearby existing service headers.

The central pollution control facility will consist of a new multilevel building having approximately 20,000 square feet of floorspace and chemical processing equipment for treatment of liquid acid wastes. The building will be a 4-level preengineered building and will include space for an office, control room, chemical laboratory, and restrooms. The basement level will contain waste collection vessels. The first floor will house the support facilities and reverse osmosis filtration and sludge packaging equipment. A reactor clarifier, settling tanks, and electrical service equipment will be installed on the second floor. Process reactors and recycle water head tanks will be installed on the third floor. An existing cooling tower basin will be converted for storage of incoming wastes and effluents. Construction of process systems will use polyolefin collection tanks, polyvinyl chloride piping, acid brick, and special alloy metals such as stainless steel and hasteloy. The central pollution control facility will be located within the main processing area of the Y-12 Plant near the sources of the liquid waste to be treated.

When appropriations for this project became incumbered by funding deferral and general reduction of FY 1982 appropriations, a new centrifuge system for cleanup of electrochemical machining coolants and protection for a drainage point (originally included in this project) was deleted from the project and completed using general plant project funding. Design of the remaining work is complete and prepared for construction contracting. The majority of the cost increase was for increased space and equipment requirements for treatment of effluents not anticipated in the original conceptual design.

The requested FY 1985 funding will complete the project.

9. Purpose, justification of need for, and scope of project

The purpose of this project is to provide facilities for treatment of gaseous and liquid effluents from the Y-12 Plant required to comply with State of Tennessee and Federal air and water pollution control regulations.

Present gaseous hydrogen fluoride emissions to the atmosphere from the Y-12 Plant enriched uranium recovery operations occasionally exceed State of Tennessee standards which pertain under the 1977 Amendments to the Clean Air Act. Further, the

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Control of effluents and pollutants,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 81-D-120

9. Purpose, justification of need for, and scope of project (contd.)

emission rates are expected to increase significantly over the next several years due to projected increases in the level of uranium recovery operations. Facilities are required for effective treatment of the hydrogen fluoride emissions to bring the Y-12 Plant into compliance with the State of Tennessee standards. Authorization of this project will permit the Y-12 Plant to establish a schedule for compliance with the current standards and possibly avoid litigation and noncompliance penalties.

Waste streams generated from plant production facilities are currently being discharged into percolation ponds as a means of waste disposal. This practice must be discontinued in order to comply with the Federal Water Pollution Control Act (FWPCA) and the Resource Conservation and Recovery Act (RCRA). The Y-12 Plant has been instructed by both Federal and State of Tennessee environmental organizations to phase out the use of percolation ponds. In 1983, the State of Tennessee directed the Y-12 Plant to terminate releases of pollutants into the ponds. A new Central Pollution Control Facility is needed to meet current water pollution control requirements. Liquid pollutants which require treatment include cleaning, pickling, and plating wastes which are currently being discharged into seepage ponds. The central pollution control facility to be provided by this project will permit the Y-12 Plant to terminate this seepage disposal. A significant reduction of liquid pollutants into the seepage ponds was effected by recent completion of the new recycle and denitrification facility. However, wastes that continue to be discharged into the seepage ponds are known to contain such pollutants as uranium, beryllium, chromium, nickel, copper, nitrates, and fluorides. The central pollution control facility will also treat solutions used to clean floors in certain process areas which become contaminated with beryllium and uranium particulates.

The annual facility operating cost associated with this project is estimated at \$600,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Control of effluents and pollutants,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 81-D-120

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 9% of construction costs, item b		\$ 560 b/
b. Construction costs		6,220
(1) Improvements to land	\$ 190	
(2) New building, approximately 20,000 square feet at about \$112 per square foot	2,240	
(3) Special facilities, including gas scrubbers and centrifuge system	3,600	
(4) Utilities, including power, water, and sewage connections	190	
c. Standard equipment		30
	Subtotal	6,810
d. Contingency at approximately 15% of above costs		990 b/
	Total estimated cost	\$ 7,800 c/

11. Method of performance

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

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$ 2,388	\$ 3,000	\$ 2,400	\$ 12	\$ 7,800
(b) Plant engineering and design	1,239	0	0	0	1,239
Total facility costs	3,627	3,000	2,400	12	9,039
2. Other project funding					
(a) Conceptual design	50	0	0	0	50
Total other project funding	50	0	0	0	50
Total project funding (items 1 and 2)	\$ 3,677	\$ 3,000	\$ 2,400	\$ 12	\$ 9,089

a/ Based upon completed Title I and Title II design.

b/ Contingency applies to work to be performed in FY 1983, FY 1984, FY 1985, FY 1986, and FY 1987.

c/ Excludes FY 1979 design funding of \$1,239,000 provided under Project 79-8, Plant Engineering and Design, Various Locations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Control of effluents and pollutants,
Y-12 Plant, Oak Ridge, Tennessee

2. Project No.: 81-D-120

12. Funding schedule of project funding and other related funding requirements (contd.)

b. Other related funding requirements (estimated life of project: 20 years)

1. Facility operating costs	\$ 600
Total other related funding requirements	\$ 600

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Plant engineering and design

Title I and Title II design of this project was begun in FY 1979 using funds provided under Project 79-8, Plant Engineering and Design.

2. Other project funding

(a) Conceptual design

Approximately \$50,000 was required to prepare a conceptual design, preliminary schedule, and cost estimate for this project.

It is estimated that the programmatic life of this facility will be 20 years.

1. Facility operating costs

Facility operating costs of \$600,000 are projected. This includes utilities, maintenance, janitorial services, and overhead.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Weapons Production and Surveillance

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

1. Title and location of project: Universal pilot plant, Pantex Plant, Amarillo, Texas	2. Project No.: 79-7-o
3. Date A-E work initiated: 4th Qtr. FY 1979	5. Previous cost estimate: \$12,600 Date: 12/80
3a. Date physical construction starts: 2nd Qtr. FY 1985	6. Current cost estimate: \$20,400 Date: 1/84
4. Date construction ends: 3rd Qtr. FY 1987	

7. Financial schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	1979	\$3,500	\$ 3,500	\$ 390	\$ 5
	1980	3,900	3,900	213	307
	1981	0	-6,900 a/	46	175
	1982	5,200	500 b/	351	307
	1983	0	0	0	40
	1984	0	0	0	166
	1985	3,800	15,400	15,400	5,000
	1986	4,000	4,000	4,000	9,500
	1987	0	0	0	4,900

a/ In FY 1981, all available appropriations (\$6,900,000) were redirected to Project 78-16-a, Cruise Missile Production Facilities, Various Locations, and the planned start of construction was postponed.

b/ This financial schedule reflects the application of the FY 1982 general reduction in weapons and surveillance appropriations established in Conference Report No. 97-345 which accompanies H.R. 4144. Of the \$12,100,000 appropriations provided in FY 1982, \$11,600,000 was assigned to the \$51,000,000 general reduction, leaving \$500,000 in new obligational authority for this project to permit completion of Title I and Title II design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Universal pilot plant, Pantex Plant,
Amarillo, Texas

2. Project No.: 79-7-o

8. Brief physical description of project

This project will replace an inadequate existing chemical processing facility used to synthesize pilot quantities of new explosives for evaluation and use in the weapons program. A total gross building area of approximately 18,700 square feet will be constructed.

The new universal pilot plant will be a 22-foot high heavily reinforced concrete structure with blast-venting walls. This type of construction will control the direction of blast forces and missiles that would result from an accidental explosion inside the facility and minimize damage and/or loss of life in work areas inside and outside the facility. The principal features in the new facility are four operating bays, a remote control operating center, and supporting facilities for each of the four operating bays.

Each of three high explosive processing bays will be approximately 1,200 square feet in area and 20 feet high. A fourth bay will be used for drying, packaging, storage, and analytical testing. The remote control and monitoring center will be approximately 1,100 square feet in area and 8 feet high. A 600-square-foot support analytical laboratory will contain equipment for in-process analysis of the high explosives being produced in this facility. Approximately 1,200 square feet of inert storage area will be provided for setting aside process equipment temporarily not required in a special processing operation. Two heavily reinforced concrete in-process staging bays will be provided for temporary storage for up to 1,000 pounds of high explosive products. Each processing area will be provided with its own support systems, making it possible to operate them concurrently, independent of and protected from each other. Support facilities will include enclosed corridors connecting to other facilities, mechanical equipment for air conditioning and heating, exterior storage for acids and solvents, a solvent recovery system, and a system to control waste water and acid.

A piping system for the transfer of acids and solvents from exterior storage tanks to the processing area will be controlled from each area. Inside, the chemicals will be transferred by a flexible piping system with plug-in connections to the processing equipment. Overhead cranes will be provided to relocate the processing equipment as required for different manufacturing procedures.

All inhabited areas will be heated and cooled. Evaporative cooling will be used in the process areas. A separate mechanical system will be provided for heating and cooling the chemical reactors. Each process area will have a floor sweep, a point of source, and a general area exhaust system interlocked with the safety alarm. Every area where explosives are handled will be protected by a high speed, primed deluge sprinkler system with ultraviolet flame detectors. All other areas will be protected by standard sprinkler systems.

Service roads, security fencing and lighting, plant paging system, electric power, water, sewer, and surface drainage will be provided by this project.

The increase in the total estimated cost of this facility has resulted from changes in design criteria for facilities used in the manufacturing, handling, and storage of high explosives. The Department of Energy (DOE) designs for all new high

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Universal pilot plant, Pantex Plant,
Amarillo, Texas

2. Project No.: 79-7-o

8. Brief physical description of project (contd.)

explosives facilities incorporate criteria developed by the Department of Defense (DOD) for military munitions facilities. In addition, interim safety criteria were developed by DOE subsequent to the March 1977 accidental explosion at the Pantex Plant which destroyed a high explosive machining facility. These criteria are incorporated in the current design revision. The initially proposed site of the new universal pilot plant has been changed to diminish potential hazard to nearby facilities. These design changes will result in a facility that will contain or control missiles propelled by an accidental explosion. Title I and Title II design has been completed. The total estimated cost of the project, based upon completed design and escalation associated with a 3-1/2 year delay in the construction completion schedule, exceeds the FY 1981 estimate by about 60 percent. Construction will not start until FY 1985 authorization and appropriations are obtained.

The requested FY 1985 funding will initiate major construction.

9. Purpose, justification of need for, and scope of project

The present facility for process development and manufacture of pilot quantities of explosives is a two-story building which was built in 1944 and was rehabilitated in 1967. Since that time, it has been extensively remodeled in order to provide chemical processing capabilities to produce explosives for evaluation and use in weapons applications. The present facility is inadequate to meet present and future explosive synthesis operations in full compliance with existing safety standards. An accidental explosion in the existing facility would cause a complete loss of the existing pilot plant facility. Synthesis operations have been permitted to continue on a temporary basis in the present rehabilitated building until a new pilot plant facility can be designed and constructed. A new facility is required that will meet projected capacity needs, will comply with safety standards, and will provide adequate safeguards.

The universal pilot plant described above is required to manufacture explosives for the weapon design laboratories for their use in evaluating and characterizing new materials for potential weapons applications. Commercial sources have not been satisfactory in the past due to the small quality requirement in the evaluation period of new explosives, their lack of good quality control on small orders, and their lack of interest in exchanging technical processing techniques and information. This pilot plant will also supply production requirements for some explosives needed in quantities too small to be of interest to commercial explosives manufacturers.

Four operating areas will be provided: (1) a small batch, continuous processing, quality control area; (2) intermediate capacity batch operations area with up to 400-litre chemical reactors; (3) large reactor vessel area with up to 800-litre capacity and with remote operation; and (4) oven drying and packaging area.

Currently, there are no existing structures suitable for use for the chemical processing required to manufacture explosives except the existing building which has been declared inadequate to meet present safety criteria.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Universal pilot plant, Pantex Plant,
Amarillo, Texas

2. Project No.: 79-7-o

9. Purpose, justification of need for, and scope of project (contd.)

The number of operating personnel will vary based on the work schedule. The existing facility has required two supervisors and five operators for the last two years. The new facility is anticipated to require two supervisors and four operators.

The savings in operating cost associated with this construction project will be approximately \$20,000 per year.

10. Details of cost estimate a/

	Item cost	Total cost
a. Engineering, design, and inspection at approximately 10% of construction costs, item b		\$ 1,640
(1) Title I and Title II design of construction	\$ 1,000	
(2) Construction inspection	640	
b. Construction costs		15,200
(1) Improvements to land including fencing, excavation, paving, and culverts	520	
(2) Buildings - heavily reinforced concrete structures, approximately 18,700 square feet at about \$658 per square foot	12,200	
(3) Special facilities including chemical storage and solvent recovery system	2,100	
(4) Utilities including water, power, steam, and sewer extensions	380	
c. Standard equipment including chemical reactors, header tanks, pumps, meters, and laboratory equipment		1,660
	Subtotal	18,500 b/
d. Contingency at approximately 10% of above costs		1,900 c/
	Total project cost ...	\$20,400

11. Method of performance

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

a/ Based upon completed Title I and Title II design.

b/ Includes cost of construction management by the U. S. Army Corps of Engineers.

c/ Contingency applies to work to be performed during FY 1985, FY 1986, and FY 1987.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Universal pilot plant, Pantex Plant,
Amarillo, Texas

2. Project No.: 79-7-o

12. Funding schedule of project funding and other related funding requirements

	Prior Years	FY 1985	FY 1986	FY 1987	Total
a. Total project funding					
1. Total facility costs					
(a) Construction line item	\$1,000	\$5,000	\$9,500	\$4,900	\$20,400
Total facility costs	1,000	5,000	9,500	4,900	20,400
2. Other project funding					
(a) Conceptual design	6	0	0	0	6
Total other project funding	6	0	0	0	6
Total project funding (items 1 and 2)	\$1,006	\$5,000	\$9,500	\$4,900	\$20,406
b. Total related funding requirements (estimated life of project: 20 years)					
1. Facility operating costs					\$ 385
Total other related annual funding requirements					\$ 385

13. Narrative explanation of total project funding and related funding requirements

a. Total project funding

1. Total facility costs

(a) Construction line item

The construction line item includes all costs necessary to complete the facility.

2. Other project related funding

(a) Conceptual design

A conceptual design was prepared prior to FY 1980 at a cost of \$6,000 to develop a budget quality cost estimate and schedule.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Universal pilot plant, Pantex Plant,
Amarillo, Texas

2. Project No.: 79-7-o

13. Narrative explanation of total project funding and related funding requirements (contd.)

b. Total related funding requirements

It is estimated that the programmatic life of this facility will be 20 years.

1. Facility operating costs

The operating costs for the new facility will consist of routine maintenance, maintenance service, utilities service, operator staffing, and expense-type materials. The existing facility has required two supervisors and five operators for the past two years and has cost approximately \$360,000 per year. The operating staff will be reduced by one person. Some additional utility, maintenance, and janitorial services will be incurred to reduce the net annual operating costs by approximately \$25,000.

020

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
<u>Program Direction</u>	\$57,495	\$60,229

Included within the Weapons Program Direction request is funding to support the following areas:

- Office of the Assistant Secretary for Defense Programs
- Office of Military Application
- Office of Inertial Fusion
- Albuquerque Operations Office
- Nevada Operations Office
- Community Assistance Programs at Los Alamos, New Mexico, and Oak Ridge, Tennessee

Office of the Assistant Secretary for Defense Programs

The Office of the Assistant Secretary for Defense Programs provides overall direction and administration of Defense Programs activities to assure that operations are conducted in the most efficient manner consistent with Defense Programs mission objectives. Some specific support functions carried out by this office include:

- overall management of activities related to the accomplishment of the Defense Programs mission;
- advising the Secretary of Energy on national security matters;
- providing senior management program direction and guidance;
- coordination of the development of Defense Programs plans and budgets;
- review of congressional proceedings and legislation impacting Defense Programs and development and coordination of Defense Programs congressional testimony preparation and presentation;
- providing the Assistant Secretary with information regarding the effectiveness of national security nuclear weapons development and production activities;
- management of the long-range planning process of the laboratories and Defense Programs participation in the Institutional Planning Process;
- management of Defense Programs manpower utilization and allocation function;
- development, implementation, coordination, and management of the Assistant Secretary's policy analysis program;
- reviewing, coordinating, commenting on, and making recommendations on Department of Energy activities, orders, and reports that affect Defense Programs management and planning; and
- exercising responsibility for the energy and utility management program within the Defense Programs complex, maintaining cognizance over field office/contractor energy/utility management activities, and maintaining contacts with the Department of Energy's energy organizations.

Office of Military Application

Program management and support functions performed by Office of Military Application personnel in support of the overall objectives of the weapons program include:

- program management, direction, and support;
- development of program goals and objectives;
- formulation of plans and budgets for program accomplishment;
- presentation and defense of the proposed budgets to the President and the Congress;
- conduct of studies, analyses, and evaluations to assure proper program accomplishment;
- coordination of programs with other Federal agencies, the Office of Management and Budget, Congress, and numerous contractors;
- management of the nuclear weapons complex in an effective and efficient manner; and
- execution of plans and directives for development and production of nuclear weapons.

Office of Inertial Fusion

Program management and support functions performed by Headquarters personnel in support of the overall objectives of the Inertial Confinement Fusion program include:

- managing the overall national Inertial Confinement Fusion program using the lead laboratory framework;
- developing program goals, objectives, and priorities;
- planning of the program and implementing plans to meet goals and objectives;
- monitoring, evaluating, and approving mainline program efforts at the weapons laboratories;
- presenting and defending the proposed budgets to the Office of Management and Budget and the Congress; and
- coordinating program efforts with field offices, other Federal agencies, and contractors.

Albuquerque Operations Office

The Albuquerque Operations Office's primary goal is the effective management and oversight of the weapons research, development, and production programs. An integral part of this effort is the coordination and integration of weapons program activities at Sandia National Laboratories, Los Alamos National Laboratory, and seven production facilities. Albuquerque is also responsible for the planning, scheduling, distribution, and safe transportation of all shipments of Government-owned strategic quantities of special nuclear materials and the effective management of all assigned program and project activities including energy and nonweapons programs.

Albuquerque's major objective is the successful execution of assigned programs for manufacturing, quality assurance, safety, and transportation of nuclear weapons. To carry out their mission, Albuquerque uses the services of Government-owned, contractor-operated facilities located throughout the United States, employing more than 30,000 in FY 1985.

Nevada Operations Office

The Nevada Operations Office is responsible for managing the Nevada Test Site, currently the only area in the United States approved for underground nuclear testing. This responsibility consists of providing the Government-owned facilities site engineering, construction, and logistical support for conducting nuclear testing. These objectives are accomplished by the utilization of a small cadre of Federal employees who provide management oversight of the work being performed by contractor personnel.

Community Assistance Program

The Department of Energy administers the Community Assistance Program under Section 91 of the Atomic Energy Community Act of 1955, as amended, to provide assistance to specified units of local government in the communities associated with the Los Alamos National Laboratory and Oak Ridge energy complex. The statutory purpose of the assistance is to compensate the Los Alamos and Oak Ridge communities for their lack of an industrial or commercial tax base and to attract and retain employees at the Federal energy facilities in those communities.

The Department of Energy has implemented the statutory mandate by entering into assistance contracts with Los Alamos County, the Los Alamos County School Board, the City of Oak Ridge, and Roane County, Tennessee, utilizing the funding formula adopted in 1979 by the Department of Energy Working Group on Community Assistance. The contracts specify the amounts of assistance the Department has agreed to supply, based on the statutory standards of need. To insure satisfaction of the statutory requirement that the communities make full use of their own resources, the Department has entered into agreements with the City of Oak Ridge, Roane County, and Los Alamos County, as recommended by the Department of Energy Working Group on Community Assistance, to finance projects designed to reduce the long-term dependence of the communities on assistance from the Department of Energy. This financing is in the amount of 10 percent of the assistance payments computed by the contract formula for the recipients at Oak Ridge and 5 percent of the assistance payments for Los Alamos County, to be matched by equal amounts from the recipients. The Department also has commitments to provide assistance payments and self-sufficiency project funding to Anderson County, Tennessee, on the same basis.

PROGRAM DIRECTION FUNDING REQUIREMENTS

The total operating funds, including assistance payments to the Los Alamos and Oak Ridge communities, are presented in the following table:

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Request</u>
Office of the Assistant Secretary for Defense Programs ..	\$ 1,615	\$ 1,670
Office of Military Application	4,245	4,430
Office of Inertial Fusion	900	935
Albuquerque Operations Office	25,883	27,555
Nevada Operations Office	12,140	12,999
Community Assistance Program - Los Alamos	6,720	7,274
Community Assistance Program - Oak Ridge	5,992	5,366
Total	\$57,495	\$60,229

These funds provide for the salaries, other personal services, benefits, travel expenses, and contractual services for the following levels of Federal employees:

	<u>FY 1984</u> <u>Full-Time</u> <u>Equivalents</u>	<u>FY 1985</u> <u>Full-time</u> <u>Equivalents</u>
Office of the Assistant Secretary for Defense Programs ..	30	30
Office of Military Application	91	91
Office of Inertial Fusion	16	15
Albuquerque Operations Office	530	528
Nevada Operations Office	252	248
Total	919	912

Implementation of Grace Commission Recommendations

On June 30, 1983, President Reagan established a private sector executive committee under the chairmanship of J. Peter Grace to perform a survey on cost control in the executive branch of the Federal Government. This committee's objectives were to identify opportunities for increased efficiency and reduced costs, determine areas where managerial accountability could be enhanced and administrative controls improved, suggest short- and long-term managerial operating improvements, and specify areas where further study could be justified by potential savings. Based on the findings of this Committee, a concerted effort will be made in FY 1984 to initiate implementation of the Committee's recommendations. Accordingly, this budget request contains planned reductions in Federal manpower in FY 1984 and FY 1985 based on achieving management efficiencies through implementation of the Committee's recommendations. Also, special studies will be conducted to determine the feasibility of contracting out administrative-type activities into the private sector.

Federal Manpower Funding

Funding associated with the requested Federal positions for salaries and other personal services, benefits, and travel is outlined below:

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
Office of the Assistant Secretary for Defense Programs	\$ 1,565	\$ 1,620
Office of Military Application	4,245	4,430
Office of Inertial Fusion	900	935
Albuquerque Operations Office	21,598	22,695
Nevada Operations Office	10,578	10,957
Total	<u>\$38,886</u>	<u>\$40,637</u>

Contractual Services

Funding is also included for those contractual services and supplies necessary to support the annual administrative requirements for operations at Albuquerque and Nevada. In addition, \$50,000 is allocated for personnel training requirements and certain other miscellaneous expenses at Headquarters such as graphics and printing that were previously fully funded under Departmental Administration.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
Albuquerque Operations Office	\$ 4,285	\$ 4,860
Nevada Operations Office	1,562	2,042
Office of the Assistant Secretary for Defense Programs	50	50
Total	<u>\$ 5,897</u>	<u>\$ 6,952</u>

With the exception of communications and utilities, supplies, materials, and services have increased by 7 percent at both Albuquerque and Nevada Operations Offices.

At Albuquerque, communication costs are estimated to escalate at an annual rate of 15 percent. As a result of natural gas deregulation and the extensive use of natural gas at Kirtland Air Force Base in steam generation, utility costs are anticipated to increase at a rate of 15 percent per year.

At Nevada, an increase in communication charges is based on possible tariff increases being filed by Centel. Also, replacement of the PBX equipment by Centel will increase costs. The cost of vehicle services will increase by about 10 percent because of increased maintenance cost due to vehicles reaching replacement age.

JUSTIFICATION FOR COMMUNITY ASSISTANCE PAYMENTS

The requested level of funding for the Community Assistance Program will support the Department's obligations under assistance contracts.

A detailed summary of funding for the program by year and type of assistance follows:

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Request</u>
<u>Los Alamos</u>		
Civic Activities	\$ 30	\$ 30
County:		
Assistance Payments	1,799	1,919
Schools--Assistance Payments	4,891	5,325
Subtotal	<u>6,720</u>	<u>7,274</u>
<u>Oak Ridge</u>		
Assistance Payments:		
City of Oak Ridge	3,180	2,880
Anderson County	1,330	1,373
Roane County	1,482	1,113
Subtotal	<u>5,992</u>	<u>5,366</u>
Total Community Assistance	<u>\$12,712</u>	<u>\$12,640</u>

The estimate of \$30,000 for civic activities at Los Alamos is requested to cover the cost of maintaining Federal facilities located in the community. The requested amounts for assistance payments will fund the Department of Energy's obligation, as determined in accordance with the formula described in the contracts with the county and the schools, based on the provisions of the Atomic Energy Community Act of 1955, as amended.

Similarly, the City of Oak Ridge, Anderson County, and Roane County continue to require financial assistance under the Atomic Energy Community Act of 1955, as amended. The financial assistance estimates are derived by a formula recommended by the Department of Energy Working Group on Community Assistance. The reduced funding in FY 1985 is due to the reduction of the number of Department of Energy employees residing in these communities.

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DEPARTMENT OF ENERGY
 FY 1985 CONGRESSIONAL BUDGET REQUEST
 LEAD TABLE
 VERIFICATION AND CONTROL TECHNOLOGY

Atomic Energy Defense Activities
 (Tabular dollars in thousands. Narrative material in whole dollars.)

	FY 1983 Appropriation	FY 1984 Appropriation	FY 1985 Base	FY 1985 Departmental Request
Verification and Control Technology (DP)				
Verification and Control Technology				
Operating Expenses	\$ 50,225	\$ 63,350	\$ 63,350	\$ 70,500
Capital Equipment	1,500	1,750	1,750	2,000
Construction	0	0	0	1,000
Subtotal	<u>51,725</u>	<u>65,100</u>	<u>65,100</u>	<u>73,500</u>
Program Direction				
Operating Expenses	2,175	2,750	2,750	3,200
Subtotal	<u>2,175</u>	<u>2,750</u>	<u>2,750</u>	<u>3,200</u>
Total				
Operating Expenses	52,400	66,100	66,100	73,700
Capital Equipment	1,500	1,750	1,750	2,000
Construction	0	0	0	1,000
Verification and Control Technology	<u>53,900</u>	<u>67,850</u> a/	<u>67,850</u> a/	<u>76,700</u>
Total FTE's	53	60	60	60

Authorization: Sections 35 and 36, P.L. 87-297

a/ Includes FY 1984 Supplemental Request of \$6,200,000 in Operating Expenses.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF CHANGES
Verification and Control Technology
(In Thousands of Dollars)

FY 1984 Appropriation	\$ 67,850
Built-in increases and decreases:	
Pay cost	80
FY 1985 base.....	67,930
Program increases and decreases:	
o Detection Technology	
Supports increased space detection activities in support of treaty verification and other monitoring requirements.....	+ 4,610
o Analytical Support	
Supports internally and externally levied requirements for technical analyses of arms control, export control, foreign nuclear weapon and proliferation issues as they relate to DOE's areas of responsibilities.....	+ 1,133
o Program Direction	
Provides for increased Federal manpower expenses related to the management of programmatic and staff responsibilities....	+ 370 <u>a/</u>
o Construction	
Provides for initiation of Project 85-D-171, Space Science Laboratory, in support of satellite fabrication and technology development efforts, TEC \$7.5 million.....	+ 1,000
o Capital Equipment	
Provides for equipment needs of technical and analytical activities.....	+ 207
o Escalation	
Provides funding to cover estimated escalation in operating expenses and capital equipment as they relate to technical and analytical activities.....	+ <u>1,450</u>
FY 1985 budget request.....	\$ 76,700

a/ The increase in Program Direction is based on the upcoming FY 1984 reprogramming action necessary to provide funds for an increased staff ceiling over FY 1983.

Department of Energy

FY 1985 CONGRESSIONAL BUDGET REQUEST
PROGRAM OVERVIEW

VERIFICATION AND CONTROL TECHNOLOGY

The overall goal of the Verification and Control Technology program is to support U.S. national security and foreign policy development and execution in the areas of treaty verification, intelligence, arms control and export control as they relate to nuclear weapons issues. In fulfilling these responsibilities the program: 1) develops and produces technology to monitor nuclear explosions and to verify nuclear weapon testing treaties; 2) controls the export of technology related to Department of Energy (DOE) areas of responsibility; 3) provides technical and analytical support for the Department's role in nuclear arms control negotiations; and 4) manages DOE's intelligence responsibilities.

FY 1984 accomplishments include the:

- o Deployment and operation of an experimental regional seismic array in Norway in cooperation with Defense Advanced Research Projects Agency (DARPA) to determine value of this technology for verifying treaties limiting underground nuclear tests.
- o Delivery of satellite-borne sensors in order to meet treaty verification and other monitoring requirements.
- o Review of approximately 7,000 applications for export licenses for nuclear and nuclear-related materials, equipment and technology to ensure that the exports are consistent with U.S. national security and nuclear nonproliferation policy.
- o Conduct of nuclear weapon technical analyses in support of DOE participation in arms control policy development.
- o Analysis of foreign advanced technologies.

Specific objectives for FY 1985 through 1988 include:

- o Continued delivery of satellite-borne sensors in support of nuclear treaty verification and other monitoring requirements.
- o Maintenance of a technology base capable of responding to new and emerging treaty verification and monitoring requirements.
- o Providing ongoing support to arms control issues affecting DOE areas of responsibility.
- o Reviewing applications for export licenses to ensure that the export of nuclear-related technologies is compatible with overall national security policies.
- o Conducting analyses of foreign technical programs in support of government-wide technological efforts to assess and characterize the technological capabilities of nuclear- and nonnuclear-weapon nations.

The overall goal of the Verification and Control Technology program is to support the development and execution of U.S. national security and foreign policy in the areas of treaty verification, intelligence, arms control, and export control as they relate to nuclear weapons issues. In fulfilling these responsibilities, the program: 1) develops and produces technology to monitor nuclear explosions; 2) controls exports of technology related to the Department of Energy (DOE) areas of responsibility; 3) provides technical and analytical support for the Department's role in nuclear arms control negotiations; and 4) manages DOE's intelligence functions.

	FY 1984 <u>Appropriation</u>	FY 1985 <u>Departmental Request</u>
Operating Expenses - Program Resources...	\$ 63,350	\$ 70,500
Program Direction...	2,750	3,200
Capital Equipment.....	1,750	2,000
Construction.....	0	1,000
	<u>\$ 67,850</u>	<u>\$ 76,700</u>

The increase of \$8,850,000 in operating expenses over FY 1984 is attributable mainly to space detection activities which are necessary to meet increased deliveries of nuclear explosion detection sensors which ride on various satellites. Other increases are needed to satisfy greater requirements for analysis of national security and foreign policy issues relating to nuclear weapons. Additionally, the FY 1985 budget request provides funding for initiation of Project 85-D-171, Space Science Laboratory, in support of satellite fabrication and technology development efforts at Los Alamos National Laboratory, (total estimated cost \$7,500,000).

Verification and Control Technology activities can be divided into two categories, detection technology and analytical support. Detection technology activities develop means of detecting nuclear weapon activities such as nuclear explosions and nuclear material production. Analytical support activities utilize nuclear weapon technical expertise to evaluate arms control proposals, make determinations on export license applications, assess technology transfer issues, and analyze foreign nuclear weapon-related activities. Verification and Control Technology efforts are carefully coordinated with the Departments of Defense (DOD), State (DOS), and Commerce (DOC); the Defense Advanced Research Projects Agency (DARPA); the Central Intelligence Agency (CIA); and the Nuclear Regulatory Commission (NRC).

Detection Technology

In FY 1985 \$50,825,000 is requested for detection technology activities, a \$5,425,000 increase over the FY 1984 level of \$45,400,000.

Detection technology activities are performed in direct response to nuclear treaty verification requirements and other collection requirements. These requirements involve the detection of nuclear explosions conducted underground, in the atmosphere, or in space. To meet this and other requirements, the Verification and Control

Technology program fabricates nuclear explosion detection sensors that ride on the Global Positioning System (GPS) satellites. This satellite system will provide a highly accurate navigational capability for the military, and is scheduled for full deployment in the late 1980's. DOE sensors on the GPS satellites will be able to locate nuclear explosions at or near the earth's surface.

In FY 1985, the Department will be required to deliver satellite sensors for several satellites. The Department must also prepare to meet an equally demanding FY 1986 delivery schedule by ordering long lead-time sensor components.

In addition to conducting the fabrication of sensors, the Verification and Control Technology program also provides, in conjunction with the Air Force, operational support to sensors once they have been delivered. This support includes maintaining the readiness of the sensor after delivery to the spacecraft manufacturer, assisting in analysis of data received, and periodic testing and calibration to ascertain the state of health of deployed sensors.

Supporting the fabrication and operational support portions of the satellite instrumentation program is the space detection base technology effort. The base technology activities are especially important because they generate the scientific challenges necessary to maintain laboratory expertise in the space science area. Specific FY 1985 base technology activities include improvements to satellite sensor longevity, capability, durability, dependability, and technology development efforts to detect a variety of defense activities.

DOE resources are being applied toward design, fabrication, test and evaluation of a free-floating buoy-type marine platform, and associated sensors. DOE also is studying ocean area background radiation and the mechanisms of debris transport to provide data for development of sensor deployment strategies.

The seismic detection effort will be conducted at the FY 1984 level of effort, with DOE continuing to operate its five-station Regional Seismic Test Network (RSTN) in the United States and Canada. This research tool is designed to learn how a similar system might be used to monitor a country's compliance with nuclear testing restrictions through the detection of regional (short range) versus teleseismic (long range) signals. The RSTN supplies seismic data for development of an undertaking of how to distinguish between signals generated by underground nuclear explosions and those generated by earthquakes, mine excavation activities, etc.

An advanced element of the Regional Seismic Program effort is the Cooperative Seismic Array Program being pursued jointly by DOE and DARPA. By arrangement between DARPA and Norwegian authorities, DOE and DARPA will deploy and begin operating an experimental regional seismic array in Norway in 1984. In FY 1985 the array will achieve full operational status and will collect regional seismic data for two to three years. Analysis of this data will determine the value of this technology for verifying treaties limiting underground nuclear tests.

The nonseismic detection efforts (ionospheric and infrasonic monitoring) will continue without any major change in program emphasis. The ionospheric technique uses over-the-horizon radar to monitor disturbances in certain layers of the ionosphere caused by shock waves from an underground nuclear explosion. The infrasonic technique uses microphone arrays for long range monitoring of extremely low frequency sound waves

generated by underground nuclear explosions that propagate in the upper layers of the atmosphere. The aim of these R&D efforts is to determine whether these nonseismic monitoring techniques can be relied upon as supplements to seismic monitoring for verifying a country's compliance with nuclear test treaty limitations. To this end, research efforts focus on developing the capability to determine whether ionospheric and infrasonic signals generated by nuclear explosions can be distinguished from those generated by earthquakes, thunderstorms, missile launches, or other phenomena. Technologies such as these nonseismic efforts could prove extremely valuable treaty monitoring methodologies since they would not have to be deployed within the borders of a country to determine whether it is abiding by nuclear testing constraints.

DOE bears certain responsibilities under the not-yet-ratified Threshold Test Ban Treaty (TTBT) and its companion Peaceful Nuclear Explosions Treaty (PNET). Under the PNET, the U.S. and the Soviet Union would be permitted to conduct observations and examinations on each other's territories for PNE's to make sure that explosions conducted under the treaty's terms do not, in fact, have hidden military benefits. The Verification and Control Technology program is charged with providing the equipment, manpower, expertise, and the full range of capabilities that will permit the U.S. to fulfill this responsibility. The FY 1985 funding request will enable the DOE to maintain the equipment that would be used in the event of overseas deployment. If the TTBT and PNET treaties that have already been signed are ratified, additional resources would be needed to assemble an operational team.

Analytical Support

In FY 1985 \$19,675,000 is requested for analytical support activities, a \$1,725,000 increase over the FY 1984 level of \$17,950,000.

Verification and Control Technology's analytical support activities are conducted through the national laboratories in support of DOE's export control/technology transfer, arms control, weapons, and proliferation responsibilities. These activities provide a factual and analytical base to support U.S. needs in understanding the national security implications of possible test ban treaties, of export license decisions as they relate to proliferation and technology transfer concerns, and of foreign nuclear weapon programs. These activities serve the needs of the DOS, DOD, DOC, ACDA, the NRC and the Intelligence Community, as well as DOE.

The weapons analysis program is aimed at characterizing foreign nuclear activities. The proliferation intelligence program provides assessments of nuclear capabilities of possible proliferant countries. The fulfillment of DOE responsibilities in the arms control and export control/technology transfer areas requires that technical analyses be performed to evaluate various arms control proposals and export control issues. DOE reviews more than 7,000 export control cases each year, many of which require analysis to ensure that the export of certain items is consistent with U.S. national security and foreign policy objectives. This analysis includes the development and refinement of lists of militarily critical technologies to serve as the basis of future export regulations. Analyses are also performed on specific technologies to determine the technology transfer implications of cooperative programs with foreign countries. In the arms control area, DOE provides direct technical support to U.S. delegations at such arms control forums as the U.N. Committee on Disarmament, Test Ban Treaty talks in Geneva, and the U.N. General Assembly Special Session on Disarmament. To support the development of DOE arms control policy positions, extensive analytical activities are conducted in the area of strategic and tactical nuclear weapon systems. The level of effort for these activities will not be substantially changed from FY 1984.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Departmental Request</u>
Program Direction.....	\$ 2,750	\$ 3,200

In FY 1985, \$3,200,000 is requested for program direction, a \$450,000^{a/} increase over FY 1984.

Program Direction funds provide for the salaries, benefits, and travel expenses for 60 FTE's associated with the management and direction of this program at the Headquarters facility located in Washington, D.C. These employees are responsible for technical and analytical program management of field activities, and execution of Headquarters staff functions. More specifically, these duties include:

- o Management and review of technical activities undertaken in response to treaty verification and other monitoring requirements.
- o Review of licenses applications pertaining to the export of nuclear and nuclear-related technologies to assure their dissemination is not contrary to national security interests.
- o Development of DOE policy positions concerning arms control matters related to the nuclear weapon program.
- o Management of the programmatic and staff responsibilities assigned to DOE under Executive Order 12333, "United States Intelligence Activities".

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Departmental Request</u>
Capital Equipment.....	\$ 1,750	\$ 2,000

Capital Equipment expenditures support research, development, test, and production activities through the provision of test equipment and instrumentation related to the total program. FY 1985 reflects an increase of \$250,000 in required funds.

The equipment to be procured will provide new capability to test hardware under fabrication and to conduct experiments designed to validate technology base efforts in various phases of research and development. Most equipment is small-scale bench test equipment such as oscilloscopes, electronic calibration devices, and small scale electronic support devices. Additionally, specialized equipment is needed in the analysis of weapons, proliferation, and export control issues.

^{a/} The increase in Program Direction is based on the upcoming FY 1984 reprogramming action necessary to provide funds for an increased staff ceiling over FY 1983 and to provide for pay raise expenses.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Departmental Request</u>
Construction.....	\$ 0	\$ 1,000

In the late 1980's and beyond, the Verification and Control Technology program is expected to support a record number (more than a doubling) of satellite sensors which will be in fabrication, which will require post-deployment support and which will be in various stages of research and development. The Space Science Laboratory will provide the additional technical capabilities and fabrication and testing capacity necessary to support such a workload. Alternatives to the construction of a new facility such as renovation of existing laboratory space and the addition of overtime work have been examined and are not considered cost effective. These alternatives would require more existing space for renovation than is available, would require significant additions of General Plant Projects and/or operating funds, and could still not provide some of the additional fabrication and testing capacity that would be provided by the proposed project.

Several current, or soon to be undertaken, classified research and development projects of great importance to the nation's security in the 1990's will require the new capabilities and capacities of the Space Science Laboratory. These projects pose significant technical challenges to the scientific staff and often require the development of new technologies before prototype or operational sensors can be deployed. Because existing facilities can barely meet the technical demands of present sensor development and fabrication activities, facility limitations can be expected to have a detrimental effect on the development of new technologies. Present facilities, in addition to impeding sensor development success, are likely to increase the cost of developing these new technologies because sensors would have to undergo manual testing which is very time consuming. In addition to increasing the possibility that DOE would miss a delivery commitment due to longer testing procedures, manual testing also makes it more difficult to meet stringent quality and assurance standards.

Because our sensors ride on satellites as a secondary mission, a missed delivery commitment or failure to meet externally levied performance standards, would not only result in DOE being responsible for inferior satellite coverage, but also would make it much more difficult for DOE to participate in future satellite missions. Another factor which contributes to the importance of this facility is the fact that most satellites on which DOE sensors will ride will be deployed by the Space Shuttle. Unlike satellites that are launched on unmanned vehicles the shuttle-deployed satellites must meet more rigorous quality and testing standards to ensure the safety of the shuttle crew.

The additional capacities and capabilities provided by a new facility will not only enable the program to meet projected delivery commitments, but also improve the productivity of the sensor fabrication, testing, post-deployment, research and development, health and safety, and quality assurance efforts.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Verification and Control Technology

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

1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico	2. Project No. 85-D-171
3. Date A-1 work initiated: 2nd Qtr. FY 1985	5. Previous cost estimate: None
3a. Date physical construction starts: 2nd Qtr. FY 1986	
4. Date construction ends: 4th Qtr. FY 1987	6. Current cost estimate: \$ 7,500
March 1983

7. Financial Schedule:	Fiscal Year	Authorization	Appropriations	Obligations	Costs
	1985	7,500	1,000	1,000	600
	1986	0	5,500	5,500	3,300
	1987	0	1,000	1,000	3,500
	1988	0	0	0	100

8. Brief Physical Description of Project:

This project will provide for new construction of a design, test, and fabrication facility required to accommodate growth programmed by the Office of International Security Affairs (ISA) over the last half of this decade and into the 1990's, primarily in satellite-based test detection activities involving technology development, developmental and prototype instrumentation on satellites and rockets, and operational deployment of instrumentation. This facility will include a three story building of approximately 21,000 sq. ft to accommodate about 40 people. It will contain 11,000 sq. ft, or 52% of the available space, for development laboratories, instrumentation systems fabrication and assembly areas, test and calibration areas, drafting areas, controlled storage, clean areas, a vacuum laboratory, and low-level radioactive source material storage. Offices will occupy 4,000 sq. ft, or 19% of the available space, and 6,000 sq. ft, or 29% of the available space, will be used for computer facilities, a data distribution room, conference area, a library, a machine shop, storage areas, and support facilities (reception areas, halls, restrooms). As planned, the building will use a structural space-frame system of construction with the most cost-effective materials available to allow the maximum open area, flexibility, and future expansion. A minimal-maintenance building envelope will be used for the exterior finish.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project No. 85-D-171

8. Brief Physical Description of Project (cont):

The building will be barrier-free for handicapped persons with an elevator provided for personnel, transport of instrumentation, and building services.

This project conforms to the Laboratory Long-Range Plan.

The site is served by existing utilities. Site work will include the expansion of an existing parking lot, curbs and walkways, landscaping, drainage, and erosion control. Utilities will include sanitary sewer, water, electrical power, high-temperature water, and communications services.

This project is located in an area served by an existing central energy system. The high-temperature water will be converted to a lower pressure and temperature water for space heating and low-pressure steam for humidification.

The energy consumption of this facility will be minimized with energy conservation considerations including insulation, building orientation, earth-sheltered construction, passive solar features, auxiliary air fume hoods, heat recovery, economy-cycle cooling, night and weekend setback/shutdown, and energy efficient electrical and mechanical systems. Energy conservation features and systems will be integrated into the design at the beginning of Title I design in accordance with the General Design Criteria Manual, DOE Notice 6430.

Summer temperature and humidity control will be provided for the computer areas, laboratories, small accelerator lab, and conference rooms by mechanical refrigeration. Evaporative cooling will provide summer temperature control for the drafting areas, offices, and library. Mechanical ventilation will be provided for the machine shop, equipment rooms, and rest rooms. Hoods will be required for some laboratories.

Power will be distributed throughout the building at 120/208Y volts and 277/480Y volts. The building will be equipped with a communications system and an intrusion detection system. Fire protection will be provided by a hydraulically designed wet-pipe sprinkler system. Plumbing and piping systems will consist of heating hot water, potable hot and cold water, industrial hot and cold water, sanitary sewer, roof drain, compressed air, liquid nitrogen, house vacuum, lab vacuum, vacuum pump exhaust, circulating cooling water, and distilled water.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project No. 85-D-171

8. Brief Physical Description of Project (cont):

Standard equipment will include office and laboratory furnishings, machine shop equipment, computer terminals, audio-visual equipment, electronic test equipment, and conference room furnishings. In FY 1985 funding requested provides for engineering and design services.

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

The purpose of the proposed project is to provide the facilities for the development, fabrication, assembly, testing, calibration, quality control, and operations associated with our satellite-related activities in the verification programs.

The verification program consists of three separate areas: satellite-based test detection, ionospheric monitoring, and infrasonic measurements. The satellite activities are by far the largest component and are expected to grow over the next several years. We expect this growth trend to continue with developmental and prototype instrumentation on satellite and rocket flights. The operational satellite program is growing also, with designs now being developed to be used in the programmatic instrumentation deployments on satellites during the last half of this decade and into the early 1990's.

Follow-up operational programs for the 1990's are planned and are now in conceptual development. The rate at which satellite and rocket instruments must be produced, tested, and integrated is scheduled to increase markedly in the next five years. Further, the Space Shuttle will be the launch vehicle for most satellite systems, and, because of the human involvement, testing, quality, and safety issues, must be much more elaborate than in past and current programs.

The project will provide new and expanded facilities, such as space for development laboratories, clean facilities, assembly bays, and modern computer-controlled test and calibration areas, for satellite and rocket instrumentation supporting the verification programs.

The DOE and Laboratory roles in the national verification program are to develop and provide satellite instrumentation and to participate in deployment, operation, and data analysis associated with this instrumentation.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project No. 85-D-171

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

The proposed facility is required to provide the new facilities necessary for performing the mission under evolving national requirements and new state-of-the-art technology.

Present laboratory facilities cannot provide the capacity necessary to support space detection efforts in a manner which will assure that DOE can meet projected delivery commitments in the late 1980's and early 1990's. Additionally, laboratory facilities such as clean space, automated test areas, data-handling facilities, and other resources are insufficient to carry out our verification responsibilities in a manner consistent with technical excellence. Without the project, the Laboratory's participation in cooperative programs will continue to some extent by providing small-scale instrumentation at the rate that has been adequate in the past. However, with the advent of the Space Shuttle and ever increasing requirements for performance and quality, as well as the scheduled increases in instrumentation quantity, we will be unable to fulfill our obligations for long. Without the automated test, calibration, and checkout facilities, the manual methods presently employed will result in incomplete testing and less reliable instrumentation. In summary, the capabilities of the new facility are urgently needed; continuing in an already outmoded operation does not approach the efficiency, testing completeness, quality assurance (QA), and credibility promised by state-of-the-art technology in the new facility.

The greatest urgency stems from the instrument delivery rate and the lack of fabrication and testing space required to support projected commitments. DOE participation in these missions depends on our ability to meet our schedule commitments and to use efficiently the opportunities afforded by the shuttle. Although a crash program to provide the proposed facility is not justified, the planned completion date in 1988 should not be extended.

The project, as conceived, is compatible with neighboring laboratory facilities. Construction of this project in Technical Area 3 (TA-3) near existing Earth and Space Science (ESS) Division facilities will allow possible future expansion of Technical Intelligence Programs. This also complements the potential relocation of related programmatic activities as outlined in the long-range plan.

No special access or relationship to laboratory facilities for handling plutonium, high explosives (HE), other special nuclear materials, or strong radiation sources is required.

The major identified need of the using organization, ESS Division, is for the facility to provide a classified area in which to carry on activities associated with the verification program. These include instrumentation development,

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project No. 85-D-171

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

design, fabrication, assembly, test, calibration, and quality control activities. Because much of the instrumentation will be used in very expensive satellite and space shuttle systems, reliability and safety are emphasized. Qualifying materials, components, and designs, and maintaining traceability of systems delivered for flight are also necessary. Research-quantity radioactive sources and relatively low-level radiation-producing equipment will be used in these activities. The scientific and technical staff occupying the facility require a classified conference room and classified file room.

Development and design studies include instrumentation concepts and approach, physics experiments and measurements to define design parameters, engineering analysis, breadboarding of electronic circuits, prototype construction and evaluation, etc. Physics and electronic developmental laboratories, staff shop, and areas for design, procurement, fabrication, and testing are required for these activities within the organization.

Design interprets all of the above and produces detailed engineering, electronic, mechanical, thermal, and interface designs consistent with quality assurance and safety requirements.

Procurement, while straightforward in concept, can be long and complicated, especially for screened, high-reliability, and military specification components. Acceptance inspection and testing not only determine if procured items meet specifications or procurement acceptance but also provide screening for performance, reliability, and QA. After testing, the items are then admitted to our parts stock and components are qualified for assembly into flight hardware. Controlled storage of components, and subassemblies is necessary for items not immediately inserted into the fabrication activity. Both environment and access controls are required for many items.

Fabrication and assembly is a major activity extending from the construction of small subassemblies to complete payload packages. Facilities for preparing components, as well as clean space for the assembly work, are required. In some cases, for certain materials and sensitive components, a controlled environment for temperature, humidity, and gas may be required.

Functional tests are carried out at many assembly stages and are repeated during operations with the full instrument assembly during handling and storage periods. These are normally performed at ambient conditions and are intended as a check on the "liveness" of the instrumentation.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project No. 85-D-171

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

Environmental tests are performed to ensure the instrumentation survival and performance in specification over a range of environmental conditions that includes the range expected in storage, shipping, integration, launch, and operational phases. Vacuum, thermal, and thermal vacuum tests will be carried out in the proposed facility, whereas vibration and shock tests will normally be performed elsewhere.

Calibrations are required to measure the instrumentation sensitivity to radiations for which the instrumentation is intended, and appropriately, to interfering stimuli to which the instrumentation may be exposed. Generally, in space we are attempting to measure x rays, gamma rays, neutrons, charged particles, and other signals in a mixed background. Radioactive sources, small accelerators, and other equipment, are required to perform the calibration tests.

After instrumentation has been partially or fully assembled, it may be stored for some period before further work or delivery is scheduled. Again, both access and environmentally controlled storage space is required. Physically, the areas may be combined with the component storage areas already described; however, storage details and control procedures may be different.

When instrumentation packages are scheduled for delivery to another facility, whether to Sandia Laboratories, to a military spacecraft contractor, to NASA, or to a field station where we are carrying out experiments, a final inspection and a functional test are usually required to confirm that the material is in proper condition for delivery. Delivered items will range from modules or subassemblies to complete payload assemblies comprising several complete instruments. Some of these will be for integration into additional payload, rocket, or satellite systems; some will be for repair, modification, or retrofit of systems already delivered, and some will be complete operating systems. In any case, predelivery activities must ensure that all appropriate requirements have been met, and that the material is flight ready or ready for deployment.

The actual instrumentation delivery must maintain the quality, performance, calibrations, and overall integrity of the items with mechanical, thermal, and other environmental protection as required. We use special shipping cases and materials, as appropriate. Space is required for preparing and packaging items, for delivery and also for storing the shipping cases when they are not in use.

Field operations, as the term implies, are those activities carried out away from Los Alamos. For certain operations, space in the proposed facility for additional functions is required to support those operations. Operations feed data or questions back to Los Alamos for operational analysis and further interactions. Laboratory tests, instrument modification, repair, and design change evaluations all result from field operations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project No. 85-D-171

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

More in-depth data analysis and programmatic data interpretation require use of both our distribution processor and the Central Computing Facility (CCF). A computer terminal room and appropriate data file are required in the Space Science Laboratory. Actual distributed processor facilities are to be located in another building.

Modern state-of-the-art methods are essential to the quality and cost efficiency required by our programs. Computer-automated test and evaluation capabilities will achieve the utmost from our testing, calibration, and other appropriate functions. The proposed facility is strongly oriented toward providing the instrumentation space and equipment required to meet our responsibilities.

No unusual design or construction requirements are anticipated.

10. Details of Cost Estimate: a/

a. Engineering, design, and inspection at about 16% of construction costs, Item b..... \$ 700

b. Construction costs 4,425

- (1) Improvements to land including grading, paving, curbs and sidewalks, erosion control, and landscaping..... \$ 95
- (2) Laboratory-office building 21,000 sq. ft at approximately \$187 sq. ft 3,930
- (3) Other structures..... 0
- (4) Special facilities..... 0
- (5) Utilities includes sanitary sewer, water, electrical power, high-temperature water and communications services..... 400

c. Standard equipment includes office furniture, laboratory furnishings machine shop equipment, computer terminals, audio-visual equipment, electronic test equipment, and conference room furnishings..... 1,110

Subtotal..... \$ 6,235

d. Contingencies at approximately 20% of above costs..... 1,265

Total project cost..... \$ 7,500

a/ Based on completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project No. 85-D-171

11. Method of Performance:

Design and inspection of the facility will be performed under a negotiated architect-engineer contract. Fixed-price contracts and subcontracts will be awarded for construction and procurement on the basis of competitive bids.

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

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	Total
a. Total project funding						
(1) Total facility costs						
(a) Construction line items	\$ 0	\$ 600	\$ 3,300	\$ 3,500	\$ 100	\$ 7,500
(b) PE&D.....	0	0	0	0	0	0
(c) Expense funded equipments.....	0	0	0	0	0	0
(d) Inventories.....	0	0	0	0	0	0
Total facility costs.....	0	\$ 600	\$ 3,300	\$ 3,500	\$ 100	\$ 7,500
(2) Other project funding						
(a) Conceptual design.....	\$ 100	\$ 0	\$ 0	\$ 0	\$ 0	\$ 100
(b) Other project-related costs.....	0	0	0	0	0	0
Total other project funding.....	\$ 100	\$ 0	\$ 0	\$ 0	\$ 0	\$ 100
Total project funding.....	\$ 100	\$ 600	\$ 3,300	\$ 3,500	\$ 100	\$ 7,600
(Items 1 and 2)						
b. Total related funding requirements (estimated life of project: 25 years)						
(1) Facility operating costs.....					\$ 217	
(2) Programmatic operating expenses directly related to the facility.....					7,779	
(3) Capital equipment not related to construction but related to the programmatic effort in the facility.....					480	
(4) GPP or other construction related to programmatic effort in the facility.....					1,000	
(5) Other costs.....					0	
Total other related annual funding requirements.....					\$ 9,476	

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CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project No. 85-D-171

13. Narrative Explanations of Total Project Funding and Other Related Requirements (cont):

(2) Programmatic operating expenses directly related to the facility

This cost figure was obtained by assuming 40 ESS-Division full-time equivalents (FTE's) to operate the facility in 1988. The total cost for these FTE's in 1982 was \$5,133,000. Escalated through 1988 at an annual rate of 5%/year yields a cost of approximately \$7,779,000 for 40 FTE's in 1988.

(3) Capital Equipment not related to construction but related to the programmatic effort in the facility consists of office furniture, laboratory furniture, machine shop equipment, computer terminals, electronic test equipment, conference room furnishings, and audio-visual equipment. Approximately \$480,000 per year is anticipated.

(4) GPP funding for development laboratory space will be required to sustain the programmatic expansion until the facility comes on line and thereafter.

(5) Other costs are not anticipated.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Space Science Laboratory,
Los Alamos, New Mexico

2. Project No. 85-D-171

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

a. Total project funding

(1) Total facility

- (a) Construction line item. No narrative required.
- (b) PE&D is not requested.
- (c) No expense-funded equipment is anticipated for this project.
- (d) None will be required.

(2) Other project funding

- (a) Conceptual design costs. No R & D will be required.
- (b) No other project-related funding is anticipated.

b. Total related funding requirements

This facility will be used for its programmatic purpose for 25 years.

(1) Facility operating costs

This category includes maintenance, janitorial, and utilities calculated from FY 1982 costs on a per square foot basis throughout the Laboratory and projected to FY 1988.

An escalation of 5%/year was used on maintenance and janitorial base costs and for utilities. This procedure yields an FY 1988 maintenance cost of \$2.57/sq. ft, a janitorial cost of \$2.10/sq. ft, and a utilities cost of \$5.67/sq. ft for a total of \$10.34/sq. ft/yr. The product of \$10.34 and 21,000 (the area of the building) is approximately \$217,000.

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DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

LEAD TABLE

Materials Production

Atomic Energy Defense Activities

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

	<u>FY 1983 Appropriation</u>	<u>FY 1984 Appropriation</u>	<u>FY 1985 Base</u>	<u>FY 1985 Request</u>
<u>Materials Production (DP)</u>				
Operating Expenses				
Reactor Operations	\$ 331,000	\$ 484,245	\$ 484,245	\$ 557,235
Processing of Nuclear Materials	257,650 ^{a/}	347,595	347,595	412,770
Supporting Services	228,299 ^{b/}	207,960	258,460 ^{c/}	257,985
Uranium Enriching	109,000	140,000	140,000	245,300
Program Direction	14,000	17,500	17,900 ^{d/}	20,300
Subtotal Operating Expenses	\$ 939,949	\$1,197,300	\$1,248,200 ^{c/}	\$1,493,590
Capital Equipment	\$ 102,300 ^{b/}	\$ 98,500	\$ 98,500	\$ 128,660
Construction	\$ 277,650	\$ 240,100	\$ 275,400 ^{c/}	\$ 241,950
Total Materials Production	\$1,319,899	\$1,535,900	\$1,622,100	\$1,864,200
Total FTE's	311	331	331	336

Authorization: Section 31, P.L. 83-703

^{a/} Includes comparability adjustment of \$3,700,000 in FY 1983 for operation of the plutonium oxide conversion line at Los Alamos National Laboratory previously funded in the Energy Supply, Research and Development Appropriation.

^{b/} Includes comparability adjustment of \$8,039,000 operating expenses and \$100,000 capital equipment in FY 1983 for development activities on the plasma separation process previously funded in the Uranium Enrichment appropriation.

^{c/} Assumes approval of an \$85,800,000 FY 1984 Supplemental for security activities at Idaho and Savannah River, environmental activities at Savannah River, and a weapons support project at Oak Ridge.

^{d/} Includes additional funding for Federal pay cost requirements and other related expenses.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF CHANGES
Materials Production
(in thousands of dollars)

FY 1984 appropriation enacted.....	\$1,535,900
Built-in increases and decreases:	
Increase for Federal pay cost requirements and other related expenses ...	+ 400
Additional funding identified in a proposed FY 1984 supplemental for environmental and security activities	+ 85,800
FY 1985 Base	\$1,622,100
Program increases and decreases:	
<u>Base Activities</u>	
Increase for escalation impact on base operating expenses and capital equipment	+ 57,070
Increase at Richland to complete installation of a new magnetic filter in the reactor primary cooling system and for N Reactor life extension studies	+ 8,500
Increase in reactor operations at Savannah River for training, construction project liaison, manpower, and increased reactor innage	+ 2,500
Increase in reactor operations at Savannah River, Oak Ridge, and Richland for increased production and maintenance activities	+ 9,255
Decrease in reactor operations and processing at Savannah River to reflect the savings realized by the shutdown of auxiliary steam plants at Savannah River due to the completion of Project 81-D-142, Steam Transfer Headers, in FY 1985	- 1,500
Increase in processing at Albuquerque, Oak Ridge and San Francisco for non-specification nuclear material recovery and for preparation of plutonium oxide for test reactors	+ 3,575
Increase in processing at Idaho to support startup of the Fluorinel Dissolution and Storage Facility (Project 77-13-A) and the Remote Analytical Facility (Project 81-D-131)	+ 14,690
Increase in processing at Savannah River for decontamination, dismantlement and disposal of the obsolete Pu-238 facility	+ 4,500
Increase in processing activities at Richland and Savannah River for training, maintenance, manpower and quality assurance to handle the increased load of nuclear fuels and targets to meet weapons requirements	+ 18,616
Increase in supporting services for continuation of the test isotope production program at Los Alamos National Laboratory	+ 15,000
Increase in supporting services at various locations primarily for additional spare parts, common use stores inventories, weapons support, solidification of Uranium-233, process development, conceptual engineering, etc.	+ 16,380

SUMMARY OF CHANGES
Materials Production
(continued)

Increase in Program Direction to support 336 full-time equivalents at Headquarters (57) and at Savannah River (279)	+ 2,400
Increase in capital equipment at various locations	+ 6,080
Decrease in funding prior year projects at various locations	- 19,516
Increase to initiate two construction projects at the Savannah River fuel fabrication area to improve operations, reduce costs, and to eliminate shipments of liquid uranyl nitrate solutions between Oak Ridge and Savannah River (Projects 85-D-142 and 85-D-145)	+ 9,800
<u>Initiatives</u>	
Decrease in Facility Restoration program, which is in the fifth year of a six year funding schedule	- 23,130
Decrease in reactor safety and reliability improvements program and associated support activities due to the completion of several subprojects within the reactor safety project (32-D-126)	- 990
Net decrease in security activities due to the acceleration of three essential security projects with supplemental funding in FY 1984	- 5,240
Increase in operating expenses and capital equipment for the first full year of operation of the PUREX fuel processing plant at Richland and processing the resulting plutonium oxide product to metal at Los Alamos National Laboratory for weapons applications	+ 2,090
Decrease in funding for support of Special Isotope Separation research and development program	- 32,900
Increase in Idaho Fuel Processing Facility Restoration activity to initiate a design-only project enabling the IFPF to continue naval fuel processing operations into the 1990's (Project 85-D-139)	+ 8,600
Increase to complete funding of tritium production research and development	+ 9,100
Decrease in funding in support of a one year deferral for the Process Facility Modifications project at Richland (Project 84-D-135)	- 12,500
Increase for support of the high productivity reactor core (Mark 15) conversion at Savannah River and for completion of the slightly-enriched fuel storage project (Project 83-D-180)	+ 19,020
Increase for continuation of fuel cycle improvements research and development at Savannah River and San Francisco	+ 14,400
Increase in reactor operations at Richland to provide productivity improvements to maximize N Reactor output and minimize reactor downtime	+ 5,000
Increase for separative work requirements for N Reactor and Mark 15 fuel .	+ 104,300
Increase for Naval Reactor Program separative work requirements	+ 1,000
Increase to initiate a productivity retention project at the Feed Materials Production Center, Fernald	+ 6,000
FY 1985 Request	\$1,864,200

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
Materials Production

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

Program Overview

The Materials Production program provides nuclear materials to meet near-term national defense and non-defense requirements. In addition, Materials Production sustains a base production program capable of meeting long-term nuclear materials production requirements consistent with the annual Presidential Nuclear Weapons Stockpile Memorandum and the annual Department of Energy Materials Management Plan.

The specific objectives of the Materials Production Program are:

- o Provide nuclear materials for National Defense requirements and for allies under mutual defense agreements;
- o Provide nuclear materials for departmental reactor research and development programs, other government agencies, industry, and foreign governments under civilian agreements for international cooperation;
- o Receive and process non-production reactor fuels (e.g., Naval propulsion reactors, research reactors, materials testing reactors, etc.) for recovery of plutonium, enriched uranium, and other materials;
- o Make available sufficient N Reactor by-product steam to the Washington Public Power Supply System to generate electricity for the Bonneville Power Administration power grid;
- o Recycle nonspecification nuclear materials to recover valuable materials, minimize storage costs, and conserve materials and energy;
- o Maintain production facilities operational capability to meet nuclear material needs;
- o Conduct all nuclear materials production related activities in a safe, secure, environmentally-acceptable, energy-efficient and cost-effective manner and in accordance with Departmental environmental protection, safety, health protection and quality assurance Orders and Directives;
- o Maintain technical capability to develop process improvements and improved production operations technology; and
- o Evaluate and develop new and replacement production and separation facilities to meet long-term materials production requirements.

The FY 1985 budget request has been reduced by \$4,900,000 for savings resulting from management initiatives in administrative organization management, administrative systems and processes, payroll/personnel, procurement reform, printing and publications and travel management.

Production Operations

To meet these objectives the Materials Production program operates a reactor feed material production complex, production reactors at Savannah River and Richland, spent fuel chemical processing plants at Savannah River, Richland, and Idaho, research and development efforts on long-range alternatives for production of nuclear materials, and support facilities integral to the operation of the facilities mentioned above. These facilities are unique to the production of nuclear materials for defense purposes. There is no cost effective alternative production method within the U.S., at present or within the production planning period, for providing the nuclear materials required by the national defense program, other Federal programs, and industry.

Highly-enriched uranium is recovered from spent Naval and research reactor fuels at Idaho and shipped to the Oak Ridge Y-12 Plant. This material is mixed with either virgin enriched uranium from the enrichment plants or uranium recovered at Savannah River from spent production or research reactor fuels. This enriched uranium is then shipped to Savannah River where it is alloyed with aluminum and fabricated into fuel tubes for subsequent reactor charging with enriched lithium targets for tritium production or depleted uranium targets for plutonium production. The irradiated enriched uranium fuel is processed at the chemical processing plant at Savannah River for recovery and recycle of the remaining enriched uranium.

At Fernald, Ohio, depleted uranium is processed into metallic uranium and cast into cylinders. These castings are shipped to Ashtabula, Ohio, for extrusion and machining to form target cores. The depleted uranium cores are shipped to Savannah River, clad with aluminum and prepared for loading into the Savannah River reactors. In FY 1985 slightly-enriched uranium will also be produced at the feed material facilities for the conversion of the Savannah River reactors to a homogeneous (slightly-enriched) uranium core loading. After irradiation within the reactor, targets are stored temporarily in onsite facilities prior to being processed in the chemical processing plant at Savannah River to recover the plutonium for weapon use. Other reactor products used for defense, research, medical and commercial applications are also recovered during the processing operation.

The N Reactor at Richland uses slightly-enriched uranium fuel to power the reactor and to simultaneously produce plutonium. To obtain fuel for the Richland reactor, the slightly-enriched uranium is converted to metal and cast into ingots at the Fernald, Ohio plant, extruded into cylindrical billets at Ashtabula, Ohio, and shipped to the fuel fabrication facilities at Richland, Washington. The billets are then simultaneously extruded and clad with zirconium to provide finished fuel elements for the reactor. After irradiation within the reactor, the spent fuel is removed and temporarily stored onsite prior to being processed in the Richland PUREX fuel processing plant. PUREX (an acronym for Plutonium-Uranium Extraction process) will be in its first full year of operation in FY 1985 after being in standby from 1972 to November 1983. Spent fuel from N Reactor has been stored since PUREX was placed in standby.

The Savannah River processing plants will be operating at high capacity to process the increased load of nuclear fuel and targets for recovery of plutonium from P, K and L Reactors and tritium from C Reactor for meeting weapon requirements.

Spent reactor fuel from the naval reactors program and research reactors is processed at the Idaho Fuel Processing Facility within the Idaho National Engineering Laboratory at Idaho Falls, Idaho. The fuel storage portion of the Fluorine Dissolution Process and Fuel Storage Facility at Idaho will become operational in FY 1984; the head-end fuel processing and dissolution portion will become operational in FY 1985. The only source of krypton-85 in the free world is as a byproduct from the Idaho fuel processing activities.

Nonspecification nuclear material and nonproduction reactor fuels are processed at Los Alamos, New Mexico; Oak Ridge, Tennessee; and Santa Susana, California.

Materials Production is performing research and development on isotope separation technology using lasers. The principal benefit of such a technology will be to augment the weapon-grade plutonium stockpile. The Lawrence Livermore National Laboratory is developing the Atomic Vapor Laser Isotope Separation process with a full-scale process demonstration scheduled by FY 1987.

Security Support

At the Savannah River Plant this activity provides for an independent contractor, Wackenhut Services, Inc., to provide, operate, and maintain an armed and uniformed protective force for the physical protection of Department of Energy security interests and other related duties. Protection security services are presently being provided by the operating contractor, E. I. du Pont de Nemours and Co. (DuPont); the new contractor will replace DuPont for security only and will furnish all required security services. The decision to seek a new contractor for security services has been brought about by the increasing specialization of security functions.

The security support services provided by the new contractor will include the following major duties: controlling access to the Savannah River Plant general site area; performing security patrols on the site; protecting secure areas, such as reactor facilities and special nuclear material areas, against unauthorized access; staffing fixed patrol posts; escorting personnel and materials; checking secure repositories; apprehending unauthorized persons or vehicles in secure areas; protecting special nuclear material; preventing access to security areas or to classified material, theft of Special Nuclear Materials, or sabotage of vital facilities through use of force, if necessary; staffing alarm stations; developing and implementing security plans and procedures; and providing appropriate administrative support services, including personnel management, budgeting, and accounting.

In addition to the activities at Savannah River, additional improvements of the security and safeguards programs at Idaho and Richland are planned.

Environmental Support

The FY 1985 request includes funding to continue the following environmental activities at the Savannah River Plant: (1) the elimination of hazardous industrial waste discharges to ground and surface waters, (2) the cleanup of ground water contamination, (3) the deactivation of seepage basins, and (4) reactor thermal discharge and mitigation evaluations. In order to accomplish these objectives the requested funding is required to conduct planned evaluations and define and undertake mitigation activities.

The activities to be funded will include expanded, comprehensive ongoing studies of the environmental effects of Savannah River Plant cooling water withdrawals and discharge, the significance of effluent cooling water impacts on the environment, and evaluation of alternative cooling methodologies. Conceptual designs for facilities to cool reactor cooling water effluents will also be evaluated.

In order to eliminate future problems, a system for the recovery of uranium and treatment of process effluents will be installed in the fuel fabrication area of the plant. This system will allow discharges in accordance with National Pollutant Discharge Elimination System permit limits.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Base</u>	<u>FY 1985 Request</u>
<u>Materials Production</u>	\$1,539,000	\$1,622,100	\$1,864,200

The requested level for FY 1985 supports a program which will meet near-term national defense and non-defense nuclear materials requirements through FY 1986.

Actions initiated in previous years to increase production will be continued in FY 1985 including: N Reactor operation to produce weapon-grade plutonium, PUREX fuel processing operation, operation of Savannah River reactors to produce high-purity (3% Pu-240) plutonium for blending, the restoration program, and lastly, a program to convert selected Savannah River production reactors to a homogeneous (Mark 15) core that is capable of substantially increasing plutonium production.

I. <u>Operating Expenses</u>	\$1,197,300	\$1,248,200	\$1,493,590
A. <u>Reactor Operations</u>	\$ 484,245	\$ 484,245	\$ 557,235

The FY 1985 request for reactor operating expenses provides for necessary operation of production reactor feed plants at Fernald and Ashtabula, Ohio, and Oak Ridge, Tennessee; the N Reactor, fuel fabrication and support facilities at Richland, Washington; and four production reactors (P, K, C, and L), fuel fabrication and support facilities at Savannah River, South Carolina.

Oak Ridge

In both FY 1984 and FY 1985, slightly-enriched uranium billets will be produced for the Richland N Reactor to support the weapon-grade plutonium production mode. Complete conversion of the Savannah River reactors to a Mark 15 slightly-enriched uranium loading will occur by the end of FY 1987. Therefore, the Fernald, Ohio, Feed Materials Production Center and the Ashtabula, Ohio, Extrusion Plant will produce depleted uranium cores and slightly-enriched uranium cores for the Savannah River reactors in FY 1985. This production is necessary to support reactor operations at Savannah River and to continue to establish a preproduced inventory pipeline so that one Savannah River reactor can be converted to Mark 15 loading to produce high-purity plutonium beginning in late FY 1986 and the rest (except for those needed to meet tritium requirements) in FY 1987.

In FY 1985, a productivity retention program will be initiated with a project at the Fernald, Ohio, Feed Materials Production Center needed to ensure the long-term safe, reliable, and efficient operation of the nuclear materials production and processing facilities.

At the Oak Ridge, Tennessee, Y-12 Plant highly-enriched uranium from non-production fuels processed at the Idaho Fuel Processing Facility and highly-enriched uranium from production fuels processed at Savannah River will be converted to metal form for reuse as fuel in the Savannah River production reactors and for use in the weapons program. This recycle of recovered highly-enriched uranium conserves virgin highly-enriched uranium recovered from recycled weapons and held in DOE material inventories. Highly-enriched uranium metal will be shipped to Savannah River to support operation of the Savannah River reactors on Mark 16/31 (plutonium production) and Mark 22 (tritium production) loadings.

An additional \$5,130,000 is needed in FY 1985 at Oak Ridge to support these activities.

Richland

The Richland N Reactor will continue to produce weapon-grade (6% Pu-240) plutonium in FY 1985. N Reactor will produce weapon-grade plutonium and the facility will also deliver sufficient by-product steam to the Washington Public Power Supply System to generate about 3.8 billion kilowatt-hours of electricity for the Bonneville Power Administration power grid, resulting in about \$57,000,000 in steam revenues. This is an increase of \$1,200,000 above the estimated FY 1984 revenues and results from the escalation clause in the renegotiated steam revenues contract. To support N Reactor operations, the fuel fabrication facility will produce finished fuel. An additional \$14,710,000 is included for N Reactor weapon-grade production support.

Richland will continue the productivity improvements program to maintain the reactor at current state-of-the-art technology levels and to meet stricter safety and environmental requirements. An increase of \$2,800,000 in operating expenses is included for the productivity improvements program.

Funding of \$3,500,000 is included for N Reactor to improve the reactor on-line operating efficiency and for studies to evaluate methods for extending the reactor operating life beyond the early 1990's. Funds are also provided in the amount of \$5,000,000 for installation of a new magnetic filter in the reactor primary cooling system to keep the system cleaner and free of induced radioactive paramagnetic material. This will reduce radioactivity levels in the water and effect substantial personnel exposure reductions during fuel change, repair, maintenance and modification operations. The magnetic filter system should provide savings of over \$1,000,000 per year from reduction of personnel exposures during such operations and maintenance efficiencies and more than pay back the cost of the installation.

Operating expense funding for the production reactor safety improvement program initiated in FY 1981 will increase at Richland by \$1,172,000 to support the reactor simulator effort needed to train new and existing contractor employees on reactor operation in real life situation simulations.

Savannah River

At Savannah River, reactor operations consist of all activities directly attributable to the production of nuclear materials in a reactor. The four reactors (P, K, C, and L) will produce weapon-grade plutonium and tritium for the nuclear weapons program, plutonium-238 for both weapons and space applications, and other nuclides for medical and industrial requirements. Within reactor operations, major activities include fuel and target fabrication, irradiation, and reactor safety.

The fuel fabrication facilities produce all the fuel and target elements needed for the Savannah River reactors. Raw materials such as lithium, depleted uranium, enriched uranium, neptunium oxide, and aluminum go through various metal working operations such as casting, machining, plating, extrusion, and welding as well as inspection operations to produce fuel and target elements for the reactors. Nearly a quarter of a million slugs, housings, control rods, fuel tubes and target tubes are produced annually by approximately 300 employees. In FY 1985, these facilities will produce fuel and target elements in support of tritium and plutonium production in the reactors. This budget request supports all costs (material, labor, and overhead) associated with operating and maintaining these facilities.

Preproduction of Mark 15 cores will begin late in FY 1985 so that one reactor can be operating on Mark 15 cores by late FY 1986 and two others can be operating on Mark 15 cores by late FY 1987. The Mark 15 program has the potential for significant near-term increases in the level of plutonium production. In addition, the Mark 15 uniform lattice offers several safety advantages over the current Mark 16/31 mixed lattice. An increase of \$5,520,000 is requested to preproduce slightly-enriched uranium slugs.

The fuel and target elements shipped to the reactor areas are irradiated in the four operating reactors to produce weapon-grade plutonium, tritium, Pu-238 and other nuclides. These facilities are also responsible for final assembly of fuel, target, and control rod elements prior to irradiation, for storage of the highly radioactive fuel and target assemblies following irradiation, and disassembly/bundling of tubes and slugs in preparation for shipment to the separation areas for processing. Approximately 750 employees are involved in the operation and maintenance of these facilities.

It is projected that one reactor will be operating on tritium charges and three reactors on plutonium charges during FY 1985. The Mark 31 plutonium assemblies discharged will contain a nominal Pu-240 content of 3% to support the blending program. Irradiation of Mark 42 assemblies to produce high Pu-242 material will continue and Mark 53 assemblies will be irradiated as necessary to produce Pu-238 for defense and research purposes. The operating philosophy is that tritium producing charges will be used as necessary to meet tritium requirements with the balance of the capacity allocated to plutonium production.

The budget request includes an additional \$26,900,000 to operate and maintain the reactor facilities. Programmatic increases include funding to man new safeguards equipment, maintenance, construction project liaison personnel and manpower training, increased reactor innage and contractual commitments made in FY 1983 to phase fund required adjustments to the contractor personnel benefits program.

The reactor safety and reliability program encompasses activities identified in various safety assessments subsequent to the Three Mile Island (TMI) accident. These include training of reactor operator and supervisory personnel, operating reactor simulators, reactor coolant instrumentation and computerization, nondestructive testing of reactor internals, engineering safety studies, and studies of ways the Department can profit from the lessons the TMI accident taught the nuclear industry. The FY 1985 operating expense increase of \$1,040,000 supports increased reactor operator and supervisor training, additional personnel for writing procedures to support the simulator, and additional engineering development of the reactor training simulator.

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Base</u>	<u>FY 1985</u> <u>Request</u>
B. <u>Processing of Nuclear Materials ..</u>	\$ 347,595	\$ 347,595	\$ 412,770

For materials processing, the FY 1985 request provides funds to support the increasing level of new activities necessary to supply increased quantities of plutonium and tritium for weapons and R&D programs to meet increased nuclear materials defense requirements. Nuclear materials processing activities are carried out at Savannah River, South Carolina; Richland, Washington; Idaho Falls, Idaho; Oak Ridge, Tennessee; Los Alamos, New Mexico; and Livermore and Santa Susana, California. The major increase in funding is for the first full year of PUREX fuel processing at Richland, Washington.

Idaho

The principal missions in FY 1985 for the Idaho Fuel Processing Facility continue to be the receipt and interim storage of spent nuclear fuels from the Naval propulsion program and research and development reactors, chemical processing and recovery of the highly-enriched uranium from these fuels for subsequent return to the nuclear materials production cycle, recovery of radioactive krypton-85 to support defense requirements and the development of appropriate technology for future processing needs. The existing aluminum fuel dissolution headend will operate to process uranium-235 and the krypton recovery system will significantly increase processing of the offgas from the operation to recover krypton-85.

To accomplish these missions, a large, skilled manpower resource is required not only for the operation of these facilities, but also for technical, engineering, maintenance, safety, quality assurance, and analytical activities. The FY 1985 request is necessary to assure accomplishment of all identified goals, and includes \$9,332,000 in additional funding for these activities.

In FY 1984, initial operation of a major new fuel storage facility provided under the Fluorinel Dissolution Process and Fuel Storage Facility project (FAST, 77-13-a) will begin. The new FAST fuel storage basin will be brought into full operating status in FY 1985 and the required operating and support staffs for this facility will be provided. Although the FAST fuel storage facility will become the principal fuel receipt and storage facility for Naval propulsion fuels, spent fuels from a number of research and development reactors and the graphite matrix fuels from the Ft. St. Vrain High Temperature Gas Reactor will continue to be stored in the original CPP-603 fuel storage area.

A major new fuel processing headend facility also provided by the FAST Project is scheduled for hot startup and initial operation during FY 1985. The FAST dissolution headend will become the primary Idaho headend processing facility with occasional headend processing in the old CPP-601 process building as required.

Uranium-bearing dissolver solutions from the FAST headend will be processed through existing solvent extraction and uranium denitration systems. Uranium-235 will be processed through the headend in FY 1985. For full operation of FAST in FY 1985, an additional \$6,500,000 is needed to provide additional manpower for the dissolution headend process, fuel receipt and storage.

The amount of spent fuel from the Naval Reactors program to be returned to the Idaho Fuel Processing Facility by 1992 is scheduled to increase significantly above current processing rates. The Fuels Processing Restoration project (85-D-139) is required to return reliability and capacity to a level sufficient to process the scheduled returned fuels. The highly enriched uranium processed from the returned Naval fuels is required as feed for the driver fuels for the Savannah River production reactors.

In support of Idaho restoration activities, the budget request provides materials evaluation and fabrication review; pilot-plant design verification; process and equipment design to minimize high and intermediate level waste generation; design evaluation for radioactivity monitoring systems, remote systems, data acquisition and process control systems; and in line monitoring for safeguards; conceptual and Title I and II design reviews and corrosion studies to assure equipment compatibility with new product dissolver composition. Of the request, an increase of \$2,900,000 is for this effort, with a decrease of funding in supporting services.

The Idaho Fuel Processing Facility support systems, e.g., steam plant, utilities, maintenance, heating and ventilation, will continue operations at the required levels. The new steam generating plant provided under the Coal-Fired Steam Generation Facility project (80-AE-3) will initiate operations in FY 1984 and will be brought up to its full operating personnel complement in FY 1985. An additional \$500,000 is included in the FY 1985 budget for the last increment of staffing required to operate this facility.

The request also provides for activities necessary to assure both continued near-term and long-term processing capabilities at the Idaho Fuel Processing Facility.

Richland

Fuel processing activities at Richland will increase significantly in FY 1985 since it will be the first full year of processing for the reactivated PUREX plant. The fuel to be processed contains both weapon-grade and fuel-grade plutonium. The weapon-grade plutonium oxide product from PUREX will be converted to the required metal at Los Alamos facilities. Fuel-grade plutonium oxide from PUREX will be shipped to Savannah River, dissolved, and blended with high-purity plutonium, and then converted to metal. The amount of fuel processed in FY 1985 will be higher than in FY 1984 because PUREX will operate all of FY 1985 compared to less than a full year at a lower throughput in FY 1984. Of the FY 1985 requested increase, \$27,835,000 is attributable to the transfer of funding for PUREX from supporting services to processing activities.

Nonspecification plutonium recovery will continue in the Plutonium Finishing Plant. Three principal activities are involved: (1) processing material containing plutonium to produce a purified plutonium nitrate solution; (2) converting the nitrate solution to an oxide product; and (3) terminal cleanout of space and equipment no longer required to support operations. Processing of all the recoverable nonspecification plutonium now available is expected to be completed in FY 1985, thus allowing use of the plant to process non-specification plutonium from other DOE sites.

Terminal cleanout of Richland facilities now used for storage of nonspecification nuclear material will be continued. Return of nonspecification plutonium to production use will help to meet plutonium requirements for defense programs; reduce the facility space required for storage; decrease the cost of storage; and improve the safety and security of storage activities. To illustrate the improved safety and security environment resulting from nonspecification material processing, it is expected that during FY 1985 all plutonium now stored in an existing building can be removed for processing, thus freeing the building for other activities. By removing the plutonium from this building, security improvements that would cost \$10,000,000 can be avoided. Material processing and terminal cleanout funding will decrease by about \$1,685,000.

Savannah River

After irradiation in the Savannah River production reactors, the spent fuel and targets are processed in the chemical separations plants. There is approximately a six month cooling period between fuel discharge from reactor operations output and fuel processing.

The chemical separation processes provide plutonium, tritium, and other materials for use in defense programs, research and development, and commercial sales. The enriched uranium recovered from spent fuel is sent to Oak Ridge for recycle to be blended with additional enriched uranium for fabrication into new reactor fuel. The chemical separations plants will process the output of one reactor operating on tritium charges and the other reactors on plutonium charges during FY 1985. Pu-238, Pu-239, tritium, and other isotopes are used in defense programs. Pu-238, tritium, and other isotopes are used in government research and development programs as well as in the private sector.

During FY 1985, fuel-grade plutonium produced by the PUREX facility at Richland will be blended with high-purity plutonium produced at Savannah River to produce weapon-grade plutonium to meet Nuclear Weapons Stockpile Memorandum requirements. Because blending utilizes fuel-grade plutonium that would otherwise be unusable in weapons, blending is a very cost-effective method of increasing the supply of weapon-grade plutonium. Tritium demand will be met by a combination of new production and repurification of partially decayed material. A funding increase of \$23,282,000 is needed to provide for the additional workload of processing fuel and targets to provide plutonium and tritium for meeting weapons requirements, the processing of non-radioactive hazardous waste disposal, and the increased maintenance, training, manpower and quality assurance necessary to support the higher workloads.

In FY 1985 an increase of \$4,500,000 is needed to continue the effort to dismantle obsolete and deteriorated Pu-238 process facilities to make the space available for high priority activities. These facilities are located in the H chemical processing plant. Dismantlement will reduce substantially the risk of an interruption in the operation of the H chemical processing plant due to a potential fire or accidental radioactive contamination. About 2 kilograms of Pu-238, valued at approximately \$4,000,000, will be recovered during the facility dismantlement.

The recovery and subsequent utilization of Pu-239 and Pu-238 from nonspecification plutonium is an extremely cost-effective method by which the Department fulfills its nuclear material requirements as contrasted to new production expenses. To assure that this activity receives proper management attention and is conducted in an expeditious mode, a Central Scrap Management Office is in existence at the Savannah River Operations Office. This activity, utilizing a computerized data base, is a significant improvement from previous manual systems and is providing improved management effectiveness.

Special Isotope Separation Research and Development

The FY 1985 request for Special Isotope Separation (SIS) research and development continues work to evaluate and develop the Atomic Vapor Laser Isotope Separation (AVLIS) Process at the Lawrence Livermore National Laboratory (LLNL). Two key areas of work will be pursued at LLNL. The first area will be the process development system to demonstrate the full sized separator hardware that will validate the prototype design and permit deployment of an SIS prototype and plant scale production facility at Richland, Washington if this option is subsequently exercised. The second major area of work will be in laser performance, efficiency and lifetime. The requested funding will enable the continuation of laser work at LLNL making it possible to meet the prototype laser performance requirements.

In FY 1984, \$60,000,000 was provided for SIS development. The level of funding requested in FY 1985 is \$30,000,000. This funding supports operation of the full scale AVLIS process demonstration system at LLNL by FY 1987 and preserves the option to operate a prototype at Hanford by FY 1989.

The Process Facility Modification Project (Project 84-D-135) is being deferred one year for reconsideration as it is not required in the near term unless an SIS production facility is built. In the longer term, however, the additional recovered plutonium can be utilized for blending if an SIS production facility is not built.

The reduction in operating funding from FY 1984 reflects termination of funding at Los Alamos National Laboratory within the SIS program. Activities at Los Alamos will be reoriented to address laboratory needs at Los Alamos - specifically for small quantities of nonfissile isotopes of plutonium for weapons research and development work. This work will be funded elsewhere within the Department's defense program but outside the SIS program.

A commitment to an SIS production facility is not being made in FY 1985 because of the uncertainty as to whether a production facility is required. The SIS process has the highest cost (in total dollars and in dollars per gram of additional plutonium) of the various methods of increasing productivity. The SIS process also requires the most lead time, and is the most technologically uncertain.

There are alternatives to SIS which adequately address currently projected plutonium requirements. However, the SIS technology has a number of potentially useful applications. For these reasons, the preferred approach at this time is to plan for a full scale process demonstration at LLNL by FY 1987, and to review the option for a production facility at Richland on an annual basis.

Other Sites and Activities

FY 1985 funding increases are requested for processing of nuclear materials at the Los Alamos National Laboratory in FY 1985.

Nonspecification plutonium recovery activities increase significantly to meet requirements. A funding increase of \$3,427,000 is required to recycle plutonium process material accumulated in previous years, to package wastes and to provide analytical support. Some of the increase is for health physics personnel necessary at the plutonium recovery facility for radiation monitoring due to increased workloads.

Production of ceramic-grade plutonium oxide will be increased to meet greater requirements of the reactor test program. The process prepares ceramic-grade plutonium by chemical purification and calcination. An increase of \$4,185,000 provides for this increased plutonium processing including residue recovery. The funding increase provides for additional efforts on radiation protection activities to support the processing of plutonium and residues of higher radiation exposure.

The FY 1985 request includes \$2,900,000 in additional funds for nonproduction fuel decladding activities at Santa Susana, California, that provide cost effective recovery of nuclear materials. Activities of the uranium (primarily uranium-235) Central Scrap Management Office will be increased at Oak Ridge, permitting the processing of the inventory of weapon-grade uranium scrap for the cost-effective recovery of highly-enriched uranium. Small quantities of uranium-233 scrap will be processed to a safe and storable product. Oak Ridge requires an additional \$1,215,000 to accomplish these activities.

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Base</u>	<u>FY 1985</u> <u>Request</u>
C. <u>Supporting Services</u>	\$ 207,960	\$ 258,460	\$ 257,985

Supporting services are essential to maintain the production sites' operations at their increased levels and to continue the initiatives to increase production of nuclear material for national defense. These important activities include all site operations as well as new or improved production capabilities, such as, the facility restoration program, New Production Reactor studies, tritium production research, Savannah River fuel improvements, and others.

Research and development on current operating processes is conducted to assure continued, efficient, and safe operation to meet production goals. This effort includes process optimization to maximize production at minimum unit cost, development of alternative production methods to respond to changes in production and product requirements, development of engineering improvements for fuel handling, environmental protection and safety concerns, etc. With the increase in materials requirements experienced over the last few years, it is essential to maintain an adequate level of process research and development effort.

General

FY 1985 funds provide for the startup, shutdown, and standby costs relating to production facilities which will be needed either to meet current material requirements or for anticipated or possible future requirements. Other supporting services activities include production of lithium and uranium metals for weapons; transportation and security shipments; conceptual engineering studies; safety, environmental and safeguards costs; long-range nuclear materials management planning; general site safety improvement activities; warehousing; funding of inventories such as common use stores, process spares, and production of other nuclear materials inventories; and miscellaneous contractor activities such as award fees, employee group insurance, and employee pension funds.

Procurement of process spares in FY 1985 is essential to assure continued plant operations in the event of equipment failure, especially for fuel fabrication, fuel processing, and reactor refueling.

Reactor Operations Support

At Richland, procurement of zirconium, a funded inventory, will be continued to support the increased finished fuel fabrication effort required to operate N Reactor on a weapon-grade plutonium production mode. Additions will also be made in inventories of spare parts for old and often obsolete reactor components. On the average, this program should be cost effective by adding a minimum of two or three reactor operating days per year while avoiding the chance of extended outages.

The FY 1985 technical development funds at Richland include those costs associated with development of new and improved processes for fuel fabrication and irradiation activities. Funding provides for continuing investigation into end-associated fuel element failures, activated corrosion product behavior in the reactor primary coolant, N Reactor life capability and advanced non-destructive examination methods to improve surveillance and inspection of equipment. These efforts are resulting in procedure changes for improving primary coolant water chemistry control and in specific projects, such as, a magnetic filter installation to reduce personnel exposure during primary system maintenance.

The FY 1985 funding for Savannah River provides operating expenses for common use stores and process spares inventories to support reactor operations. This includes acquisition of additional process spares and common use stores to support recent changes and additions in reactor equipment as a result of restoration and upgrade programs to improve productivity.

During FY 1985, the Savannah River Laboratory will continue to perform technical development activities in support of site operations. Among these activities are: preparation of a Technical Data Summary for improved emergency cooling for the reactors; and development of improved anticlogging/anticorrosion procedures for the Savannah River reactor heat exchangers.

Activities are continued for reworking heavy water used by the Savannah River production reactors to conserve the Department's inventory.

This request includes level-of-effort funding for the New Production Reactor to continue environmental, safety, and system studies initiated in FY 1984. A final recommendation of site and concept will be made to the President on a schedule consistent with having a New Production Reactor operational in FY 1996. If the President's decision is to proceed with the program, we expect to submit a supplemental request for additional FY 1985 funding. The New Production Reactor is required to ensure the availability of tritium to meet long-term national security requirements. The continued production of tritium is, and will remain, vital to maintaining the nuclear weapons stockpile. Since tritium has a half-life of 12.3 years, the tritium inventory decays at a rate of 5.5 percent per year. Tritium is currently produced in the production reactors at Savannah River. Although specific failure mechanisms that would limit the lifetimes of the production reactors at Savannah River have not been identified, these facilities are now about 30 years old. Since it would take about 10 years before a new reactor could be designed, constructed, and put into a production mode, the Savannah River reactors will have to be the primary source of tritium until they are about 40 years old. In spite of the extensive restoration of these reactors currently in progress, there is an increasing probability over time that they could become unavailable.

The FY 1985 budget will provide an \$8,100,000 operating expense increase to complete tritium production research and development efforts at Richland, Savannah River, and San Francisco related to providing a backup tritium production capability.

Fuel cycle improvements research and development activities at Savannah River and San Francisco will be continued. This activity has considerable promise for the Materials Production program. The FY 1985 operating budget will provide an additional \$ 3,700,000 over FY 1984 funding for this activity. Equipment for separating unwanted uranium isotopes from the recycled enriched uranium used for reactor fuel fabrication will be installed in a building adjacent to the enriched fuel tube fabrication building at Savannah River. One separations module, power supplies, controls, a refrigeration system and glove boxes for handling uranium will be installed in the building. Building modifications will include addition of a ventilation system to filter and exhaust uranium glove boxes, modification of the existing power substation, and renovation of the existing shops and control room. Casting and other support systems in the building will be supplemented with machinery for fabricating separator feed plates, nondestructive examination equipment and equipment for removing collected product and byproduct uranium. Installation of the separations equipment will begin during FY 1985 with completion in FY 1987. Following successful experimental operation of the process, production will begin in FY 1988. When in operation, the plasma separations process will increase reactor production and decrease the need for virgin oralloy from the gaseous diffusion plants. Because of resulting increases in reactor efficiency, it is anticipated that additional plutonium will be produced through the 1990's with an effective value of \$60,000,000. Waste management requirements will be reduced by \$500,000 per year. Clean up of the fuel stockpile will increase its market value to \$400,000,000. The total cost, operating expenses and equipment, of the plasma separations process plant is estimated to be \$90,000,000 with a projected pay back period of four years. By 1991, all initial costs will have been recovered, because of the decreased oralloy and waste management requirements and thereafter, this program will then effectively result in annual net savings of \$37,500,000 as long as the Savannah River Reactors continue to operate.

The reactor safety analysis review program at Los Alamos National Laboratory, necessary to meet agency requirements for independent review and analysis of reactor production facilities, will continue in FY 1985.

Materials Processing Support

Funding for startup activities at Idaho is also included under the supporting services category. In FY 1985, systems operational testing and operator training will continue to support the planned startup for the processing segment of the FAST facility in March 1985. Other projects requiring startup funding for systems testing and development of operating procedures are the Remote Analytical Facility Upgrade and Expansion project (81-D-131) and the Fuel Processing Facilities Upgrade project (82-D-136).

At the Oak Ridge National Laboratory, activities are scheduled during FY 1985 for the hot startup and initial operations to convert a solution of uranium-233/uranium-235 to a safe, storable, oxide form. Uranium-233 bearing scrap nuclear materials will be processed for recovery of the uranium to make it available for research.

At Richland, PUREX processing support activities will continue at a lower level than during startup in FY 1984 to assure a smooth sustained operation after more than eleven years of facility down-time and to provide studies for extended PUREX processing capability. PUREX processing support also will include safeguards and security activities and procurement of process spares for facility systems to insure uninterrupted operation. Due to a one year deferral, equipment engineering and development activities for the Process Facility Modification project (84-D-135) will decrease by \$5,000,000 in operating expenses.

Engineering and chemical process development will be increased to support increased production activities. At Savannah River the development activities in FY 1985 include completion of a Safety Analysis Report for the fuel processing plants, support of operations tests of the new equipment to be used in the New Special Recovery facility, and support of the hot startup of the new HB-Line located at the H chemical processing plant.

The facility and process safety analysis review program at Los Alamos National Laboratory, necessary to meet agency requirements for independent review and analysis of new and modified production facilities, will continue in FY 1985.

Research on the Test Isotope Production program will continue at the Los Alamos National Laboratory. A laboratory scale continuous flow loop will be completed in FY 1985. This facility will be utilized for process demonstration experiments.

Restoration

The facility restoration activities are in the fifth year of a program that is planned to be funded over a 6 year period. The facility restoration program will increase the productivity of the agency's production complex, separations processes, and supporting plant services. Without the program, these facilities, now about 30 years old, would continue to deteriorate. FY 1985 operating funds include a \$1,205,000 increase and will be used to perform cost funded maintenance tasks, project engineering, operations liaison and construction management activities in support of the capital program.

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Base</u>	<u>FY 1985</u> <u>Request</u>
D. <u>Enriched Material</u>	\$ 140,000	\$ 140,000	\$ 245,300

The FY 1985 request of \$245,300,000 will provide \$124,300,000 for separative work requirements related to obtaining slightly enriched uranium fuel for continued operation of N Reactor, conversion of one Savannah River reactor to a Mark 15 core loading by late FY 1986, and conversion of two other Savannah River reactors by late FY 1987. In addition, this will allow Oak Ridge to rebuild its stockpile of slightly enriched uranium tetrafluoride that will be severely depleted during FY 1984. Such a stockpile is necessary to assure uninterrupted operation of the Feed Material Production Center at Fernald, Ohio.

The remaining \$121,000,000 provides separative work requirements to obtain enriched uranium for manufacturing reactor fuel to power the U.S. Navy's nuclear fleet.

E. <u>Program Direction</u>	\$ 17,500	\$ 17,900	\$ 20,300
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The FY 1985 request for program direction provides for salaries, benefits, travel, and program direction support for Headquarters staff at Germantown, Maryland, and for the Savannah River Operations Office. The request provides for 336 full-time equivalents of which 57 are for DOE Headquarters staff and 279 for the Savannah River Operations Office. This includes a potential reduction of up to five full-time equivalents at Savannah River for management savings in areas identified in the Grace Commission report. The funding increase of \$2,400,000 over the FY 1985 base level supports increases of eight full-time equivalent positions, increases for supporting contractual services that were underestimated in FY 1984, and increases for changes in the mix between full-time and other-than-full-time employees.

In FY 1984, we are also proposing a possible reduction of two full-time equivalents (one for Headquarters and one for Savannah River) as the result of anticipated management efficiencies. This would result in final full-time equivalent totals of 55 for Headquarters and 276 for Savannah River. The increases discussed below are based on staffing levels prior to any possible reductions for management savings. 412

Headquarters

The Headquarters FY 1985 request of \$3,200,000 for program direction provides for salaries, benefits, travel and supporting services for 57 full-time equivalents at the facility in Germantown, Maryland. This staffing level includes four positions in the Office of the Deputy Assistant Secretary for Nuclear Materials and also includes five staff positions responsible to the Assistant Secretary for Defense Programs for independent overview and assessment of all Defense Programs environmental, safety, health, quality assurance and standards activities except in the weapons area.

The staff devotes primary attention to such activities as:

- o Program direction, management, and overall support;
- o Development of program goals, objectives, and plans consistent with Administration policy;
- o Formulation and justification of the proposed budgets and program initiatives to the Office of Management and Budget and the Congress;
- o Performance of management reviews, technical reviews, safety evaluations and other studies, analyses, and evaluations to assure program accomplishment to continually optimize technical, managerial and economic aspects of the program; and to assure effective, efficient, safe, secure, and environmentally-acceptable program operation;
- o Coordination of program with other agency programs, other Federal agencies, the Office of Management and Budget, the Congress, the United Kingdom, and other allies, field offices, and numerous contractors.

Other staff activities include responses (briefings, meetings, correspondence, etc.) to inquiries from Congress, government agencies, foreign governments, special interest groups, private industry and the public. Other functions integrated into the program requiring special and increasing staff attention include special nuclear material safeguards, transportation and site security, intelligence consultation, DOE operational security, new classification guidance, new guidance on protection of unclassified controlled nuclear information, quality assurance, nuclear and occupational safety, environmental protection, health and safety of the public and independent environmental protection, safety, health protection and quality assurance overview. All of these ancillary activities require substantial Headquarters manpower.

The FY 1985 staffing level represents an increase of one full-time equivalent. This additional position is needed in FY 1985 and beyond to help plan and manage increased program activities, including, safeguards and security, environmental, and construction, which are crucial to successfully achieving the objectives of the Department's nuclear materials production program.

Savannah River

The FY 1985 program direction request of \$17,100,000 for the Savannah River Operations Office provides for the salaries, benefits, travel, and support services of 279 full-time equivalents. This includes an increase of 7 full-time equivalents to meet programmatic requirements and a potential reduction of up to 5 full-time equivalents for management savings identified in the Grace Commission report for such areas as GOCO Micro Management, Span of Control, and Pay/Personnel. This 5 full-time equivalent reduction is a target and studies will be conducted to identify possible areas of reduction. The requested funding level is computed on the basis of staffing requirements (284 full-time equivalents) prior to any staffing reductions for management savings.

The Savannah River Operations Office is responsible for the direction and oversight of the Nuclear Materials Production, Weapons Activities, Defense Waste and Byproducts Management, Naval Fuels Materials Facility, and other programs at the Savannah River Plant, which currently employs about 11,000 contractor personnel. The Savannah River Operations Office provides the major support for conduct of materials production activities and accounts for about 50 percent of the annual Nuclear Materials Production Program funding. The programmatic and administrative management required to protect the government investment in a site of this size is in itself a substantial undertaking.

The Savannah River Plant operates four nuclear production reactors. These reactors are supported by fuel and target fabrication, chemical processing, and radioactive waste storage facilities. Activities begun or expanded since FY 1981 and continued into FY 1985 include the upgrade and operation of L Reactor, production of high-purity plutonium for blending, facility restoration, reactor safety improvements, development of new and more efficient methods to increase nuclear materials production, increased security efforts and methods, and numerous activities covering the health, safety, security and environment of the Savannah River Plant operations. Design will be continued and construction will be initiated in FY 1984 on the Defense Waste Processing Facility which will lead to solidification of high level radioactive waste beginning in 1989. This activity is supported in the budget of the Office of Defense Waste and Byproducts Management. Construction activities for the Fuels Materials Facility in support of Department of Defense and Department of Energy Naval Reactors program responsibilities will also continue in FY 1985.

The programmatic staffing increase of seven full-time equivalents is needed to help meet requirements as the result of the increased production and waste management programs at the Savannah River site. These positions will be used to support new construction and related support activities in the Defense Waste Processing Facility estimated to cost about \$910 million, nuclear safety and industrial safety related to construction and new operations activities, environmental activities as the result of increased emphasis on environmental surveillance and remedying the environmental impacts on site, and increased security activities.

	<u>FY 1984</u> <u>Appropriations</u>	<u>FY 1985</u> <u>Base</u>	<u>FY 1985</u> <u>Request</u>
II. <u>Capital Equipment</u>	\$ 98,500	\$ 98,500	\$ 128,660

Reactor and processing operations utilize large, unique, and expensive items of equipment. A significant portion of this equipment is approximately 30 years old. In the corrosive environment of fuel processing facilities, stainless steel or equivalent material resistant to corrosion must be used. Also, because of the high radiation levels in the processing facilities, equipment must be specially designed for remote in-place maintenance and removal. Nevertheless, the FY 1985 capital equipment request is less than 1 percent of the total investment in the nuclear material production facilities.

The increased FY 1985 request includes funds to provide maintenance equipment for the large production facilities recently initiating production, such as PUREX and FAST.

Equipment is repaired and maintained to assure a high level of operation. When replacement parts are no longer available for the installed equipment (up to thirty years old), modern replacement equipment should be procured, installed, and integrated into the remainder of the process systems. However, in many instances, old equipment must be repaired and irreplaceable parts must be fabricated on site, an expensive and inefficient alternative.

A. Reactor Operations

Capital equipment funds will be used to support full operation of the four reactors at Savannah River and N Reactor at Richland. The major portion of the increased funding for N Reactor will provide an inventory of key replacement equipment items to assure sustained operability. Oak Ridge funding supports the reactor feed plants at Fernald and Ashtabula, Ohio, and the Y-12 Plant at Oak Ridge, Tennessee.

Savannah River

New items of capital equipment needed for the Savannah River reactor operations include new gamma sensors for the axial power monitor system (\$3,000,000). This would permit elimination of the traveling wire flux monitor and would enable calibration of each monitor independently and as often as necessary without exposing personnel to radiation. Another large category of capital equipment requested for Savannah River includes the consolidation of AC and DC power systems at each operating reactor to permit reduced operator manpower requirements during normal operation (\$1,000,000). Examples of other items include replacement and upgrade of an existing process computer, equipment for automation of a fuel fabrication handling operation, replacement of deteriorated equipment in the K and C reactor heavy water purification systems, installation of reactor vessel acoustic monitoring systems on all reactors, acquisition of two replacement shield system heat exchangers, and provision for additional independent reactor water level sensor on all reactors to improve emergency cooling system reliability. A major item of Automatic Data Processing equipment will be purchased at Savannah River to provide increased reactor safety and control (\$700,000).

Oak Ridge

The major item of capital equipment for Oak Ridge is \$3,700,000 for the Fernald, Ohio, Feed Materials Production Center for a Prototype Multi-Casting Remelt Furnace. The existing uranium melting furnaces at Fernald are over 30 years old and in serious need of replacement. This new furnace will satisfy a need for exploring new techniques and advanced designs for uranium metal production to eventually replace existing N Reactor casting furnaces with more versatile equipment capable of producing such cost saving techniques as hollow castings, five current size castings with one melt, and larger size castings than now possible. Also, two turret lathes require replacement at Reactive Metals, Incorporated at a cost of approximately \$1,000,000.

B. Materials Processing

Capital equipment funds will be used primarily to support operation of the major chemical processing facilities at Richland, Savannah River, and Idaho. These chemical processing plants will be operating to process the output of the Savannah River reactors, the N Reactor at Richland, and spent naval reactor fuel at Idaho. Processing of enriched uranium at Oak Ridge and of plutonium oxide and nonspecification plutonium at Los Alamos National Laboratory also requires significant equipment procurement to maintain continuity of operations. A large inventory of replacement equipment items is required to be available for rapid installation when an equipment failure occurs that interrupts production operations.

The most critical items of equipment are those located in the chemical processing plant areas that are inaccessible to workers due to the extremely high radiation levels. These pieces of equipment are radioactively contaminated, must be replaced remotely and are not usually repairable because of their high radiation levels. Spare pieces of these equipment items must be on hand to minimize expensive downtime that stops production.

Savannah River

A major item of capital equipment at Savannah River is an annular dissolver (\$3,900,000) to be used in the F-area chemical processing plants for dissolving fuels from the production reactors. Other significant items of capital equipment include instrumentation equipment to measure the liquid level in the sumps of both the F and H area chemical process plants and to make this equipment compatible with automatic process control equipment. In addition, robotic equipment will replace the current manual system of taking process samples in both the F and H chemical process plants. Samples will be handled and analyzed automatically thus reducing the radiation exposure to personnel, increasing the safety posture, and improving operating efficiency.

Richland

Major expenditures of capital equipment are required to provide processing capability in the PUREX facility at Richland. Reactivation of the PUREX facility provided for adequate installed and spare process vessels (dissolvers, concentrators, tanks, etc.), transfer pipes and instrumentation. With PUREX now operating with almost all used equipment, major equipment expenditures to ensure continued operation will be necessary. Equipment spares will be procured and kept ready for installation consistent with reliability data. Improved safety and process efficiency are possible with process upgrades incorporating new equipment. Proposed process upgrades include replacement of worn electrical switchgear, replacement of electrical wiring which has deteriorated insulation, and separation of emergency electrical wiring and replacement of corroded piping.

Idaho

At the Idaho Fuel Processing Facility, a number of major equipment additions are planned to upgrade selected process systems and to improve operating reliability. Additionally, critical equipment items necessary to assure adequate inventory will be procured. Examples of significant capital equipment items planned for acquisition in FY 1985 include: shielded glove boxes for remote process samplers to reduce radiation and contamination hazards, a process off-gas filter shipping cask for transport of contaminated filters to the Radioactive Waste Management Complex, a headend process simulator to enhance operator training, an electrolytic dissolver for dissolution of stainless steel reactor fuels and an underwater saw for removing extraneous metals from spent fuels prior to processing. In addition to these major items, procurement of key valves, pumps, heat exchangers, computer interface and analytical equipment is also planned.

C. Supporting Services

A major category of capital equipment at Savannah River is the replacement of 10 radioactive waste treatment, monitoring and holding tanks, required as a result of failures (\$4,500,000). Examples of other equipment to support the safe and efficient operation of the Savannah River site include such things as acquisition of two replacement deepwell pumps to replace existing deteriorated equipment, acquisition of a transportable whole body counter to reduce employee time away from the work site, replacement of obsolete and high maintenance forced draft/induced draft fan turbine drives, and replacement of existing deepwells due to reduced supply capacity.

Also, \$10,700,000 in capital equipment funds will be used to procure plasma separations process equipment from TRW, Inc., for installation in an existing Savannah River building. This equipment is for the fuel cycle improvements program previously discussed under the supporting services operating expense portion of the budget.

D. Special Isotope Separation

Capital equipment to support the many laboratory-scale experiments being assembled at the Lawrence Livermore National Laboratory for the Atomic Vapor Laser Isotope Separation Process Demonstration System will be procured. Typical items to be procured are: lasers, laser optics, dye amplifiers, remote handling equipment, and special instrumentation. Of the total capital equipment funding, \$9,000,000 is for Special Isotope Separation.

E. Site General

Finally, capital equipment is procured to support plant-wide activities at all of the production sites. Such equipment is also required to provide for health, safety, environment, and safeguards concerns. Major capital equipment is needed at Savannah River for cooling tower fans, motors, and gearboxes. These cooling towers provide cooling for building air conditioning and process equipment. Maintenance costs have become excessive and replacement is necessary to continue operations. Another example of capital equipment needs is the replacement of multi-port valves for the production of steam and electricity cogeneration to support all site operations at Savannah River. These valves have reached the end of their useful lifetime and require replacement to ensure continued reliable operation.

A major item of automatic data processing equipment included in this request is an upgrade of the UNIVAC 1100/62 computer mainframe at Richland (\$990,000).

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Base</u>	<u>FY 1985</u> <u>Request</u>
III. <u>Construction</u>	\$ 240,100	\$ 275,400	\$ 241,950

The FY 1985 request for construction is \$33,450,000 below the FY 1985 base and is based on supporting continuing production activities. This level will provide for:

Prior year projects at various levels and new projects including:

- o General support, e.g., General Plant Projects and Plant Engineering and Design, various locations;
- o Continued facility restoration efforts at Richland, Oak Ridge and Savannah River to return critical production facilities to a condition adequate to meet mission requirements;
- o A one year deferral of the Process Facility Modifications project (84-D-135). This project will provide the capability for processing and recovering plutonium from Department-owned fuels not currently amenable to processing in the U.S. due to cladding, physical size, or other technical or economic considerations;
- o Production reactor safety projects at Savannah River and Richland that will improve the ability of reactor operators to manage emergency conditions and incorporate improved operating standards;
- o Modifications to the enriched uranium hexafluoride conversion facility at Oak Ridge necessary for highly-enriched uranium metal required for weapons production and later for reactor operations;
- o Modification of processing plant utility substations at Savannah River required to meet increasing nuclear material processing requirements;
- o Six essential safeguards projects at Idaho, Richland, and Savannah River required to maintain site security at the level identified necessary by internal Department reports and Congress;
- o A design-only project for restoration of the fuel processing facilities at the Idaho Fuel Processing Facility to assure support for the U.S. Navy nuclear program and recover valuable uranium for the Department's defense programs;
- o Initiation of a construction project essential to maintaining production capabilities at the Fernald Feed Materials Production Center;
- o Initiation of a project to build a new fuel fabrication facility at Savannah River to convert to powder metallurgy methods which will be both cost beneficial and more efficient to the fuel fabrication operations;
- o Initiation of a uranyl nitrate conversion facility at Savannah River to replace existing equipment and facilities at the Oak Ridge Y-12 Plant. The new facility will centralize conversion operations at Savannah River;
- o Completion of a slightly enriched uranium fuel storage project at Savannah River to support conversion of the reactors to a homogeneous (Mark 15) core loading.

Detailed information on individual construction projects is included in the Construction Project Data Sheets.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECTS OVERVIEW
MATERIALS PRODUCTION

<u>Project Number</u>	<u>Project Title</u>	<u>TECA/</u>	<u>FY 1985 Base</u>	<u>FY 1985 Request</u>
85-D-131	General Plant Projects, VL	\$ 32,000	\$ 0	\$ 32,000
85-D-132	Plant Engineering and Design	2,000	0	2,000
85-D-136	Components Protection System, 100-N area, RL	3,300	0	3,300
85-D-137	Vault Safety SNM Inventory System, RL	4,400	0	2,500
85-D-139	Fuel Processing Restoration, IFPF, ID	10,000	0	10,000
85-D-140	Productivity and Radiological Improvements, FMPC, OR	47,000	0	6,000
85-D-142	U ₃ O ₈ Fuel Tube Facilities, SR	15,500	0	8,000
85-D-145	Uranyl Nitrate to Oxide Conversion Facility, SR	1,800	0	1,800
84-D-125	General Plant Projects, VL	28,000	28,000	0
84-D-126	Plant Engineering and Design, VL	1,000	1,000	0
84-D-130	Modification Processing Facility Substations, SR	5,800	5,600	200
84-D-134	Safeguards and Security Improvements Plantwide, SR	47,800	12,000 <u>b/</u>	14,900 <u>b/</u>
84-D-135	Process Facility Modifications, RL	155,000	7,500	0
84-D-136	Enriched Uranium Conversion Facility Modifications, Y-12 Plant, OR	20,600	4,400 <u>b/</u>	8,000 <u>b/</u>
84-D-137	Facility Security Systems Upgrade, IFPF, ID	10,000	2,000 <u>b/</u>	8,000 <u>b/</u>
83-D-138	PUREX Filter Systems Improvements, RL	12,750	8,500	0
83-D-142	Fuel Dissolver Off-Gas Transfer and Treatment System, IFPF, ID	7,600	4,100	0
83-D-146	Water Pollution Control, FMPC, OR	9,500	4,000	4,100
83-D-147	Pollution Discharge Elimination, SR	9,650	5,500 <u>b/</u>	2,150 <u>b/</u>
83-D-148	Non-Radioactive Hazardous Waste Management, SR	22,100	6,500 <u>b/</u>	11,500 <u>b/</u>
83-D-180	Facility Storage Modifications, VL	15,800	0	6,500
82-D-118	N-Reactor Plant Security & Surveillance, RL	4,400	2,400	0
82-D-124	Restoration of Production Capa- bilities, Phase II, III, IV, & V, VL	367,250	97,134	72,800
82-D-126	Reactor Safety & Reliability, VL	40,600	14,500	11,300
82-D-127	Safeguards Improvements, SR	34,600	16,900 <u>b/</u>	6,700 <u>b/</u>
82-D-128	Plant Perimeter Security Systems Upgrade, IFPF, ID	5,400	3,000	400
82-D-136	Fuel Processing Facilities Upgrade, IFPF, ID	46,000	18,000	1,000
82-D-201	Special Plutonium Recovery Facilities, JB-Line, SR	65,800	26,000	28,800
81-D-131	Remote Analytical Facility Upgrade and Expansion, IFPF, ID	28,500	2,000	0
81-D-142	Steam Transfer Header, SR	18,400	7,400	0
	Prior Year Projects	-	- 1,034	0
			\$275,400	\$241,950

a/ Excludes CP&D and/or PE&D funds.

b/ Assumes approval of FY 1984 supplemental.

Department Of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: General plant projects, various locations	2. Project No. 85-D-131
3. Date A-E Work Initiated: 1st Qtr. FY 1985	5. Previous Cost Estimate: None
3a. Date Physical Construction Starts: 1st Qtr. FY 1985	
4. Date Construction ends: 4th Qtr. FY 1988	6. Current Cost Estimate: \$32,000
Date: 12/83

7. Financial Schedule (Prior year projects shown for comparative purposes)

Fiscal Year	Obligations	Costs			
		FY 1983	FY 1984	FY 1985	After FY 1985
Prior Year Projects	\$ xxx	\$11,959	\$11,297	\$ 2,992	\$ 0
FY 1983 Projects	25,900	4,440	9,122	8,780	3,558
FY 1984 Projects	28,000	0	5,160	10,000	12,840
FY 1985 Projects	32,000	0	0	6,400	25,600

8. Brief Physical Description of Project

This project provides for various items of new construction, additions, alterations, and retirements to the land, buildings and utility systems at Savannah River, Richland, Idaho, Oak Ridge, Albuquerque, and San Francisco to support program needs in the areas of health, safety, environment, safeguards, general support, materials production program needs, and other program requirements of the department.

Savannah River	15,700
Richland	9,600
Oak Ridge	1,200
Idaho	4,500
Site to be designated	1,000
Total Materials Production Program	32,000

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 85-D-131

9. Purpose, justification of need for, and scope of project

Although it is difficult to provide a detailed description of this type of project in advance, listed below are examples of subprojects under consideration. In general, the estimated cost given for each of the listed subprojects is preliminary in nature and primarily indicative of the size of the project. It should be noted also that the continuing study of requirements will result in some of the projects being changed in scope or postponed, or other projects being added, all depending on conditions or situations not apparent at this time.

Savannah River \$ 15,700

Minor Projects, each \$75,000 or less \$ 4,150

A continuing need exists for capital improvements, each costing \$75,000 or less, to general plant facilities to assure continued safe operation of plant structures and utilities. An estimate of \$25,000 is included in this project for the Savannah River Forest Station (SRFS) to fund minor modifications and improvement of existing facilities.

Improve Welding Facility, 105-K&C \$ 400

Provide 20' x 30' welding areas adjacent to the present 105-K&C Maintenance Shops to include A/C and heating as well as adequate equipment/work stations. The present welding facilities are inadequate in that the total space available is only approximately 150 square feet in each area. This makes handling of some jobs cumbersome and time consuming.

Area Office Building, 300-M \$ 500

Build a new office building in 300-M to replace and eliminate all office trailers currently in use in 300-M. There are currently four office trailers located in 300-M and a continuing shortage of space. Construction of these offices will eliminate the trailers, as well as permit full implementation of forecast Raw Materials training plans, currently delayed for lack of space.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 85-D-131

9. Purpose, justification of need for, and scope of project (Cont'd.)

Storage Vault, Fabrication Laboratory, SRL \$ 500

The existing facilities for storage of special nuclear material do not meet the requirements specified by the Department (DOE 5632.2 paragraph 66, SNN Vault).

Remove Old Plating Machine, 313-M \$ 200

Remove the equipment abandoned in place on Project S-1990. Fill concrete trenches and level the floor. Plating line will not be in use due to installation of new equipment. The space is required for other uses.

Process Development Laboratories \$ 250

Building 305-M has been acquired by SRL to provide space for separations processes development. Funds are required to convert portions of Building 305-M into laboratory space to support these process development programs.

Receiving Dock, 234-H \$210

It is proposed to build a loading dock with enclosed storage area on the north end of 234-H to facilitate unloading of trucks containing tritium shipping containers and to provide a badly needed storage area.

Uranium Oxide Repackaging Facility, 221-1F \$390

The Savannah River Plant currently has over 20,000 drums of depleted uranium oxide in long term storage. It is estimated that more than 5,000 of these require repackaging because the drums are rapidly deteriorating. This project requests funds to construct or modify a facility for handling drums and equipment for placing them in an overpack or transferring the contents to a new drum.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

9. Purpose, justification of need for, and scope of project (Cont'd.)

Construct Regulated Locker/Change Room, 221-1F \$550

Construct men's/women's locker room south of 221-1F to serve 100 people. No regulated change facilities are available close to 221-1F A-Line. Current facilities in 707-1F are inadequate and obsolete for current staffing and require personnel to traverse several hundred feet to clearance in SWP clothing to reach change facilities.

Seal Disassembly Area from Crane Control Room, 105-KC \$580

The central control rooms in Reactor Buildings 105-K and C are insufficiently isolated from the Disassembly Areas. A nuclear incident in the Disassembly Areas could render the Central Control Rooms uninhabitable due to airborne contamination. Proper sealing, and re-direction of ventilating systems is necessary to ensure essential post-incident occupation of these control rooms.

Expand Parking Lot, 200-F \$440

The continued use of a temporary parking lot with loose rocks, pot holes, and lack of parking lanes is not consistent with our high safety standards. This project will provide the required additional 150 paved spaces.

In addition to providing required parking spaces, this project will improve safety at the pick-up area by eliminating hazards associated with area vehicle traffic. These improvements would boost moral, improve safety, and alleviate concerns many area personnel have voiced about adequate parking lot spaces and a pick-up area.

Provide Uranium Oxide Storage Building, 221-1F \$ 990

Construct a Butler-type building with concrete slab floor and minimum services for long-term storage of uranium trioxide (UO₃) powder in drums. Building should be capable of storing at least 10,000 drums. F Area generates 2,000 to 3,000 drums of UO₃ powder/year for which additional long term storage must be complete in FY 1986.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

9. Purpose, justification of need for, and scope of project (Cont'd.)

Replace Service/Domestic Water Degasifiers, 200-F&H \$ 500

This project will replace F & H Area service and domestic water degasifiers. The degasifiers remove dissolved gases from water which then supplies the powerhouse boilers and domestic water and fire protection systems. The existing F & H Area water degasifiers are 25-year-old wooden structures which have been rebuilt several times. The wood structural members have deteriorated to the point where the entire structure must be replaced.

Provide Office/Lunchroom Addition to Building 322-M \$ 250

Building 322-1M has served as office space for supervision and lunch/conference room for all personnel in Building 322-M. This project will replace Building 322-1M (mobile unit) with a permanent addition to Building 322-M.

Stores Warehouse, 713-A \$ 400

Provide a pre-engineered warehouse building connecting Central Stores Buildings 713-A and 713-1A. Additional stores warehousing is required to provide expansion for accommodating stock requirements due to new and expanded SRP production programs.

Spot Cooling System, 484-D \$ 660

Temperatures in D-Area Powerhouse exceeds 120°F during the summer months. These areas need to be upgraded to meet all heat stress standards to reduce the potential for personnel injury.

Provide Ventilation Disassembly Area, 105-PKC \$ 960

The disassembly work area does not have an air exhaust fan. The supply fan (EP 918) is provided with steam for heating but no cooling is provided. Air flow out of the area is via the various personnel entrance ways and openings required for conduits and piping. During the summer season, the lack of refrigeration and low air flows, further affected by the large exposed basin water surface, combine to produce conditions not conducive to an efficient work environment. Low air turnover rate in the area also contributes to tritium uptakes. Basin water tritium content is in 0.2 - 0.4 uc/ml range.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 85-D-131

9. Purpose, justification of need for, and scope of project (Cont'd.)

Substation - Section E, 773-A \$ 200

Section E of Building 773-A is furnished electrical power from several substations near other sections of the building. The multiple source feeders are a violation of the National Electric Code, and all available capacity has been committed, preventing future expansion. A new 1000 KVA, 13.8 KV - 480 volt outdoor substation is required to provide adequate, safe service to this area of the building.

Provide Personnel Monitoring Facility, 773-A \$ 250

Renovate Room B-164 and other possible locations to provide facilities for installation of personnel monitors (PM-6) and hand & shoe monitors for radioactive monitoring of personnel before exiting Building 773-A.

The presently used "walkover monitors" are being replaced with personnel monitors that will provide improved radioactive monitoring surveillance of personnel exiting Building 773-A and other area locations. Locating the three personnel monitors in the C-190 corridor will interrupt personnel and materials traffic flow and present a cluttered, obstructive appearance.

Air Condition Maintenance Shop, 773-A \$ 250

The present air conditioning system for the machine shop and metal fabrication shops in Building 773-A is inadequate. Air conditioned shops are now common practice for most of the Savannah River Plant site. Retrofitting the Maintenance shops with air conditioning would bring them up to site standards, eliminate the overload on the existing system, and provide a less fatiguing and safer work environment.

H & V Motor Rooms, 105-P, K and C \$ 500

Funds will provide additions and/or modifications to the ventilation systems in 105-P, K and C to reduce the temperature in the motor rooms while maintaining current differential pressure limits. The temperature in the motor rooms reaches 110°F during the summer months. A system to reduce the temperature in the pump rooms is necessary to improve working conditions and reduce thermal degradation of wiring and equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

9. Purpose, justification of need for, and scope of project (Cont'd.)

Short Term Storage and Office Space, Reactor Areas \$ 450

There is no covered storage available outside the 105 P, K and C reactor buildings. An enclosed building is needed for temporary storage of consumable stores, especially toxic and flammable substances. Storage inside the reactor building encourages poor housekeeping and increases the potential for fire.

Projects with a TEC of \$100,000 - \$200,000 \$2,120

Relocate Steam Supply Line to 786-A	\$100
Relocate Chemical Stores, 773-A	100
Material Life Test Facility	130
Shipping Container Pressure Test Vessel, 723-A	80
Additional Womens Change Room, 707-1F	130
Automatic Effluent Diversion, 232-H	180
Change Room Expansion, 704-M	160
Paved Lower Steel Yard Adjacent to 745-A	120
Paved Containment Area, 733-A	160
704-U Waste Disposal System, SRL	180
Replace Transformer, 652-22G	100
Improved Security Lighting, TNX	190
Service Floor Restrooms, 773-A	120
Enclose F-Wing Truck Dock, 773-A	100
Unloading Dock, Tech. Area	150
Storage Building, Tech Area	120

Richland \$9,600

Miscellaneous Capital Work Orders \$1,600

These are miscellaneous jobs of capital nature, which are necessary to maintain continuity of operation, protection of the environment, and to provide safeguards for the protection of life and property. Included are additions, improvements and replacement, of structures, building services utilities, and associated equipment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

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

T Plant Ventilation Upgrade \$ 700

The project will provide a ductwork connection from the original exhaust ductwork to the new HEPA filter system on the roof of 221-T. The ductwork will provide augmented air flow through the exhaust tunnel without increasing the air flow rate through the sand filter. In addition, this project will provide an alternate exhaust flow should the sand filter be taken out of service due to failure or for maintenance.

PUREX Crane and Elevator Cable Upgrade \$ 600

This project will replace the festooned electrical feeder cables and control system for the PUREX canyon bridge crane. The PUREX elevator power cables and control system will also be replaced. These existing cables and control system are the original PUREX equipment installed in 1952. Their replacement is required to provide a safe and reliable crane and elevator system to assure continued PUREX operation.

PUREX High Voltage Switchgear Upgrade \$900

This project will provide new high-voltage switchgear and related auxiliaries to replace the existing outdated system. The existing system was installed when the PUREX facility was built in the early 1950's, and has become obsolete and unreliable. New high-voltage switchgear is necessary for reliable PUREX operation.

T Plant Maintenance Support Facility \$850

This project will provide a 10,000 square foot pre-fabricated metal building and appurtenances located adjacent to the 271-T building. Standard building services will be provided, including office space, tool crib, women's change room and sanitary services. The facility is required because T Plant will be used for process R&D, equipment repair, and storage of repaired equipment and other replacement parts. The Maintenance Support Facility is required to support T Plant utilization.

PUREX Radiation Zone Access Control \$700

This project will replace the PUREX dispatcher's control panel and remotely operated door locks. Other related radiation zone access control will also be upgraded to automatic systems. More efficient use of PUREX management staff will be possible by the automated system, and improved monitoring of personnel location inside the PUREX facility will contribute to a safer operating environment.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

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

PUREX Plant Process Control Improvements \$900

This project will provide the latest state-of-the-art process control improvements for selected PUREX processes. This project will incorporate new technology now being optimized for PUREX. The improved system will be based on key PUREX operating parameters, and is expected to provide more efficient operation with less process downtime due to the tighter process control made possible by this project.

100-N Fire Protection Improvements..... \$950

This project will provide for upgraded fire protection at various locations around the N Reactor Plant and one location in the Fuels Production area. Modifications will include supplying hose stations and extending sprinkler and heat or smoke detector coverage to presently unprotected locations, especially in areas where combustible materials are stored and over cable trays. Certain existing detectors and pull boxes will be relocated to more effective or accessible locations. In areas containing electrical equipment, heat detectors will be replaced with smoke detectors. Interlocks will be provided to isolate the control room ventilation system from the Pile Instrument and Electrical Room (Room 6). Tamper switches will be placed on presently unsupervised valves, including all outside fire protection post-indicating valves. Existing fire protection systems in the 333 Building (Fuels Production Area) and at the N Reactor Plant will be generally upgraded to eliminate double alarm annunciators, correct wiring faults, waterproof vulnerable components, replace defective detectors, etc. to meet National Fire Codes and the National Electrical Code.

Centralized Storage and Staging \$900

This project will provide for a two-story, corrugated metal building of approximately 80 feet by 150 feet base dimensions to be used as a maintenance storage, staging, and craft center. As a result of the spare parts upgrading program, approximately 7,000 square feet of storage space (currently unavailable at the 200-E storage area) is required to provide environmentally sound storage for critical spare parts. Approximately 5,000 square feet is needed to house riggers, painters, carpenters, and their equipment. Present shop areas are inadequate to handle increased workloads resulting from the 6% plutonium production mode.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

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

Approximately 4,000 square feet is needed for a maintenance staging area to inspect and requalify new or modified large equipment prior to plant installation. The 1705-N Building, which had previously served this function, has been modified for a different function.

Fuel Canister Decontamination Facility, KE/KW \$750

This project will provide for a decontamination facility at the 100-K Area. The decontamination facility will be used for the removal of transuranic contamination from used fuel canisters and will be designed to reduce transuranic levels in and on the canisters to less than 100 nanocuries per gram prior to canister disposal. Equipment for more intensive decontamination methods than a simple water spray (e.g., high-pressure water, vibratory finishing, etc.) will be required to meet this criterion. The purpose of the proposed decontamination facility is to reduce the disposal cost of used fuel canisters. The disposal cost of material contaminated with transuranium elements is nearly twice that of radioactive waste material having no transuranium contamination.

Instrument Air Improvements \$750

This project will provide for the design and installation of redundant instrument air system components and other modifications to maximize the overall system reliability. The proposed modifications will assure that a single active component failure in the instrument air system will not render critical reactor systems inoperable nor cause system transients sufficient to shut down N Reactor.

Subsequent to a recent abnormal occurrence where instrument air was lost to N Plant auxiliary building, investigations of the instrument air system were performed. These investigations identified design deficiencies that warrant corrective action. The purpose of this project is to provide the required modifications to protect against system transients that now can be caused by an interrupted supply of instrument air. The transients can be of sufficient magnitude to cause shutdown of the N Reactor, and affect the amount of make-up water available to the reactor primary coolant system. Also, since certain controls in the turbine-generator steam supply and condensate systems are pneumatically operated, the continuity of on-site power generation could be affected.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

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

Oak Ridge \$1,200

Miscellaneous Items - Plantwide \$280

- a. Replacement of steam meters
- b. Test and replace electric power feeder cable
- c. Clean room facility to measure background levels of radioactive materials
- d. Replace underground water lines
- e. Replace underground power lines

Building Addition, Feed Materials Production Center \$320

Due to increased production requirements and the addition of new operating equipment in the reduction and recast area of Plant 5, additional space is required for maintenance facilities and production recording office space. This facility will be approximately 2,400 square feet providing additional maintenance shop area and office space for production recording personnel. This addition will include pressure cleaning equipment as well as a sump and ventilation equipment.

Warehouse for Storage of UO₃, Feed Materials Production Center \$600

The warehouse will be approximately 12,000 square feet and will be located on the west side of Plant 8. This warehouse is required because UO₃ returns from the reactor sites are scheduled greater than the production requirements.

Idaho \$4,500

CPP-601, P-Cell Sampler Replacement \$500

Spent nuclear fuel is processed in the Fuel Processing Facility (CPP-601). The second cycle of the solvent extraction process portion of the processing operation is performed in P-Cell. The sampler system for P-Cell was installed when CPP-601 was constructed over 25 years ago. It has deteriorated through normal wear and corrosion and

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

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

is severely deficient when compared to state-of-the-art sampling systems. This deterioration plus the deficiencies decrease the safety, reliability, functional use and efficiency of the samplers. Specific occurrences and conditions being experienced with the existing sampling system include contamination, personnel radiation exposure, sampling equipment failures and transportation of samples to the remote analytical laboratory.

Replacement of the samplers and an improved sample transport system are needed to preclude the following occurrences: (1) temporary shutdown of the IFPF due to inadvertent contamination incidents; (2) avoidable shutdown of the IFPF due to sample station problems and failures resulting in decontamination and hands-on maintenance; (3) accumulation of personnel radiation exposure beyond as-low-as-reasonably-achievable (ALARA) levels; and (4) unacceptable safety risks due to previously described items (1), (2), and (3). Loss of a key process because of inability to sample process streams would prevent operation of other essential ICPP processes and seriously impair the plant's ability to process nuclear fuel.

This project will correct these conditions by replacing the existing samplers with remotely operated, shielded and enclosed sampling stations. This project will also provide a sample transport system to transport samples from P-Cell to the RAL/CPP-601 Sample Transport System located in the West Sample Corridor in CPP-601.

CPP-601 PM Area Fire Protection System

\$200

At the present time, the Process Make-up (PM) Area for the Fuel Processing Facility (CPP-601) has no automatic fire suppression system. A fire in this area could cripple the fuel processing operation. Processing solutions are made up here, and fuel elements for reprocessing are charged into the process from this area. Also, other plant support systems such as the M Cell CO₂ fire protection system are located in this area, and could be rendered inoperative by a fire. Combustibles in the area are cardboard chemical storage containers and some flammable process liquids. Access to the process cells is through hatch openings in the PM Area floor. Plastic cell entry tents, wood scaffolding, paint, and other combustibles are generally present in the PM Area due to maintenance construction work in these cells. This project will install a wet sprinkler system, which would extinguish a fire in the PM Area before it could seriously effect the operation of the reprocessing plant.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations 2. Project No. 85-D-131

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

Service Building Fire Protection System \$200

Presently, the Service Building (CPP-606) has no automatic fire suppression system available. The need for such a system has been identified due to the following facts: (1) Combustible loading in the form of fuel oils, (2) Open areas containing important plant utility systems where fire could effect other processes, and (3) Recent application of insulating foam on the roof exterior. DOE Manual 6430, "General Design Criteria" sets forth the following conditions that are necessary for providing fire protection to a given area: (1) Whenever the potential for fire losses exceed \$100,000, fire protection must be considered, (2) Whenever expected losses exceed \$1,000,000, fire protection is required, and (3) If any loss will interfere with or stop plant processing functions, then fire protection must be installed. All these conditions exist with respect to CPP-606. The proposed fire protection system would increase the fire protection over crucial utility equipment, and help assure continuous utility operation. It would also help to assure personnel safety and greatly reduce property damage in the event a fire did occur.

Irradiated Light Water Breeder Reactor (LWBR) Fuel Storage Vaults \$950

IFPF has been designated as the storage site for the Shippingport LWBR irradiated fuel rods. There are approximately 17,000 fuel rods containing 505 kilograms of U-233. These rods are classified as nonprocessable at IFPF and retrievable storage must be provided. The storage facilities must provide for security and surveillance requirements. This project will construct dry underground fuel storage vaults lined with stainless steel. A lifting fixture will be provided for retrieving the fuel rods and geometrical controls will be used to ensure criticality safety. Vault shielding will be provided to minimize radiation exposure. Facility access will be restricted and TV surveillance maintained for security.

CPP-601, Q-Cell Sampler Replacement \$500

Spent nuclear fuel is reprocessed in the Fuel Processing Facility (CPP-601). The third cycle of the solvent extraction process portion of the processing operation is performed in Q-cell. The sample system for Q-cell was installed over 25 years ago when CPP-601 was constructed. Normal wear and corrosion have significantly

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

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

deteriorated the system. New state-of-the-art sampling systems have exposed severe deficiencies in the existing system. The deterioration combined with deficiencies have impaired the safety, reliability, functional use and efficiency of the samplers. Specific occurrences and conditions being experienced with the existing sampling system include personnel radiation exposure, contamination, sampling equipment failures and sample transporting.

Replacement of the samplers and an improved sample transport system are needed to preclude the following occurrences: (1) temporary shutdown of the IFPF due to inadvertent contamination incidents; (2) avoidable shutdown of the ICPP due to sample station problems and failures resulting in decontamination and hands-on maintenance; (3) accumulation of personnel radiation exposure beyond as-low-as-reasonably-achievable (ALARA) levels; and (4) unacceptable safety risks due to previously described items (1), (2), and (3). Loss of a key process because of inability to sample process streams would prevent operation of other essential ICPP processes and impair the plant's ability to process nuclear fuel.

This project will correct these conditions by replacing the existing samplers with shielded, enclosed sampling stations. This project will also provide a sample transport system to transport samples from Q-cell to the RAL/CP-601 Sample Transport System located in the West Sample Corridor in CP-601.

CP-601 Utility Line Replacement

\$500

The steam, compressed air and treated water lines in the Fuel Processing Facility (CP-601) have been in service for 30 years and are badly deteriorated. Numerous leaks in the piping, fittings and valves have required excessive maintenance. The systems have been shut down for repairs twelve times in the past two years to repair approximately 120 leaks. Many of the minor piping problems have become major in scope due to severe corrosion of the piping. Minor leaks and valve replacement usually involve removing several feet of pipe before pipe with enough base metal for threading or welding can be found. Debris from corrosion inside compressed air lines can cause the sensitive transmitters on Group I instruments to malfunction causing excessive instrument drift (as high as 50-60%). A failure in the steam lines can cause a shut down of steam jets, intercycle evaporators, steam spares or vessel heating jackets. A treated water line failure can require the entire line to be taken out of service since there are no individual isolation block valves and can require that the condensers and thereby the intercycle evaporators be shut down. Compressed air line failures can shut down pneumatic instrumentation to

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

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

in-cell systems, cause remote-controlled valves to "fail closed" and, hence shut down the evaporators. This project will replace the steam, compressed air and treated water headers, including isolation block valves on branch lines in CPP-601 thereby reducing maintenance cost and restoring the integrity and reliability of the systems in the facility.

CPP-601, Deep Tank Sampler System \$600

Intermediate-level radioactive wastes from the Fuel Processing Facility (CPP-601), the Analytical Support Laboratories (CPP-602) and the Remote Analytical Facility (CPP-627) are collected by two subsystems: the cell floor drain (CFD) collection system and the process equipment waste (PEW) collection system. The wastes from both collection systems drain to four 4500-gal tanks (deep tanks) located in vaults beneath the south end of CPP-601. From these tanks the waste is transferred to the PEW evaporation system. Samples from these deep tanks must be analyzed for uranium content before transfer to the PEW evaporation system. The existing sampler system has been in service over 25 years. Corrosion and normal wear have deteriorated the system to where it no longer functions adequately. Many improvements have been made in sampling techniques since these samplers were installed. Due to the deterioration and improved sampling techniques, the safety, reliability, functional use and efficiency of the existing samplers are inadequate. Several occurrences and conditions have been experienced including contamination, sampling equipment failures, sample transporting and personnel radiation exposure.

Replacement of the samplers and an improved sample transport system are needed to preclude the following occurrences: (1) temporary shutdown of the IFPF due to inadvertent contamination incidents; (2) avoidable shutdown of the IFPF due to sample station problems and failures resulting in decontamination and hands-on maintenance; (3) accumulation of personnel radiation exposure beyond as-low-as-reasonably-achievable (ALARA) levels; and (4) unacceptable safety risks due to previously described items (1), (2), and (3). Loss of a key process because of inability to sample process streams would prevent operation of other essential IFPF processes and seriously impair the plant's ability to process nuclear fuel.

This project will correct these conditions by replacing the existing samplers with remotely operated, fully shielded and enclosed sampling stations. This project will also provide a new sample transport system to transport samples from the Deep Tanks to the RAL/CPP-601 Sample Transport System located in the West Sample Corridor in CPP-601.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

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

ICPP Paint Shop Expansion \$200

The existing Paint Shop is located in the Maintenance Building (CPP-663) which was constructed in 1978. The Paint Shop was sized for a staff of 2 to 3 painters, IFPF currently employs 8 painters and projects to expand to 10 painters when FAST Facility (Project 77-13-a) comes on line. The spray booth in the paint shop is small and does not meet current industrial hygiene standards. Since the time of construction there has been a significant increase in the amount of epoxy painting (requiring more stringent ventilation controls) on equipment (pumps, valves, etc) for decontamination and corrosion protection. This demand will increase further when FAST and RAL become operational (1984-1985). Additional space is also needed for paint storage and other painting operations. This project will provide additional space, enlarged spray booth and drying facilities, a sandblasting booth, a water curtain, a sludge pit and proper ventilation to meet industrial standards.

Service Building Heating and Ventilation System Replacement \$700

The Service Building (CPP-606) houses the air supply units for the Fuel Processing Facility (CPP-601) and the Analytical Support Laboratories (CPP-602). These units are original plant equipment, and have been in service for more than 30 years. They are deteriorated, corroded, obsolete, and generally worn out. These worn out units cause erratic air temperatures which effect the performance of people, sensitive computers, and laboratory equipment. The control dampers are no longer functional. Spare parts are extremely difficult to obtain. This project will install new air supply units consisting of blowers, air plenum chambers, filters, steam coils, evaporative coolers, controls, valves, dampers, and duct work. This will provide for more constant temperature control and assure operating reliability for many years.

Miscellaneous Minor GPPs \$150

Each year small miscellaneous but very important minor GPPs are identified during the middle of the fiscal year. These are projects which require immediate attention. With all of the GPP funds previously committed, there are no funds remaining for such projects. This project will make funds available for implementing these small GPPs. The funding limit for each project is \$25,000. Individual descriptions for these projects will be written as they are identified. Typical examples of minor GPPs are: evacuation alarms, fire alarms, process cell hatches, ceiling replacements, waste line installations and small storage facilities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: General plant projects, various locations

2. Project No. 85-D-131

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

Site to be Designated \$1,000

Plasma Separations Process Laboratory \$1,000

This project will provide for modifications to an existing building, at a site to be designated, to support research and development activities for the Plasma Separation Process.

10. Details of Cost Estimate

It is not possible to provide a detailed cost estimate for this project. Cost estimates for general plant projects are normally included in the request for a construction directive after the need for the work has been established, the scope of the job determined, and the preliminary engineering completed.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and Location of Project: Plant engineering and design,
various locations

2. Project No. 85-D-132

3. Date A-E Work Initiated: 1st Qtr. FY 1985

5. Previous Cost Estimate: None

3a. Date Physical Construction Starts: N/A

6. Current Cost Estimate: \$2,000
Date: 7/83

4. Date Construction Ends: N/A

7. Financial Schedule of Project Funding

	<u>Fiscal Year</u>	<u>Auth.</u>	<u>Approp.</u>	<u>Obligations</u>	<u>Costs</u>
	1985	2,000	2,000	\$2,000	\$1,200
	1986	0	0	0	800

8. Brief Physical Description

This project provides for Architect/Engineer services (Title I and Title II) on Nuclear Materials Production program construction projects which are under consideration for authorization request in future years. This will allow certain designated projects to proceed from conceptual design into preliminary design (Title I) and definitive design (Title II) prior to formal Congressional authorization. The design effort accomplished under this project will be sufficient to assure project feasibility, define the scope, provide detailed estimates of the cost of construction based on the approved design and working drawings and specifications, and provide construction schedules including procurements. The design effort will generally be extensive enough so that construction can physically start or contracts be let for long lead procurement items in the budget fiscal year in which Congressional authorization is received.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Plant engineering and design, various locations	2. Project No. 85-D-132
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9. Purpose, Justification of Need for, and Scope of Project

Conceptual studies completed for a project, utilizing operating funds, define the scope of the project and produce a rough cost estimate and schedule. These conceptual design studies are completed 9-12 months before the budget is submitted to Congress, meaning that the studies are as much as 24 months old by the time authorizing legislation is enacted. The use of these project funds to proceed immediately upon completion of conceptual design into A-E designs (Titles I and II) would permit acceleration of new production facilities, provide savings in construction costs based on current rates of inflation and would permit much more reliable cost estimates being available to Congress when the budget is presented. Projects currently intended to be undertaken with FY 1985 PE&D funds are described below. Some changes may occur as a result of continuing conceptual design studies or developments prior to authorization and appropriation.

In-core Neutron Monitoring System, Richland, Washington \$ 800

This project will provide for the installation of a state-of-the-art in-core neutron flux monitoring system to replace the original N Reactor system. The increased monitoring and control capabilities provided by this project will lead to improved safety and productivity in the present operating mode and will be needed to permit operating in alternative production modes.

Productivity Retention-PUREX Electrical System Upgrade, Richland, Washington \$1,200

This project will include improvements and modernization of the original plant electrical system including separation of normal power from emergency power cable runs and replacement of aged power cables to the major switchgear location, and upgrading electrical switchgear. In order to maintain operation of the PUREX Plant and to accomplish required facility upgrades to improve operations and modernize the plant, certain facilities improvements proposed by this project will be required.

10. Details of Cost Estimate

Estimated Total Cost

a. Engineering design	\$2,000
b. Construction costs	0
Total Project Cost	\$2,000

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Plant engineering and design,
various locations

2. Project No. 85-D-132

11. Method of Performance

Design will be on the basis of negotiated architect-engineer contracts to the extent feasible.

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

Not applicable.

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

Not applicable.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Components protection system, 100-N Area,
Richland, Washington	2. Project No: 85-D-136
3. Date A-E Work Initiated: 4th Qtr. FY 1983	5. Previous Cost Estimate: None
Date:
3a. Date Physical Construction Starts: 3rd Qtr. FY 1985	6. Current Cost Estimate: \$ 4,000
3b. Date long-term procurement starts: 1st Qtr. FY 1985	Less amount for PE&D: 700
4. Date construction ends: 4th Qtr. FY 1986	Net cost estimate: \$ 3,300
	Date: 12/83

7. Financial Schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
413	1985	\$ 3,300	\$ 3,300	\$ 3,300	\$ 600
	1986	0	0	0	2,700

8. Brief Physical Description of Project

Funding for this project will provide for design and construction of a 100-N Area components protection system. The project will upgrade protection of the facility against the sabotage threat as identified by Sandia National Laboratories (SNL) and the UNC Security Master Plan.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Components protection system, 100-N Area,
Richland, Washington

2. Project No: 85-D-136

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

Implementation of the protection plan for the 100-N Area is detailed in the UNC Security Master Plan, UNI-1946 (SNSI), dated December 31, 1981. The project is required to assure compliance with DOE Notice 5632.2, "Physical Protection of Production Reactor Against Acts of Sabotage".

The rationale for funding level is supported by UNC Security Master Plan, UNI-1946 (SNSI), dated December 31, 1981.

10. Details of Cost Estimate^{a/}

	Item Cost	Total Cost
a. Field engineering and inspection at approximately 8% of construction costs, item b.	\$	\$ 160
b. Construction costs		2,575
1. Special facilities and installation	1,950	
2. Procurement of multiplexors, computer, sensors and associated electronic equipment	625	
Subtotal		\$2,735
c. Contingency at approximately 21% of above costs		565
Total Project Cost		\$3,300

^{a/}Based on completed conceptual design. Excludes \$700,000 in PE&D.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Components protection system, 100-N Area,
Richland, Washington

2. Project No: 85-D-136

11. Method of Performance

Contracting arrangements are as follows:

- a. Construction and Procurement will be accomplished by the onsite CPAF construction contractor.
- b. Field Engineering: By the onsite A-E.

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

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>Total</u>
a. Total Project Funding				
1. Total Facility Costs				
(a) Construction line item	\$ 0	\$ 600	\$2,700	\$3,300
(b) PE&D	700	0	0	700
(c) Inventories	0	0	0	0
Total Facility Costs	\$ 700	\$ 600	\$2,700	\$4,000
2. Other Project Funding				
(a) R&D necessary to complete construction	\$ 135	\$ 0	\$ 0	\$ 135
(b) Other project related costs	0	0	0	0
Total Other Project Funding	\$ 135	\$ 0	\$ 0	\$ 135
Total Project Funding	\$ 835	\$ 600	\$2,700	\$4,135

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CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Components protection system, 100-N Area, Richland, Washington

2. Project No: 85-D-136

b. Other related funding requirements (estimated life of project: 20 years)

1. Facility maintenance and operating costs	\$120
2. Programmatic operating expenses directly related to the facility	60
3. Capital equipment not related to construction but related to the programmatic effort in the facility	0
4. GPP or other construction related to programmatic effort in the facility	0
Total related annual funding requirements	\$180

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

a. Total project funding

1. Total facility costs

- (a) Construction line item - funds for construction.
- (b) PE&D - will provide for A-E services.
- (c) Inventories - none required.

2. Other project funding

- (a) R&D necessary to complete construction - funds budgeted for conceptual design.
- (b) Other project related costs - none identified.

b. Other related funding requirements - it is estimated that the facility will be used 20 years for its programmatic purpose.

1. Facility maintenance and operating costs - \$120,000 includes maintenance and operating costs.
2. Programmatic operating expenses directly related to the facility - \$60,000 is the incremental cost to increase patrol force by one.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Vault Safety Special Nuclear
Material Inventory System,
Richland, Washington	2. Project No. 85-D-137
3. Date A-E Work Initiated: 2nd Qtr. FY 84	5. Previous Cost Estimate: None
3a. Date Physical Construction Starts: 2nd Qtr. FY 85	6. Current Cost Estimate: \$5,000
Less Amount for PE&D: 600
Net Cost Estimate: \$4,400
Date: 12/83
4. Date Construction Ends: 1st Qtr. FY 87	

7. Financial Schedule

<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 2,500	\$ 2,500	\$ 2,500	\$ 500
1986	1,900	1,900	1,900	3,700
1987	0	0	0	200

8. Brief Physical Description of Project

This project will provide an automated, real-time Safety Special Nuclear Material (SNM) Inventory System for the Richland plutonium storage vault. As currently envisioned, the system, consisting of SNM canister monitors and associated data processing equipment, will monitor canister presence, identification, temperature, ambient air temperature and canister distortion. Data will be transmitted to the Rockwell Nuclear Material Accountability System.

Utility requirements include tie-in to existing power and emergency power as well as power filtering. Building modifications include equipment installation and some core-drilling to accommodate wire runs through existing concrete walls.

Requested FY 1985 appropriation will accommodate initiation of procurement, construction and Title III Inspection.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Vault Safety Special Nuclear
Material Inventory System,
Richland Plutonium Storage Vault,
Richland, Washington

2. Project No. 85-D-137

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

The purpose of this project is to decrease employee radiation exposure and increase SNM operations safety and safeguards. Specific benefits to be derived are:

- o Reduces radiation exposure to personnel conducting inventories of SNM stored in Richland plutonium storage vault. Personnel exposure reduced by installation of this system will be significant and consistent with the DOE "ALARA" criteria. Nuclear material control personnel currently conduct bi-monthly manual inventories resulting in significant exposure to personnel. Nuclear material control personnel also conduct manual monthly canister distortion checks which result in exposure to personnel. Overall radiation exposure reductions are estimated at 10-35 man-Rems per year. Actual radiation exposure reduction is dependent upon quantity of SNM in Richland plutonium storage vault rooms. The operating contractor limits exposure to 3 man-Rems per year per person.
- o Provides an early detection of SNM canister distortion caused by internal pressurization. Early detection of internal pressure will enhance capabilities to prevent rupture of the canister thereby greatly reducing the possibility of contamination of the facility, personnel, and environment. High dollar costs and additional personnel exposure required during cleanup will be avoided.
- o Provides capability to automatically inventory all SNM stored in the vault. This enhances protection from both a safeguards and a safety standpoint. SNM canister presence detection enhances criticality prevention by detecting unauthorized movement of SNM.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Vault Safety Special Nuclear
Material Inventory System,
Richland Plutonium Storage Vault,
Richland, Washington

2. Project No. 85-D-137

10. Details of Cost Estimate^{a/}

	<u>Item Cost</u>	<u>Total Cost</u>
a. Field engineering and inspection at approximately 9% of construction costs, item b	\$	\$ 130
b. Construction costs		3,140
1. Special facilities and installation	1,450	
2. Procurement of computers and associated equipment	1,690	
Subtotal		\$ 3,270
d. Contingency at approximately 35% of above cost		1,130
Total Project Cost		\$ 4,400

11. Method of Performance

Definitive design will be performed by Hanford on-site Architect-Engineer (A-E) contractor. Sandia National Laboratory will perform computer software design. Equipment procurement will be selected on the basis of competitive bids. Construction will be performed by the Hanford on-site construction services contractor on a CPAF basis.

^{a/} Based on completed conceptual design. Excludes \$600,000 in PE&D.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Vault Safety Special Nuclear
Material Inventory System,
Richland Plutonium Storage Vault,
Richland, Washington

2. Project No. 85-D-137

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

	Prior Years	FY 1985	FY 1986	FY 1987	Total
A. Total project funding					
1. Total facility costs					
a. Construction line item.....	\$ 0	\$ 500	\$3,700	\$ 200	\$4,400
b. PE&D.....	600	0	0	0	600
c. Inventories.....	0	0	0	0	0
Total facility costs.....	\$ 600	\$ 500	\$3,700	\$ 200	\$5,000
2. Other project funding					
a. R&D to complete construction.	\$ 540	\$ 0	\$ 0	\$ 0	\$ 540
b. Conceptual design costs.....	120	0	0	0	120
c. Other project related costs..	120	90	200	150	560
Total other project funding	\$ 780	\$ 90	\$ 200	\$ 150	\$1,220
Total project funding.....	\$1,380	\$ 590	\$3,900	\$ 350	\$6,220

B. Total related funding requirements (Estimated life of project: 20 years)

1. Facility Operating Costs.....	\$ 65
2. Programmatic operating expenses.....	0
3. Capital equipment not related to construction.....	0
4. GPP or other construction related to project.....	0
Total related annual funding requirements.....	\$ 65

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project:	Vault Safety Special Nuclear Material Inventory System, Richland Plutonium Storage Vault, Richland, Washington	2. Project No. 85-D-137
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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

A. Total project funding

1. Total facility

- a. Construction line item - no narrative required.
- b. PE&D funding is \$600,000 in FY 1984.
- c. Inventory funding is not requested.

2. Other project funding

- a. Sandia National Laboratory is expected to spend (through FY 1983) approximately \$540,000 for R&D. A prototype system was designed, constructed and tested by Sandia. The prototype was installed in the Richland plutonium storage vault for operational evaluation. An evaluation report was published by Rockwell. Design deficiencies (prototype) will be addressed by Sandia in FY 1983.
- b. Conceptual design costs are estimated at \$120,000.
- c. Other project related costs are estimated at \$560,000 and include Rockwell support to the Sandia R&D efforts, preparation of the Environmental Evaluation, project management, radiation monitoring, vault access control and vault operations support.

B. Other related funding requirements

- 1. Facility Maintenance and operating costs are estimated at \$55,000 in FY 1987 and \$65,000 in FY 1988 and FY 1989 and include operational procedure preparation, spares, expendable materials, maintenance and software upgrades.
- 2. All programmatic operating expenses are included in b. (1) above.
- 3. No related Capital Equipment Not Related to Construction funding is requested.
- 4. No GPP or other construction funding is requested.

Department Of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Assistant Secretary for Defense Programs
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Fuel processing restoration,
Idaho Fuels Processing Facility,
Idaho National Engineering Laboratory, Idaho
(Partial Design Only) ^{a/}	2. Project No. 85-D-139
3. Date A-E Work Initiated: 1st Qtr. FY 1985	5. Previous Cost Estimate: None
3a. Date Physical Construction Starts: TBD ^{a/}	
4. Date Construction ends: TBD ^{a/}	6. Current Cost Estimate: \$10,000 ^{a/}
(Partial Design Only)
Date: 12/83

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 10,000 ^{a/}	\$ 10,000 ^{a/}	\$ 10,000 ^{a/}	\$ 3,000
1986	0	0	0	7,000

8. Brief Physical Description of Project:

The Idaho Fuels Processing Facility (IFPF) supports the nation's defense by processing Naval nuclear propulsion fuels and thus closes the Navy's fuel cycle while providing fuel for the Department of Energy's production reactors. The Navy has forecasted a 40-year mission for the IFPF which will increase its base processing load substantially beyond present capacity.

^{a/}Additional authorization and appropriation to be requested for remaining design funds and procurement/construction funds in FY 1986 budget submittal. Construction dates and total facility costs are to be determined (TBD) and will be provided in the FY 1986 budget submittal. See Section #10.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel processing restoration,
Idaho Fuels Processing Facility,
Idaho National Engineering Laboratory, Idaho
(Partial Design Only)

2. Project No. 85-D-139

8. Brief Physical Description of Project: (continued)

The Fuel Processing Restoration (FPR) project will replace portions of the deteriorated main processing facility solvent extraction systems with new facilities and process systems that will meet current codes and standards, and the demands of projected fuel processing loads. In addition the project will upgrade priority systems within the main processing plant. The resulting facilities will be designed to provide a minimum recovery rate of Uranium-235 per day to meet requirements, be capable of concurrent or sequential uranium recovery operation, have adequate intercycle and product storage or surge capacity to support concurrent or sequential modes, minimize personnel radiation exposures, minimize the spread of radioactive and chemical contamination, improve criticality safety, increase process availability, and minimize the release of radioactive effluents to the environment. The project will provide remote maintenance/replacement capabilities in those portions of the solvent extraction process which, due to high radiation hazards, decontamination time, and historically high maintenance requirements, cannot otherwise achieve the required process availability. Finally, the project will enable termination of the present practice of utilizing an injection well for the disposal of liquid service waste. After the FPR Project is completed, an alternate disposal system will receive a reduced volume of cleaner (ie, less contaminated chemically and radiologically) effluent from the recycle and cleanup systems of the IFPF provided by the FPR Project.

All new facilities, structures, and process cells provided by this project will be constructed of reinforced concrete, and will be arranged by process function. New cells will be designed to be compatible with existing cells (e.g., isolated and below grade), and constructed to optimize material flows, provide ready but controlled personnel access, optimize remote handling and maintenance capabilities, minimize overall floor area, and meet all credible natural phenomena design requirements. As necessary, the new facilities and process systems will include supporting systems including control rooms and control stations, health physics offices, electrical switchgear, maintenance areas, process make-up areas, chemical storage areas, and overhead bridge cranes and bridge-mounted manipulators. Additional cells and specified areas will also be provided for radioactive liquid waste handling systems, process and ventilation air supply and exhaust systems, and process sampling. A combination of remote and direct maintenance techniques will be employed in the new facilities. Direct maintenance equipment/areas will be limited to pipes, columns, tanks, and similar items not expected to require maintenance or replacement for many years. Remote maintenance/replacement will be provided for failure-prone items to aid in decontamination, replacement, and maintenance activities, thereby decreasing process down time, facility and process decontamination time, liquid and solid waste generation rates, and needless personnel radiation exposures. Remote maintenance areas will be provided with shielding windows for direct viewing; manipulators for remote handling and maintenance; and ports and hatches for access, TV viewing, the introduction of tools and specified equipment, and replacement of major items of equipment.

All efforts related to this project will incorporate the latest proven engineering and technology to ensure process reliability and availability, minimize the release of radioactive and chemical effluents to the environment, minimize personnel radiation exposure, assure criticality safety, increase throughput capacity, and improve solvent recovery

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel processing restoration,
Idaho Fuels Processing Facility,
Idaho National Engineering Laboratory, Idaho
(Partial Design Only)

2. Project No. 85-D-139

8. Brief Physical Description of Project: (continued)

capability. The entire process will incorporate improved security and safeguards systems, and improved sampling and accountability provisions.

The budget authority level requested in FY 1985 is for initiation of preliminary design activities.

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

403 The Idaho Fuels Processing Facility (IFPF) was designed and built in the early 1950's to demonstrate fuel processing technologies and to support DOE's Nuclear Materials Production Program. Using the techniques and standards existing at that time, the plant was built as a 5-year demonstration facility. However, it has operated successfully for 30 years as a production facility. Over the plant's operating years, many modifications and additions had to be made to provide a facility capable of safely meeting DOE's fuel processing needs. As a result, the plant continues to operate in a manner that ensures safety to plant personnel and the public. However, today's philosophy encourages: (a) further reductions in personnel radiation exposures to as-low-as-reasonably-achievable (ALARA) levels; (b) physical rather than administrative methods of preventing criticality; (c) improved cleanup and control of effluent releases; and (d) more intensified security and product accountability measures. In addition to these changes in philosophy, the most recent IFPF fuel receiving forecasts indicate IFPF's operating mission extending to at least the year 2028. These forecasts project not only a longer plant operating mission, but also dramatic increases in the plant's future fuel processing requirements. In order to meet these projections for processing fuel, the IFPF's average annual fuel processing must increase (by the year 1992) by a factor of three more than the plant has been able to accomplish recently. Thus, both the facility's operating availability and its reliability must be significantly increased. Without this project, and considering the IFPF's future fuel processing requirements, age, operating history, and contact maintenance requirements, assurance that plant availability and reliability will meet future programmatic requirements will prove very difficult, if not impossible. Therefore, design and construction of replacement facilities and systems are required.

To enable the IFPF to meet its identified mission, seven improvement objectives that the IFPF process systems and facilities must meet have been defined as: (1) provide safe and timely uranium recovery operations; (2) provide reduced criticality risks for long-term uranium recovery operations; (3) provide features that achieve as-low-as-reasonably-achievable (ALARA) radiation exposure to plant personnel; (4) provide fuel recovery structures, systems, and equipment that meet applicable natural phenomena standards, codes, and safety criteria; (5) provide systems to maintain radioactive and chemical releases to the environment at or below acceptable limits; (6) provide enhanced safeguards and security systems; and (7) provide flexible fuel processing capability. Recently, several IFPF processes have been replaced with new facilities and systems that meet these seven mission and improvement objectives. For example, the new FLUORINEL Dissolution and Storage Facility (Project 77-13-a) will provide the facilities and systems needed to meet projected fuel receiving, storage, and dissolution requirements. The recently commissioned New Waste Calcining Facility (NWCF) provides systems to safely solidify radioactive wastes. However, for the uranium recovery process systems and facilities between dissolution and calcination, little work has

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel processing restoration,
Idaho Fuels Processing Facility,
Idaho National Engineering Laboratory, Idaho
(Partial Design Only)	2. Project No. 85-D-139
9. Purpose, Justification of Need, and Scope of Project: (Continued)	

been performed to provide a long-term, highly reliable capability to recover uranium from dissolved irradiated fuels. In fact, detailed studies show that the collective performance of the uranium recovery systems is not capable of meeting IFPF's projected fuel processing loads.

Detailed studies of IFPF's operating, maintenance, and failure histories have revealed that the existing extraction and denitration systems continue trending towards more frequent equipment failures and contamination incidents. These conditions in turn lead to more frequent plant shutdowns, higher personnel radiation exposures, reduced fuel processing rates, more frequent contamination incidents, and higher contaminated waste generation rates. These conditions also lead to a more expensive and time consuming operation per unit of uranium recovered. Besides the effects of aging, the outdated design of the facility causes distinct operating problems. For example, criticality potentials exist because of the utilization of non-geometrically safe vessels. The use of non-geometrically safe vessels requires a Plant Protection System (PPS) and the use of a large number of administrative controls to reduce the potential for criticality. With the existing systems, uranium accountability is difficult and time-consuming to maintain, and requires process shutdown and sweepdown, which reduce process availability. In addition, the facility was not designed to meet today's security and safety requirements. Control of access to process areas and to process lines carrying special nuclear material (SNM) is difficult because of extensive operational manpower requirements for operation, radiation protection, and maintenance activities. Compliance with today's standards for SNM accountability, including the timely detection of theft or diversion, is difficult and costly in the current facilities.

Past IFPF practice has also included the disposal of large volumes (approximately 3,000,000 gallons per day) of service waste liquids to the aquifer through an IFPF injection well. The discharge liquids are normally relatively clean, but do contain small amounts of both chemical and radioactive waste. In the event of a "worst case" failure such as a process system heat exchanger tube failure, gross amounts of radioactive liquids could be discharged to the injection well. Recently, because of this release potential, serious and concerted efforts have been made on the local, State and national levels to eliminate the injection well and all liquid effluents released to the aquifer.

To correct the problems and conditions identified, the FPR project, with state-of-the-art engineering, would provide systems, facilities, and features that meet today's codes, standards, and requirements. Implementation of the FPR project is expected to yield significant savings in several areas including: a reduction in personnel radiation exposures of approximately 70 man-rem/yr; a reduction in major plant shutdowns; a reduction in the volume of contaminated liquid wastes generated; and a decrease of several hundred minor miscellaneous contamination incidents per year. For the IFPF to meet its improvement objectives and its defined operating mission, the FPR project is vitally needed to provide the necessary operating continuity and process reliability. A delay in the initiation of the FPR project beyond FY 1985 would be costly in terms of: the reduced amount of uranium processed; the increase in the number of equipment failures; the increase in the number of contamination occurrences; the increase in the number and extent of personnel radiation exposures; the increase in volume of decontamination and clean-up wastes generated; the increase in operating costs; and the increase in the project cost.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel processing restoration,
Idaho Fuels Processing Facility,
Idaho National Engineering Laboratory, Idaho
(Partial Design Only)

2. Project No. 85-D-139

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

In addition, the FPR project will include recycle or closed loop water cooling systems, chemical treatment and recycle systems, and effluent regeneration and reuse systems. Through these measures and systems, essentially all liquid effluent streams will be cleaned up, recycled, or reused to eliminate the needs for an injection well to dispose of liquid effluents. These systems will become an integral part of the FPR and will be designed and sized to integrate with other IFPF operating systems and facilities as well as the FPR.

10. Details of Cost Estimate: b/

	<u>Total Cost</u>
Engineering and Design Costs (Partial)	\$ 10,000
Total Project Cost (Partial Design Only)	<u>\$ 10,000</u>

11. Method of Performance:

Design will be awarded on the basis of technical evaluation. Construction, and procurement will be accomplished by prime contracts and/or subcontracts awarded on the basis of competitive bidding.

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

A. <u>Total Project Costs</u>	<u>Prior Years</u>	<u>FY-1985</u>	<u>FY-1986</u>	<u>Total</u>
1. Total Facility Cost (Partial Design Only, Outyears TBD)				
a) Construction Line Item	\$ 0	\$ 3,000	\$ 7,000	\$10,000
b) PE&D	0	0	0	0
c) Expense Funded Equipment	0	0	0	0
d) Inventories	0	0	0	0
Total Facility Costs	\$ 0	\$ 3,000	\$ 7,000	\$10,000

b/Partial design costs only. Based on a completed conceptual design and a partially completed advanced conceptual design, the total facility cost is approximately \$230,000,000. Details of cost estimate will be provided in FY 1986 budget submittal following the completion of advanced conceptual design and process optimization studies.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel processing restoration, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho (Partial Design Only) 2. Project No. 85-D-139

	<u>Prior Years</u>	<u>FY-1985</u>	<u>FY-1986</u>	<u>Total</u>
2. Other Project Costs				
a) R&D Necessary to Complete Construction	\$8,950	\$ 1,200	\$ 150	\$10,300
b) Other Project Related Costs	\$ 0	2,900	2,980	5,880
Total Other Project Costs	\$8,950	\$ 4,100	\$ 3,130	\$16,180
Total Project Costs	\$8,950	\$ 7,100	\$10,130	\$26,180

B. Other Related Funding Requirements

1. Facility Operating Costs	\$ 0*/year
2. Programmatic Operating Expenses Directly Related to the Facility	0*
3. Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility	0*
4. GPP or Other Construction Related to Programmatic Effort in the Facility	0*
5. Other Costs	0*
Total Other Related Annual Funding Requirements	\$ 0*

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

A. Total Project Costs

1. Total Facility Costs

- Construction Line Item - No narrative required
- PE&D - No narrative required
- Expense Funded Equipment - No narrative required
- Inventories - No narrative required.

*Operating costs and programmatic costs for the restored and/or new facilities will not change from that presently budgeted for the existing processing facility.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel processing restoration, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho (Partial Design Only)	2. Project No. 85-D-139
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2. Other Project Costs

a. R&D necessary to complete construction - Approximately \$900,000 has been expended on equipment and process research and development (R&D) activities. An additional \$500,000 will be needed to support the remaining R&D in FY 1985 and FY 1986. Through FY 1985, approximately \$8,900,000 will be spent on the conceptual design and advanced conceptual design efforts.

b. Other Project Related Costs - Approximately \$ 5,880,000 will be spent on project support (project engineering, design review, documentation, etc.), operator training and facility startup through FY 1986. Project support will extend through design, construction, and startup.

B. Other Related Funding Requirements

No incremental change in funding is required for programmatic operation of the restored facility.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Productivity and radiological improvements,
Feed Materials Production Center, Fernald, Ohio	2. Project No. 85-D-140
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None
3a. Date physical construction starts: 4th Qtr. FY 1985	6. Current cost estimate: \$47,000
Less amount for PE&D: 0
Net cost estimate: \$47,000
Date: 8/83
4. Date construction ends: 2nd Qtr. FY 1989	

7. Financial Schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
450	1985	\$ 6,000	\$ 6,000	\$ 6,000	\$ 1,200
	1986	15,000	15,000	15,000	17,800
	1987	20,500	20,500	20,500	22,000
	1988	5,500	5,500	5,500	5,800
	1989	0	0	0	200

8. Brief Physical Description of Project

This project provides for the replacement of equipment and systems to assure continued and safe operation of the Department of Energy's Feed Materials Production Center at Fernald, Ohio. This includes:

<u>Plant</u>	<u>Description</u>
2	Improved slag leach filtration and vacuum system relocated in the digestion area.
2	Improved method of loading, ventilation, and instrumentation for the metal dissolver.
2	Safe geometry continuous column digester for enriched materials with improvements in the areas of feeding and ventilation.
3	Revisions to the UO ₃ gulping, milling, sampling and packaging systems.
2/3	Improved Refinery instrumentation.
4	Improved feed controls and conveyor system for the fluid beds and talcum reactors.
4	Environmental and safety improvements for the Tank Farm.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Productivity and radiological safety improvements, Feed Materials Production Center, Fernald, Ohio

2. Project No. 85-D-140

8. Brief Physical Description of Project (cont'd)

- 4 Redesign and replacement of Fluid Bed Furnaces.
- 4 Modification to the HF off-gas system and the HF recovery system replacement.
- 4/5 General improvements in the material handling areas and a method for bulk handling when moving UF₄ from Plant 4 to Plant 5.
- 8 New oxidation furnaces for residues of 3 to 4% U-235, upgrade existing furnace for 1.25% U-235, replacement of a box furnace, and a mid-size mill.
- 8 Replace and upgrade rotary kiln.
- Plantwide Stack monitoring systems.
- 1 New drum washer with self-contained solids/liquid decant system.

FY 1985 funds will be used to initiate design, procurement, and construction.

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

453 Equipment and safety improvements are required at the Feed Materials Production Center (FMPC) to ensure the continued capacity to meet programmatic needs and increasingly stringent radiological and industrial safety requirements. The FMPC produces depleted and slightly enriched uranium for the nuclear material production reactors. The plant was built in the early 1950's and has had no substantial physical or technological renovation since that time. Consequently, it is becoming obsolete in areas such as control systems, power supplies, materials handling, and environment controls.

Much of the instrumentation for process control is outdated. Reliable instrumentation is essential for proper operation monitoring and for immediate detection of inadvertent uranium releases. New electronic systems with servomechanisms are required, particularly for the extraction process. Similarly, the ducting for the present UO₃ packaging system is such that dust losses sometimes occur and become airborne at transition sections between system components. Upgrading of the UO₃ handling system is required to assure product quality and to maintain ALARA levels for operating personnel.

Some basic process steps also need to be changed. For example, certain uranium residues can not currently be digested in nitric acid without excessive fuming and/or foaming. A more versatile digester will be provided which will overcome the fuming/foaming NO_x problems by restricting the feed and acid quantities.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Productivity and radiological safety improvements, Feed Materials Production Center, Fernald, Ohio

2. Project No. 85-D-140

10. Details of Cost Estimated ^{a/}	Item Cost	Total Cost
A. Engineering, design, and inspection costs for Titles I, II and III at approximately 20% of Item B.		\$ 6,500
B. Construction Costs		31,100
(1) Building modifications	\$ 700	
(2) Special facilities	21,100	
(3) Other structures	9,300	
Subtotal		37,600
C. Contingency @ approximately 25% of above cost		9,400
Total		\$47,000

11. Method of Performance

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

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

	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	Total
1. Total Facility Costs							
(a) Construction line item ..	\$ 0	\$ 1,200	\$17,800	\$22,000	\$ 5,800	\$ 200	\$47,000
(b) PE&D	0	0	0	0	0	0	0
(c) Expense funded equipment	0	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0	0
Total Facility Costs	\$ 0	\$ 1,200	\$17,800	\$22,000	\$ 5,800	\$ 200	\$47,000
2. Other Project Funding							
(a) R&D necessary to complete construction	\$ 660	\$ 0	\$ 0	\$ 0	\$ 0	0	\$ 660
(b) Other project related costs	0	0	0	0	0	0	0
Total Other Project Funding .	0	0	0	0	0	0	0
Total Project Funding	\$ 660	\$ 1,200	\$17,800	\$22,000	\$ 5,800	\$ 200	\$47,660

^{a/} Based on completed conceptual design

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Productivity and radiological safety improvements,
Feed Materials Production Center, Fernald, Ohio

2. Project No. 85-D-140

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

1. Total Project Funding

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

2. Other Project Funding

- (a) R&D necessary to complete - Includes \$180,000 developmental costs and \$480,000 conceptual design costs.
- (b) Other project related costs - None

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Department Of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Materials Production

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

1. Title and Location of Project: U ₃ O ₈ fuel tube facilities,
fuel preparation area
Savannah River, South Carolina	2. Project No. 85-D-142
3. Date A-E Initiated: 1st Qtr. FY 1985	5. Previous Cost Estimate: None
3a. Date Physical Construction Starts: 2nd Qtr. FY 1985	6. Current Cost Estimate: \$ 15,500
Less PE&D 0
4. Date Construction Ends: 1st Qtr. FY 1988	Net Cost Estimate: \$ 15,500
Date: 4/83

7. Financial Schedule:

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<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 8,000	\$ 8,000	\$ 8,000	\$ 1,600
1986	6,000	6,000	6,000	4,000
1987	1,500	1,500	1,500	8,900
1988	0	0	0	1,000

8. Brief Physical Description of Project:

This project will provide a new powder metallurgy (PM) addition for the production of enriched U₃O₈ billet cores. The addition will have about 7800 square feet of usable space, a connecting covered walkway to the existing building, and ventilation facilities. As currently conceived, the building addition would have exterior panel walls with steel framing. It will contain about 11 processing cabinets with appropriate radiation shielding, a uranium oxide storage vault, operating rooms to perform operations in the processing cabinets, a service area to maintain the processing equipment, two offices, men's and women's change rooms, and necessary service facilities.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: U₃O₈ fuel tube facilities,
fuel preparation area
Savannah River, South Carolina

2. Project No. 85-D-142

8. Brief Physical Description of Project:(Cont'd)

The PM process uses standard equipment such as balances, grinders, and jaw crushers to prepare material for blending and an isostatic press to form the cores. Special equipment will be designed to blend the material that is pressed into cores and to recover the reject tubes for recycle. Material handling equipment will be provided to assist the operators in moving the process containers inside the cabinets. A computer system will be used to maintain an inventory of process materials and calculate the proper mixture of uranium oxide, aluminum powder, and recycle material.

The heating and ventilating system will be designed to maintain the temperature and humidity conditions necessary for handling of the oxide and aluminum powders and to keep the uranium oxide from being released to the environment. Safety systems including nuclear incident monitors and fire detection/suppression systems will be installed. The FY 1985 funds will be used to initiate design and procurement.

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

The new PM process will replace the casting and machining process currently being used to produce fuel tubes for the SR reactors. Existing casting and machining equipment will be kept in service during construction and will then be removed upon start up of the PM process. As compared to casting and machining the PM process will reduce onsite and offsite fuel manufacturing costs, increase reactor productivity, reduce waste costs, and improve the working environment.

The latest economic study of the PM process versus the casting-machining process indicated that for an investment of \$15.5 million, the Investor's Method of Return is 23%. This is based on 1985 dollars using a 7% average escalation rate; expenditures of \$3.4 million for assembly redesign, \$0.7 million for startup costs, and a \$1.0 million capital item at Oak Ridge; and savings or credits of: \$7.5 million (savings) in Savannah River fuel manufacturing, \$15.8 million (savings) in waste disposal, \$11.6 million (savings) in enriched uranium reprocessing costs, and \$45.8 million (production credit) in Savannah River reactor operating costs.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: U₃O₈ fuel tube facilities,
fuel preparation area
Savannah River, South Carolina

2. Project No. 85-D-142

10. Details of Cost Estimate:^{a/}

		(Dollars in Thousands)	
Item		Item Cost	Total Cost
A. Engineering Design & Inspection at approximately 39.1% of Construction Costs, Item B			\$ 2,895
B. Construction Costs.....			7,395
(1) Improvements to Land.....		\$ 300	
(2) Buildings.....		2,260	
(3) Special Facilities.....		4,835	
(a) Equipment \$ 2,450			
(b) Pipe 350			
(c) Electrical 830			
(d) Instruments 1,205			
C. Design & Construction Liaison, Testing, Check and Acceptance.....			1,120
D. Removal Costs.....			570
Subtotal			<u>11,980</u>
E. Contingencies at approximately 29% of above costs.....			<u>3,520</u>
Total Project Cost.....			\$15,500

11. Method of Performance:

Design, construction, and procurement will be accomplished by the operating contractor, utilizing fixed-price subcontracts and awards on the basis of competitive bidding to the extent feasible.

^{a/} Based on completed conceptual design.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: U₃O₈ fuel tube facilities,
fuel preparation area
Savannah River, South Carolina

2. Project No. 85-D-142

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

A. Total Project Funding	Prior Years	FY 1985	FY 1986	FY 1987	FY 1988	Total
1) Total Facility Costs						
a. Construction Line Item.....	\$ 0	\$ 1,600	\$ 4,000	\$ 8,900	\$ 1,000	\$ 15,500
b) PE&D.....	0	0	0	0	0	0
c) Expense Funded Equipment....	0	0	0	0	0	0
d) Inventories.....	0	0	0	0	0	0
Total Facility Costs.....	0	\$ 1,600	\$ 4,000	\$ 8,900	\$ 1,000	\$ 15,500
2. Other Project Funding						
a) R&D Necessary to Complete Construction.....	350	\$ 50	\$ 0	\$ 0	\$ 0	\$ 400
b) Other Project-Related Costs.	0	0	0	0	0	0
Total Other Project Funding.	350	50	0	0	0	400
Total Project Funding.....	\$ 350	\$ 1,650	\$ 4,000	\$ 8,900	\$ 1,000	\$ 15,900

B. Total Related Funding Requirements (Estimated Life of Project: 50 Years)

	Annual Cost
1) Facility Operating Costs.....	1,200
2) Programmatic Operating Expense Directly Related to the Facility.....	0
3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility.....	0
4) GPP or Other Construction Related to the Programmatic Effort in the Facility.....	0
5) Other Costs.....	0
Total Related Annual Funding Requirements.....	\$ 1,200

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: U ₃ O ₈ fuel tube facilities, fuel preparation area Savannah River, South Carolina	2. Project No. 85-D-142
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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements:

A. Total Project Funding

1) Total Facility Costs

- a. Construction Line Item - No narrative required
- b. PE&D - None
- c. Expense Funded Equipment - None
- d. Inventories - None

2) Other Project Funding

- a. R&D - None
- b. Other Project-Related Costs - Conceptual design \$200,000 and Engineering Studies \$200,000

B. Total Related Funding Requirements

- 1) Facility Operating Costs - The first year's annual operating cost is estimated to be \$1,200,000 (1985 Dollars)
- 2) Programmatic Operating Expenses Directly Related to the Facility - None
- 3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility - None
- 4) GPP or Other Construction Related to Programmatic Effort - None
- 5) Other Costs - None

Department Of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Materials Production

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

1. Title and Location of Project: Uranyl nitrate to oxide conversion facility,
Savannah River, South Carolina
(Partial Design, Long-Lead Procurement,
and Site Preparation Only)
2. Project No. 85-D-145
3. Date A-E Initiated: 3rd Qtr. FY 1985
5. Previous Cost Estimate: None
- 3a. Date Physical Construction Starts: TBD b/
4. Date Construction Ends: TBD b/

6. Current Cost Estimate: \$ 1,800^{a/}
Less PE&D: 0
Net Cost Estimate: \$ 1,800^{a/}
Date: December 1983

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 1,800 ^{a/}	\$ 1,800 ^{a/}	\$ 1,800 ^{a/}	\$ 400
1986	TBD ^{b/}	TBD	TBD	1,400
1987	0	0	0	0
1988	0	0	0	0

a/ Estimated cost of FY 1985 funded activities only. Additional authorization and appropriation will be requested in FY 1986 and FY 1987 budgets to complete design and procurement and construct the facility. Total project cost figures will be available in the third quarter of FY 1984.

b/ To be determined.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project:	2. Project No. 85-D-145
Uranyl nitrate to oxide
conversion facility,
Savannah River, South Carolina
(Partial Design, Long-Lead Procurement,
and Site Preparation Only)	

8. Brief Physical Description of Project:

This project provides for partial design, long-lead procurement, and site preparation work on a new uranyl nitrate conversion facility at Savannah River, South Carolina, that will replace existing equipment and facilities at DOE's Oak Ridge Y-12 Plant. The new facility will be approximately 30,000 square feet in net area and will include processing equipment space, a storage vault, control rooms, men's and women's change rooms, administrative offices, and service areas. Processing equipment will consist of two parallel conversion lines; each made up of a dissolver, blending vat, ion exchange columns, resin dryers, resin calciners, and an off-gas handling system. Uranyl nitrate hexahydrate solutions from the Savannah River H Canyon will be blended with dissolved returns from the Idaho Chemical Processing Plant and the mixture passed through ion exchange resin to fix the uranium. The resin will then be dried and calcined forming U_3O_8 . A common evaporator will be used to recover nitric acid from both lines. Vacuum transfer and pneumatic conveying systems will be employed to transfer material between the various processing steps and tankage provided for interim storage.

Full consideration will be given to both environmental and personnel protection. All processing equipment will be housed in secondary enclosures to prevent the release of uranium. Glove boxes will be shielded, where necessary, to reduce radiation exposures. Vessels will be designed to be criticality safe. Fire detection and control systems will be provided throughout the building. A distributed control system (computer) will be installed to facilitate process and auxiliary operations.

The project will include those features necessary to ensure the security of the nuclear material being processed. Physical barriers and intrusion detection devices will be provided together with a separate computer for material accountability.

Electrical power will be extended to the facility from an existing primary substation. An emergency diesel generator will be installed for backup capability and an uninterruptible battery system provided for critical instrumentation and controls.

In addition to perimeter security fencing, site work will consist of lighting, roads, a parking area, and walkways.

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

The conversion of uranyl nitrate to uranium oxide is a principal step in the recovery of enriched uranium from discharged reactor fuel. Recovery of this material is highly cost effective in that over \$125 million per year of, otherwise required, feed material and separative work unit costs are avoided.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project:	Uranyl nitrate to oxide conversion facility, Savannah River, South Carolina (Partial Design, Long-Lead Procurement, and Site Preparation Only)	2. Project No. 85-D-145
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9. Purpose, Justification of Need for, and Scope of Project: (cont'd)

Conversion operations are presently performed in DOE's Y-12 Plant in Oak Ridge, Tennessee. The Y-12 facilities have been in use since 1959 and have reached the point where they are no longer capable of meeting the demands of continuous service. Existing processing equipment must be replaced and extensive system modifications made to reduce radiation exposure levels and improve nuclear materials accountability.

Cost-benefit analyses indicate that it will be cheaper to construct a new facility and centralize conversion operations at Savannah River than to attempt to upgrade the existing Y-12 facilities. Capital investment requirements will be slightly higher for the new Savannah River facility but this initial outlay will be paid back upon startup through transportation and processing savings of \$2 million to \$5.2 million a year.

The construction of a new facility at Savannah River also provides several important secondary benefits. It will allow cessation of over-the-road shipments of uranyl nitrate solution between Savannah River and Oak Ridge, thereby totally eliminating any possibility that a radioactive release could occur due to an in-transit accident or that operations could be halted by a truckers' strike. Under present operating conditions, the Savannah River H Canyon process can be maintained in operation for only a limited period of time if uranyl nitrate shipments are interrupted. It has been necessary to shut down the canyon process four times in the recent past due to such interruptions. With upcoming production increases, the number of shipments between sites would climb to over 230 a year, further increasing the likelihood of a shutdown due to transportation problems.

10. Details of Cost Estimate

Detailed cost estimate will be available in the third quarter of FY 1984. Current request is for partial design, long-lead procurement and site preparation only.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Uranyl nitrate to oxide conversion facility,
Savannah River, South Carolina
(Partial Design, Long-Lead Procurement,
and Site Preparation Only)

2. Project No. 85-D-145

11. Method of Performance

Design will be by the operating contractor. Construction and procurement will be by the operating contractor utilizing, to the extent feasible, fixed-price subcontracts awarded on the basis of competitive bidding.

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

	Prior Years	FY1985	FY1986	FY1987	FY1988	TOTAL
A. Total Project Funding						
1. Total Facility Costs						
a. Construction Line Item.....	\$ 0	\$ 400	\$ 1,400	\$ 0	\$ 0	\$ 1,800 a/
b. PE&D.....	0	0	0	0	0	0
c. Expense Funded Equipment....	0	0	0	0	0	0
d. Inventories.....	0	0	0	0	0	0
Total Facility Costs.....	\$ 0	\$ 400	\$ 1,400	\$ 0	\$ 0	\$ 1,800
2. Other Project Funding						
a. R&D.....	1,800	\$ 800	\$ 0	\$ 0	\$ 0	\$ 2,600
b. Other Project Related Cost..	600	750	1,500	1,400	0	4,250
Total Other Project Funding.	\$2,400	\$ 1,550	\$ 1,500	\$ 1,400	\$ 0	\$ 6,850
Total Project Funding.....	\$2,400	\$ 1,950	\$ 2,900	\$ 1,400	\$ 0	\$ 8,650

B. Total Related Funding Requirements (Estimated Life of Project is 30 years)

	Annual Cost
1) Facility Operating Costs	\$(1,970)
2) Programmatic Operating Expense Directly Related to the Facility.....	(3,250)
3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility	0
4) GPP or Other Construction Related to the Programmatic Effort in in the Facility.....	0
5) Other Costs.....	0
Total Other Related Annual Funding Requirements.....	\$(5,220)

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project:	Uranyl nitrate to oxide conversion facility, Savannah River, South Carolina (Partial Design, Long-Lead Procurement, and Site Preparation Only)	2. Project No. 85-D-145
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13. Narrative Explanation of Total Project Funding and Other Funding Requirements

A. Total Project Funding

1) Total Facility

- (a) Construction Line Item Funding - No narrative required.
- (b) PE&D - None
- (c) Expense Funded Equipment - None
- (d) Inventories - None

2) Other Project Funding

- (a) R&D necessary to complete - Includes \$800,000 conceptual design costs and \$1,800,000 for process development.
- (b) Other project related funding - A total of \$2,900,000 is expected to be spent for plant liaison starting during conceptual design. An additional \$1,350,000 is expected to be spent for preparation of safety analysis, environmental evaluation, operating procedures, training, and facility startup.

B. Total Related Funding Requirements

- 1) Facility Operating Costs - Average projected savings in labor, materials, services, and overhead as compared to continued use of existing Oak Ridge facility. Actual costs under each case would be \$3,600,000 at Savannah River versus \$5,570,000 at Oak Ridge.
- 2) Programmatic Operating Expenses Directly Related to the Facility - Average projected transportation savings as compared to continued use of Oak Ridge facilities. There will be no transportation costs with the new facility.
- 3) Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility - None.
- 4) GPP or Other Construction Related to Programmatic Effort to Sustain Viable Operations - None.
- 5) Other Costs - None.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Modification Processing
Facility Substations,
Savannah River, South Carolina	2. Project No. 84-D-130
3. Date A-E Work Initiated: 2nd Qtr. FY 1983 ^{a/}	5. Previous Cost Estimate: \$ 7,000
Less PE&D: 400
Net Cost Estimate: \$ 6,600
Date: 11/82
3a. Date Physical Construction Starts: 1st Qtr. FY 1984	
4. Date Construction Ends: 2nd Qtr. FY 1985	6. Current Cost Estimate: \$ 6,200 ^{b/}
Less PE&D: 400
Net Cost Estimate: \$ 5,800
Date: 12/83

7. Financial Schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1984	\$ 5,600	\$ 5,600	\$ 5,600	\$ 2,100
1985	200	200	200	3,700

8. Brief Physical Description of Project

This project expands the 251-F and H Area electrical substations and distribution systems that supply electricity for plutonium processing. The capacity of 251-F and 251-H substations will be increased to meet projected electrical demands resulting from expansion of production facilities in each area. This includes installation of replacement transformers of large capacity, enlarging electrical switchgear, and upgrading area process electrical feeders. The new system will utilize as many existing components as possible, including the substation control buildings.

^{a/} PE&D funded design.

^{b/} TEC decrease due to purchase of switchgear and H Area transformer with capital equipment funds.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Modification Processing
Facility Substations,
Savannah River, South Carolina

2. Project No. 84-D-130

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

The purpose of this project is to assure operational continuity of all production operations within the two separations areas by installing redundant electrical service of sufficient size to support increased production requirements within 200-F and 200-H areas. In order to avoid unplanned processing interruptions, the substations must be of sufficient capacity such that a single transformer can supply the total area requirements. The existing F Area and H Area substations contain two 9.4 MVA transformers in parallel. Currently during peak periods, the electrical demands (11 MVA in F Area and 12.5 MVA in H Area) exceed the rated capacity of a single transformer (9.4 MVA). Funding is required to assure completion of facilities in FY 1985 when the forecasted area load growth associated with ongoing and planned projects will exceed current full substation capacity (18.8 MVA). Without system upgrading the following situations will occur:

- o Area operational continuity would be jeopardized by routine events such as electrical system maintenance work. This situation occurs routinely twice each year in each separation area.
- o Program interruptions in excess of 6 months would be necessary to maintain area loads within the limits of the supply capability should failure occur in one of the existing transformers or associated switchgear.
- o New programs and/or facilities planned after FY 1985, which place additional electrical demands on the areas, will exceed substation capacity.

Upgrading of the 251-F and 251-H electrical supply systems will return the redundancy of feed characteristic to the electrical supply system in 200-F and 200-H areas for existing and anticipated future loads.

The funds requested in FY 1985 funds will be used to complete construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Modification Processing
Facility Substations,
Savannah River, South Carolina

2. Project No. 84-D-130

10. Details of Cost Estimate:^{c/}

<u>Item</u>	<u>Total Cost</u>
a. Engineering design and inspection at approximately 21% of construction costs, Item b.....	\$ 835 ^{d/}
b. Construction costs.....	4,004
c. Removal costs.....	506
Subtotal (Items a, b, and c).....	<u>5,345</u>
d. Contingencies at approximately 16% of above costs.....	<u>855</u>
Total estimated cost	\$6,200

^{c/}Based on completed conceptual design.
^{d/}Includes PE&D.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Modification Processing
Facility Substations,
Savannah River, South Carolina

2. Project No. 84-D-130

11. Method of Performance

Design will be performed by the operating contractor. Construction and procurement will be accomplished by the operating contractor, utilizing fixed-price subcontract awarded on the basis of competitive bidding.

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

A. Total Project Funding	Prior Years	FY 1984	FY 1985	Total
1. Total Facility Costs				
a. Construction Line Item.....	\$ 0	\$2,100	\$3,700	\$5,800
b. PE&D.....	260	140	0	400
c. Expense Funded Equipment.....	0	0	0	0
d. Inventories.....	0	0	0	0
Total Facility Costs.....	260	2,240	3,700	6,200
2. Other Project Funding				
a. R&D	145	0	0	145
b. Other Project Related Cost.....	0	2,200	0	2,200
Total Other Project Funding.....	145	2,200	0	2,365
Total Project Funding.....	\$ 405	\$4,440	\$3,700	\$8,545

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Modification Processing
Facility Substations,
Savannah River, South Carolina

2. Project No. 84-D-130

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

	Annual Cost
B. Total Related Funding Requirements (estimated life of project is 20 years)	
1. Facility Operating Costs.....	\$ 0
2. Programmatic Operating Expense Directly Related to the Facility.....	0
3. Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility.....	0
4. GPP or Other Construction Related to the Programmatic Effort in the Facility.....	0
5. Other Costs.....	0
Total Related Annual Funding Requirements.....	\$ 0

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

A. Total Project Funding

1. Total Facility

- Construction Line Item - no narrative required.
- PE&D - \$400,000 in FY 1983.
- Expense Funded Equipment - none.
- Inventories - none.

2. Other Project Funding

- R&D - A total of \$145,000 is expected to be spent for conceptual design and engineering studies associated with this project. No other R&D funds should be required.
- Other Project Related Costs - Procurement of replacement transformers and switchgear.

B. Total Related Funding Requirements

- Facility Operating Costs - none.
- Programmatic Operating Expenses Directly Related to the Facility - none.
- Capital Equipment Not Related to Construction - none.
- GPP or Other Construction Related to Programmatic Effort - none.
- Other Costs - none.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Modification Processing Facility Substations Savannah River, South Carolina	2. Project No. 84-D-130
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13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements (Continued)

- A. 2. Other Project Funding
 - a. R&D - A total of \$145,000 is expected to be spent for conceptual design and engineering studies associated with this project. No other R&D funds should be required.
 - b. Other Project Related Costs - Procurement of replacement transformers and switchgear.
- B. Total Related Funding Requirements
 - 1. Facility Operating Costs - none.
 - 2. Programmatic Operating Expenses Directly Related to the Facility - none.
 - 3. Capital Equipment Not Related to Construction - none.
 - 4. GPP or Other Construction Related to Programmatic Effort - none.
 - 5. Other Costs - none.

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Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Safeguards and security improvements, Plantwide,
Savannah River, South Carolina	2. Project No. 84-D-134
3. Date A-E work initiated: 3rd Qtr. FY 1984	5. Previous Cost Estimate: None
3a. Date Physical Construction Starts: 1st Qtr. FY 1985	
4. Date Construction Ends: 3rd Qtr. FY 1988 ^{a/}	6. Current Cost Estimate: \$47,800 ^{a/}
Less PE&D 0
Net Cost Estimate: \$47,800
Date: 8/83

7. Financial Schedule

	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
401	Proposed 1984 Supplemental	\$12,000	\$12,000	\$12,000	\$ 3,200
	1985	14,900	14,900	14,900	7,000
	1986	20,900	20,900	20,900	16,800
	1987	0	0	0	14,000
	1988	0	0	0	6,800

8. Brief Physical Description of Project:

This project provides for plantwide safeguards and security improvements to existing Savannah River facilities for the prevention and detection of diversion and/or theft of Special Nuclear Material (SNM). Facility improvements will also be directed toward the prevention of radiological and industrial sabotage and the denial of unauthorized access to equipment, material, and sensitive information. The project will encompass production, research and development, and support facilities throughout the Savannah River complex.

^{a/} Preliminary estimates based on past experience for similar installations. Definitive figures will be provided after completion of engineering studies.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security improvements, Plantwide,
Savannah River, South Carolina	2. Project No. 84-D-134

8. Brief Physical Description of Project: (Cont'd)

a. Physical Security Facilities Improvements

Physical security facilities improvements will include replacement of outmoded alarm systems, additions to, or upgrading of existing alarm systems, and new systems to enhance reporting and assessment of intrusion alarms. New fences will be installed and fence and street lighting added. Closed Circuit Television (CCTV) monitoring will be expanded and the use of video switches in selected areas will augment the existing system. Improvements would also be made in the areas of plant perimeter barricades and vehicle gate barriers. Computerized personnel access control will be instituted in key areas to provide positive identity checking.

b. Materials Control and Accountability Facilities (MC&A) Improvements:

Several improvements to the MC&A facilities and systems are planned. Included is the maintenance of control limits through an automated near-real-time accountability system installed in each SNM facility allowing for accounting and detection of SNM within a 24-hour period. The accuracy of measurements will be improved through installation of state-of-the-art instrumentation and analytical techniques designed to input the automated accounting system from non-destructive assay (NDA) measurement, wet chemistry analysis, and more precise analytical instrumentation. In addition to interfacing the measurement systems to the automated data processing, SNM vault surveillance systems upgraded. Equipment to be installed on this project also include process tankage measurement devices and National Bureau of Standards calibrated vessels to improve process quantity measurements and, therefore, reduce their contribution to total inventory differences. NDA equipment for confirmatory measurements of SNM receipts, shipment, and transfers to waste will be included with these improvements. Also, included with these improvements will be the implementation of recommendations from diversion path analyses, (including building modifications/additions to relieve overcrowded conditions, provide space for waste storage and new NDA equipment and improve material and personnel control).

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Safeguards and security improvements, Plantwide,
Savannah River, South Carolina	2. Project No. 84-D-134
-

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

Special nuclear materials are received, processed, fabricated, transported, stored, and analyzed at the Savannah River Plant. The threat exists for diversion of these materials from personnel both outside and inside the complex and actions are necessary to counter the range of adversary threat levels facing the Savannah River Plant.

The phased takeover of the existing Savannah River security mission by an independent guard force contractor beginning in FY 1983 will provide increased response capability. In light of this re-direction in Savannah River security operation, new security equipment purchases will be required to sustain the new security contractor's ability to meet all identified threats.

A safeguards system must provide adequate protection against unauthorized access to or removal of strategic special nuclear material (SNM) and detect covert removal with adequate time to respond. New equipment, facilities, and systems to improve the quality and timeliness of accountability measurements is necessary at SRP to ensure compliance with DOE Orders, improve existing detection response time, and more accurately account for SNM inventories (i.e., reduce inventory differences). Safeguards includes the Materials Control and Accountability (MC&A) function which is the timely indication of possible diversion or credible assurances by audits and inventory verification that no diversion of SNM has occurred. In order to assure maximum effectiveness, an MC&A system shall be capable of diversion detection within 24 hours. As a result of the systems and equipment to be implemented by this project, each SNM facility is to be fully capable to readily retrieve accountability data by material balance area (MBA) which reflects the quantities of SNM which have been received, shipped, or otherwise removed from the MBA and remaining quantities on inventory with entries capable of being updated daily.

The FY 1985 funding being requested will be used to continue design and procurement efforts initiated under the proposed FY 1984 supplement and begin construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security improvements, Plantwide,
Savannah River, South Carolina

2. Project No. 84-D-134

10. Details of Cost Estimate^{a/}

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at approximately 26% of construction costs, item b	\$	\$ 7,980
b. Construction costs		30,260
1. Improvements to land. (Fences and gates/excavation and grading)	11,040	
2. Building, Housing for NDA equipment, hardened guard posts, vaults, improved material control modifications	15,830	
3. Special facilities Physical Security (Including SNM/metal detectors, portal monitors, alarm systems, CCTV) Material Control and Accountability (Including NDA equipment, computers, software, analytical equipment, terminals, sensors) Subtotal	3,390	
c. Contingency at approximately 25% of above costs		9,560
Total estimated cost		\$47,800

11. Method of Performance

Design, procurement, and construction will be by the operating contractor. Subcontracting will be by competitive bidding.

^{a/} Preliminary estimate based on a past experience for similar installations. Definitive figures will be provided after completion of engineering studies.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security improvements, Plantwide,
Savannah River, South Carolina

2. Project No. 84-D-134

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

	<u>Prior Years</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>Total</u>
A. Total Project Costs							
1. Total Facility Cost							
(a) Construction Line Item	\$ 0	\$ 3,200	\$ 7,000	\$16,800	\$14,000	\$ 6,800	\$47,800
(b) PE&D	0	0	0	0	0	0	0
(c) Expense Funded Equipment	0	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0	0
Total Facility Costs	\$ 0	\$ 3,200	\$ 7,000	\$16,800	\$14,000	\$ 6,800	\$47,800
2. Other Project Costs							
(a) Conceptual design and studies ..	900	0	0	0	0	0	900
(b) Other Project Related Costs	1,509	1,760	1,006	755	0	0	5,030
Total Other Project Costs	2,409	1,760	1,006	755	0	0	5,930
Total Project Costs (Items 1.... and 2)	\$ 2,409	\$ 4,960	\$ 8,006	\$17,555	\$14,000	\$ 6,800	\$53,730
B. Other Related Funding Requirements							
1. Facility Operating Costs				\$2,000			
2. Programmatic Operating Expenses Directly Related to the Facility				0			
3. Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility				400			
4. GPP or Other Construction Related to Programmatic Effort in the Facility				0			
5. Other Costs				0			
Total Other Related Annual Funding Requirements				\$2,400			

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Safeguards and security improvements, Plantwide,
Savannah River, South Carolina

2. Project No. 84-D-134

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

A. Total Project Costs

1. Total Facility

- a. Construction Line Item - no narrative required.
- b. PE&D - none
- c. Expense Funded Equipment - none
- d. Inventories - none

2. Other Project Costs

- a. Conceptual Design- Includes \$200,000 for preparation of basic data necessary to provide input for estimating and project scope of work.
- b. Other Project Related Funding - none

B. Other Related Funding Requirements

- 1. Facility Operating Costs - This cost is a proportion of the total cost of operating the safeguards and security systems necessary to protect the Plant Site on a 24 hour, 7 day a week basis.
- 2. Programmatic Operating Expenses Directly Related to the Facility - none
- 3. Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility - Includes equipment replacement on a normally expected frequently to continue viable systems operation.
- 4. GPP or Other Construction Related to Programmatic Effort - none
- 5. Other Costs - none

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Enriched uranium conversion facility modifications,
Y-12 Plant, Oak Ridge, Tennessee	2. Project No: 84-D-136
3. Date A-E Work Initiated: 2nd Qtr. FY 1984	5. Previous Cost Estimate: None
3a. Date Physical Construction Starts: 4th Qtr. FY 1985	6. Current Cost Estimate: \$20,600
Date: 12/83
4. Date Construction Ends: 2nd Qtr. FY 1988	

7. Financial Schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
487	Proposed 1984 Supplemental	\$ 4,400	\$ 4,400	\$ 4,400	\$ 2,000
	1985	8,000	8,000	8,000	6,000
	1986	8,200	8,200	8,200	7,000
	1987	0	0	0	4,700
	1988	0	0	0	900

8. Brief Physical Description of Project

Reactivation of the existing dry chemistry facility in the Oak Ridge Y-12 Plant will require extensive refurbishment and restoration. This system is used to convert enriched uranium hexafluoride (UF₆) to uranium tetrafluoride (UF₄) by hydrogen reduction. In addition to the complete disassembly of all major components of the facility including control instrumentation and ancillary systems for the purpose of inspection to verify functionality as well as the replacement of defective, deteriorated, and nonfunctional equipment, it will be necessary to apply modifications to the system to ensure compliance with EPA, safeguards, and safety regulations.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium conversion facility modifications, Y-12 Plant, Oak Ridge, Tennessee
2. Project No: 84-D-136

8. Brief Physical Description of Project (cont'd)

Major items presently expected to require replacement are listed as follows: reduction reactors, product powder collection hoppers, primary and secondary filter systems, cylinder receiving scale, cylinder feed manifold, product powder take-off gloveboxes, flow control valves, differential pressure transmitters, pressure recorder/controllers, thermocouples, 3-way solenoid valves, temperature transmitters, heater controls, temperature recorders, and strip heaters in the heated housings. Items to be refurbished include: the vacuum cleaning system, the cold trap station, the fire protection sprinkler system, and all manual valves. New systems to be provided include: sound attenuation for a vibrator system, a new dock and fluoride cylinder manifold, a new connecting network to tie critical alarms to the Plant Monitoring System, a new process control console, a new system for hydrogen and fluoride monitoring, new hydrogen fluoride vent gas treatment system, an enriched uranium accountability satellite computer with associated terminal equipment for output to the existing Y-12 central accountability system, and a personnel and emergency evacuation stairwell from the mezzanine. The project scope may include, but will not be limited to, the above listed items. The remaining facilities and equipment in the dry chemistry system will be dismantled and inspected, and any subsequent replacement or refurbishment will be based upon observed condition.

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

Renovation of this facility is required to provide a capability to increase the inventory of enriched uranium useful to the DOE's defense program activities. This facility which was used for this purpose until FY 1964 needs renovation to restore physical deterioration and accommodate modern safeguards and environmental concerns. The renovation proposed here will provide conversion capabilities and capacities to satisfy the projected requirements.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium conversion facility modifications, Y-12 Plant, Oak Ridge, Tennessee 2. Project No: 84-D-136

10. Details of Cost Estimate^{a/}

	<u>Item Cost</u>	<u>Total Cost</u>
A. Engineering, design and inspection at about 21% of construction costs,		
Item B	\$	\$ 2,980
B. Construction Costs		14,080
(1) Buildings		
(a) Other, new buildings	1,240	
(b) Building modification and addition	1,440	
(2) Special facilities	11,400	
C. Standard Equipment		100
Subtotal		17,160
E. Contingency at approximately 20% of above costs		3,440
Total Project Cost		\$20,600

11. Method of Performance

To the extent feasible, design will be on the basis of a negotiated A-E contract; however, some of the items may be more appropriate for operating contractor design. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bids.

^{a/} Based on completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium conversion facility modifications, Y-12 Plant, Oak Ridge, Tennessee

2. Project No: 84-D-136

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

	Prior Years	FY 1984	FY 1985	FY 1986	FY 1987	FY 1988	Total
A. Total Project Funding							
(1) Total Facility Costs							
(a) Construction Line Item	\$ 0	\$ 2,000	\$ 6,000	\$ 7,000	\$ 4,700	\$ 900	\$20,600
(b) PE&D	0	0	0	0	0	0	0
(c) Expense Funded Equipment	0	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0	0
Total Facility Costs	\$ 0	\$ 2,000	\$ 6,000	\$ 7,000	\$ 4,700	\$ 900	\$20,600
(2) Other Project Funding							
(a) R&D Necessary to Complete Construction..	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
(b) Other Project Related Costs	255	500	0	0	0	0	755
Total Other Project Funding	255	500	0	0	0	0	755
Total Project Funding	\$ 255	\$ 2,500	\$ 6,000	\$ 7,000	\$ 4,700	\$ 900	\$21,355
B. Total Related Funding Requirements							
(1) Facility Operating Costs						\$1,050	
(2) Programmatic Operating Expenses Directly Related to the Facility						2,450	
(3) Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility						0	
(4) GPP or Other Construction Related to Programmatic Effort in the Facility						0	
(5) Other Costs						0	
Total Other Related Annual Funding Requirements						\$3,500	

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Enriched uranium conversion facility modifications, Y-12 Plant, Oak Ridge, Tennessee 2. Project No: 84-D-136

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

A. Total Project Funding

(1) Total Facility

- (a) Construction Line Item Funding
- (b) PE&D Funding not Required for Titles I and II - not applicable.
- (c) Expense Funded Equipment - not applicable.
- (d) Inventories - not applicable.

(2) Other Project Funding

- (a) R&D Necessary to Complete - not applicable.
- (b) Other Project Related Funding - Conceptual Design Report (completed at a cost of \$255,000), design criteria, project and contract management plans, and quality assurance and safety plans.

B. Total Related Funding Requirements

- (1) Facility Operating Costs - \$1,050,000. Includes utilities, janitorial services, related materials and supplies and overhead. The overhead allocation is \$305,000.
- (2) Programmatic Operating Expense Directly Related to the Facility - \$2,450,000. Includes direct labor, fringes, production materials, supplies, and overhead. The overhead allocation is \$710,000.
- (3) Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility to Maintain Viable Facilities - none.
- (4) GPP or Other Construction Related to Programmatic Effort to Sustain Viable Operations - none.
- (5) Other Costs - none.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET SUBMISSION

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Facility Security Systems Upgrade, Idaho Fuels Processing Facility (IFPF), INEL, Idaho	2. Project No: 84-D-137
3. Date A-E Work Initiated: 4th Qtr. FY 1984 ^{a/}	5. Previous Cost Estimate: None
Date:
3a. Date Physical Construction Starts: 3rd Qtr. FY 1985 ^{a/}	6. Current Cost Estimate: \$10,000
Less amount for PE&D: 0
Net cost estimate: \$10,000
Date: 12/83
4. Date Construction Ends: 1st Qtr. FY 1987 ^{a/}	

7. Financial Schedule					
	Fiscal Year	Authorizations	Appropriations	Obligations	Costs
403	Proposed 1984 Supplemental	\$ 2,000 ^{a/}	\$ 2,000 ^{a/}	\$ 2,000 ^{a/}	\$ 200
	1985	8,000	8,000	8,000	5,900
	1986	0	0	0	3,000
	1987	0	0	0	900

8. Brief Physical Description of Project

This project will provide plant perimeter and internal facility security system improvements or delay mechanisms needed for compliance with recent planning guidance on special nuclear material (SNM) theft and sabotage protection. It does not duplicate currently authorized upgrade actions, rather this project provides additional protection against both the insider and outsider threats. The project will include items such as additional plant perimeter hardening; construction or modification and equipping of hardened entry control points; associated access or patrol roads; plant-related alarm and assessment systems; vehicle monitoring capabilities; uninterruptible power systems; redundant capabilities for critical systems subject to single point failures; internal material access or vital area hardening; improved access control systems at critical locations; intrusion alarms, surveillance and communications equipment; hardened guard stations; and barriers or positive delay mechanisms. The project will investigate and evaluate alternative approaches to achieving the required SNM theft and/or vital facility sabotage protection measures to assure the end result satisfies current regulations/guidelines, and retains effective operational capabilities.

^{a/} Assumes FY 1984 supplemental funding request is approved.

CONSTRUCTION PROJECT DATA SHEET

-
1. Title and location of project: Facility Security Systems Upgrade, Idaho Fuels Processing Facility (IFPF), INEL, Idaho	2. Project No: 84-D-137
-

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

A long-range program to achieve an effective, balanced IFPF safeguards and security system has been in progress for several years. System improvements to date were designed to meet previously established requirements. Because of proposed new threat guidance, an independent study of the overall IFPF security system was completed recently. This study, conducted by Sandia National Laboratories, was designed to assess the effectiveness of existing security systems (including funded or authorized improvements as provided by project 82-D-128, Plant Perimeter Security Systems Upgrade) and identify specific special nuclear material (SNM) theft or sabotage threat related system improvements. This project is based on the recommendations of that study and is consistent with the hardware requirements of recent DOE theft and sabotage threat planning guidance entitled "Generic Threat to DOE Nuclear Programs and Facilities". The requested improvements are necessary for continued compliance with Department of Energy Orders pertaining to the physical protection of special nuclear materials (SNM). The resulting system must detect, and to the extent possible, prevent or deter SNM theft and sabotage related adversary actions and provide the timely warning and interpretation capabilities necessary to effectively counter all anticipated actions. Completion of this and other ongoing or planned projects, together with proposed administrative and procedural changes, should provide the capabilities required for compliance with current regulations and guidelines.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Facility Security Systems Upgrade, Idaho Fuels Processing Facility (IFPF), INEL, Idaho

2. Project No: 84-D-137

10. Details of Cost Estimate^{a/}

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at 21% of construction cost, item b.		\$ 1,300
b. Construction cost		6,100
1. Improvements to land: fencing, roads, etc.	\$2,300	
2. Building/Structures	620	
3. Special Facilities	560	
4. Utilities	2,620	
c. Standard equipment (to be designed for remote control operations)		510
d. Demolition and removals		90
Subtotal		\$ 8,000
e. Contingency at approximately 25% of above costs		2,000
Total estimated costs		\$10,000

11. Method of Performance

Design will be accomplished by negotiated architect-engineer contract and construction and procurement by contracts awarded on the basis of competitive bids, except for alarm equipment which will be Government Furnished Equipment (GFE).

^{a/}Cost estimate based on a completed conceptual design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Facility Security Systems Upgrade, Idaho Fuels Processing Facility (IFPF), INEL, Idaho

2. Project No: 84-D-137

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

	<u>Prior Years</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>Total</u>
A. Total Project Costs						
1. Total Facility Costs						
(a) Construction Line Item	\$ 0	\$ 200	\$5,900	\$3,000	\$ 900	\$10,000
(b) PE&D	0	0	0	0	0	0
(c) Expense Funded Equipment	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0
Total Facility Costs	\$ 0	\$ 200	\$5,900	\$3,000	\$ 900	\$10,000
2. Other Project Costs						
(a) R&D necessary to complete construction	\$ 370	\$ 0	\$ 0	\$ 0	\$ 0	\$ 370
(b) Other project related costs	300	110	210	210	100	930
Total Other Project Costs	\$ 670	\$ 110	\$ 210	\$ 210	\$ 100	\$ 1,300
Total Project Costs	\$ 670	\$ 310	\$6,110	\$3,210	\$1,000	\$11,300
B. Other Related Funding Requirements						
1. Facility Operating Costs					\$ 160	
2. Programmatic Operating Expenses Directly Related to the Facility					0	
3. Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility					0	
4. GPP or Other Construction Related to Programmatic Effort in the Facility					0	
5. Other Costs					0	
Total Other Related Annual Funding Requirements					\$ 160	

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Facility Security Systems Upgrade, Idaho Fuels Processing Facility (IFPF), INEL, Idaho 2. Project No: 84-D-137

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

A. Total Project Costs

1. Total Facility

- a. Construction Line Item - no narrative required.
- b. PE&D - no narrative required.
- c. Expense Funded Equipment - no narrative required.
- d. Inventories - no narrative required.

2. Other Project Costs

- a. R&D Necessary to Complete - approximately \$370,000 has been spent for conceptual design.
- b. Other Project Related Costs - approximately \$930,000 will be spent for project support during design and construction and for testing and startup of the completed facility.

B. Other Related Funding Requirements

It is estimated the facilities will be used 25 years for their programmatic purposes.

- 1. Facility Operating Costs - facility operating costs amount to \$30,000 annually for maintenance and approximately \$130,000 annually for additional guard service.
- 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 Programmatic Effort - no narrative required.
- 5. Other Costs - no narrative required.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Water pollution control, Feed Materials
Production Center, Fernald, Ohio

2. Project No: 83-D-146

3. Date A-E work initiated: 2nd Qtr. FY 1982 (PE&D)

5. Previous cost estimate: \$ 9,700
Less amount for PE&D: 200
Net cost estimate: \$ 9,500
Date: 2/82

3a. Date physical construction starts: 4th Qtr. FY 1983

4. Date construction ends: 4th Qtr. FY 1986

6. Current cost estimate: \$ 9,700
Less amount for PE&D: 200
Net cost estimate: \$ 9,500
Date: 12/83

7. Financial Schedule

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1983	\$1,400	\$1,400	\$1,398	\$ 202
1984	4,000	4,000	4,002	1,864
1985	4,100	4,100	4,100	4,400
1986	0	0	0	3,034

8. Brief physical description of project

This project will provide facilities at the Feed Materials Production Center (FMPC) at Fernald, Ohio, to achieve compliance by July 1, 1986, with the objectives established in the Federal Water Pollution Control Act of 1972, as amended by the Clean Water Act of 1977 for "Best Available Technology Economically Achievable" (BATEA).

The pollutants of primary concern are nitrates, ammonia, chlorides, suspended solids, and the pH of the coal pile drainage. The project includes the following:

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of project: Water pollution control, Feed Materials
Production Center, Fernald, Ohio

2. Project No: 83-D-146

8. Brief physical description of project (cont'd)

A facility to treat the effluent stream from the General Sump and the Clearwell. This stream is made up of neutralized effluents from all Process Plants, Water Treatment Plant, and the Boiler Plant blowdown. The facility will consist of a denitrification system, a holding lagoon, transfer pumps, piping, and pumping station buildings to accommodate a biological degradation of nitrate and ammonia ions.

A facility to impound and settle all rainwater falling within the production area of FMPC. The facility will consist of a lagoon to hold for recycle to the General Sump any inadvertent chemical spill within the production area, a settling basin for rainwater retention and suspended solids reduction, and necessary pumping station to transfer the settling basin effluent to the sewage plant for final disposition.

A facility at the Boiler Plant-Water Plant complex for the collection and primary treatment of acidic water drainage from the Boiler Plant coal pile. A collection trench system, sump, neutralization bed, and pumps for transferring the effluent to the General Sump will be provided.

An alternate disinfection system to replace the existing chlorination system, thus reducing the chlorine residuals from the sewage treatment plant effluent.

FY 1985 project funds will be used to continue construction and associated Title III engineering efforts.

9. Purpose, justification of need for, and scope of project

Facilities proposed in this project are required to comply with the Federal Water Pollution Control Act as amended by the Clean Water Act and Federal and State Water Quality Standard Requirements for Surface Streams, and to make corrections towards complying with the Toxic Substances Control Act. The present National Pollutant Discharge Elimination System (NPDES) permit under which the FMPC is operating was issued in November 1980, and will continue in effect until July 1984, when BATEA effluent limitations will be imposed. The facilities and systems required for treatment of effluents for the BATEA limitations do not currently exist at the FMPC and must be provided.

Alternatives

There are no practicable alternatives to this project.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Water pollution control, Feed Materials Production Center, Fernald, Ohio

2. Project No: 83-D-146

10. Details of Cost Estimate ^{a/}	Item Cost	Total Cost
a. Engineering, design and inspection costs for partial Titles I and II and total Title III.....		\$ 1,520 ^{b/}
b. Construction Costs.....		6,600
(1) Improvements to land.....	\$1,700	
(2) Buildings.....	150	
(3) Other Structures.....	150	
(4) Special Facilities.....	4,600	
c. Standard Equipment.....	0	0
Subtotal.....		\$8,120
d. Contingency at approximately 20% of above costs.....		1,580
Total Project Cost.....		\$9,700

11. Method of Performance

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

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

	Prior Years	FY 1983	FY 1984	FY 1985	FY 1986	Total
A. Total Project Funding						
(1) Total Facility Costs						
(a) Construction line item	\$ 0	\$ 202	\$1,864	\$4,400	\$3,034	\$9,500
(b) PE&D	200	0	0	0	0	200
(c) Expense funded equipment	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0
Total Facility Costs	200	202	1,864	4,400	3,034	9,700

^{a/} Based on completed conceptual design and PE&D efforts.
^{b/} Includes \$200,000 in PE&D funds.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Water pollution control, Feed Materials
Production Center, Fernald, Ohio

2. Project No: 83-D-146

12. Funding Schedule of Project Funding and Other Related Funding Requirements (cont'd)

	<u>Prior Years</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>Total</u>
(2) Other Project Funding						
(a) R&D necessary to complete construction	0	0	0	0	0	0
(b) Other project related costs	60	0	0	0	0	60
Total Other Project Funding	60	0	0	0	0	60
Total Project Funding	\$ 260	\$ 202	\$1,864	\$4,400	\$3,034	\$9,760

B. Total related annual funding requirements

(1) Facility operating costs	\$ 782
(2) Programmatic operating expenses directly related to the facility	0
(3) Capital equipment not related to construction but related to the programmatic effort in the facility	0
(4) GPP or other construction related to the programmatic effort in the facility	0
(5) Other Costs	0
Total other related annual funding requirements	\$ 782

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

A. Total Project Funding

- (1) Total Facility
 - (a) Construction line item funding - no narrative required.
 - (b) PE&D - FY 1981.
 - (c) Expense funded equipment - none.
 - (d) Inventories - none.
- (2) Other Project Funding
 - (a) R&D necessary to complete - none.
 - (b) Other project related costs - conceptual design engineering \$60,000.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Water pollution control, Feed Materials
Production Center, Fernald, Ohio

2. Project No: 83-D-146

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements (cont'd)

B. Total Related Funding Requirements

- (1) Facility operating costs - Includes \$34,000 for maintenance, \$33,000 for operating personnel, and \$715,000 for chemicals; all in FY 1984 dollars.
- (2) Programmatic operating expenses - none.
- (3) Capital equipment - none.
- (4) GPP or other construction - none.
- (5) Other costs - none.

14. Incorporation of Fallout Shelters in Future Federal Buildings

67 The project does not include the construction of new buildings or building additions; therefore, the provisions for fallout
63 shelters is not applicable.

15. Incorporation of Measures for the Prevention, Control and Abatement of Environmental Pollution by Federal Facilities

The total cost of the project includes the cost of any measures necessary to assure compliance with the requirements of known Federal and state regulations.

16. Evaluation of Flood Hazards

This project will be located in an area not subject to flooding, determined in accordance with Executive Order 11988.

17. Compliance with the National Environmental Policy Act, Floodplain/Wetlands Environmental Review Requirements, and Other Related Statutes

An environmental assessment document for utilization in the compliance determination process was furnished to the DOE-Headquarters Program Office in September 1981. This project is not located in a floodplain or wetlands and no wetlands assessment will be made.

18. Accommodations for Handicapped Persons

Design of this project will be in accordance with the Architectural Barriers Act, Public Law 90-480, and implementing instructions in the Federal Property Management Regulations (41 CFR 101-91.6).

Department Of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and Location of Project: Pollution discharge elimination,
Savannah River, South Carolina

2. Project No. 83-D-147

3. Date A-E Work Initiated: 2nd Qtr. FY 1983^{a/}

5. Previous Cost Estimate: \$10,000
Less PE&D 350
Net Cost Estimate \$ 9,650
Date: 12/82

3a. Date Physical Construction Starts: 2nd Qtr. FY 1984

6. Current Cost Estimate: \$10,000
Less amount for PE&D 350
Net Cost Estimate: \$ 9,650
Date: 2/83

4. Date Construction Ends: 4th Qtr. FY 1986

7. Financial Schedule:

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
C7	1983	\$ 1,000	\$ 1,000	\$ 1,000	\$ 0
C7	1984	2,000	2,000	2,000	1,400
C7	Proposed 1984 Supplement	3,500	3,500	3,500	1,500
	1985	2,150	2,150	2,150	2,500
	1986	1,000	1,000	1,000	4,250

8. Brief Physical Description of Project

This project provides facilities to control suspended solids and undesirable chemicals in aqueous effluents from Savannah River's (SR's) major powerplants and other items needed for accelerating environmental clean-up at SR. At the P, K, H, and A Area, powerplant waters containing chemicals or ash and coal dust in suspension will be segregated and diverted to retention basins. Necessary equipment will be installed to adjust the pH of rain water runoff from the coal piles in these areas and bring releases within required acidity limitations. New ash basins will be constructed at the H and P

a/ PE&D funded design

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Pollution discharge elimination,
Savannah River, South Carolina

2. Project No. 83-D-147

8. Brief Physical Description of Project (Cont'd)

areas and ash disposal facilities provided at the G Area. M Area drainage will be redirected to allow the removal of chlorocarbons from an existing seepage basin and its surrounding groundwaters. Curbs and dikes will be provided at the D, G, F, and H Areas to confine oil spills and a storage area built in the A Area to hold potential hazardous substances. Shutdown of production facilities will not be required for installation of the control features.

The FY 1985 funds will be used to continue design and continue construction.

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

The facilities this project provides are necessary to control liquid effluents within the requirements of the National Pollutant Discharge Elimination System (NPDES) permit SC0000175 issued under the Federal Water Pollution Control Act of 1972 in accordance with Executive Order 12088, Incorporation of Measures for Prevention, Control and Abatement of Air and Water Pollution at Federal Facilities.

The mandates of the Clean Water Act require the control of point sources of pollution reaching surface waters. Compliance with these mandates is aggressively enforced by the State of South Carolina, which has authority over Savannah River's NPDES Permit. This permit has had a Notice of Violation in effect since July 1977 that has never been rescinded. The State has shown by past experience that it will not hesitate to penalize Federal facilities for being recalcitrant.

10. Details of Cost Estimate a/

	Item Cost	Total Cost
A. Engineering Design & inspection at 21% of construction costs, Item B.....		\$1,375 ^{b/}
B. Construction Costs.....		6,665
(1) Improvements to Land.....	\$ 10	
(2) Buildings at approximately \$167 per sq. ft.....	45	
(3) Special facilities.....	6,610	
(a) Equipment.....	\$1,320	
(b) Piping.....	3,422	
(c) Instrumentation.....	680	
(d) Electrical.....	1,188	

a/ Based on complete conceptual design.

b/ Includes \$350,000 PE&D.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Pollution discharge elimination,
Savannah River, South Carolina

2. Project No. 83-D-147

C. Removal costs.....	0
Subtotal.....	\$ 8,040
D. Contingency at approximately 24% of above costs.....	1,960
Total Estimated Cost.....	\$10,000

11. Method of Performance

Design will be performed by the operating contractor. Construction and procurement will be accomplished by fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

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

	Prior Years	FY 1983	FY 1984	Proposed FY 1984 Supplement	FY 1985	FY 1986	TOTAL
a. Total Project Funding							
1) Total Facility Costs							
a) Construction Line Item.....	\$ 0	\$ 0	\$ 1,400	\$ 1,500	\$ 2,500	\$ 4,250	\$ 9,650
b) PE&D.....	0	23	327	0	0	0	350
c) Expense Funded Equipment.....	0	0	0	0	0	0	0
d) Inventories.....	0	0	0	0	0	0	0
Total Facility Costs.....	\$ 0	\$ 23	\$ 1,727	\$ 1,500	\$ 2,500	\$ 4,250	\$10,000
2) Other Project Funding							
a) R&D necessary to complete construction	\$ 200	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	200
b) Other Project Related Cost....	0	0	0	0	0	0	0
Total Other Project Funding...	\$ 200	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	200
Total Project Funding.....	\$ 200	\$ 23	\$ 1,727	\$ 1,500	\$ 2,500	\$ 4,250	\$10,200

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Pollution discharge elimination,
Savannah River, South Carolina

2. Project No. 83-D-147

b. Total Related Funding Requirements (Estimated Life of Project: 20 years)

1) Facility Operating Costs	\$ 0
2) Programmatic Operating Expense Directly Related to the Facility.....	0
3) Capital Equipment Not Related to Construction but Related to the Effort in the Facility.....	0
4) GPP or Other Construction Related to Programmatic Effort in the Facility.....	0
5) Other Costs.....	0
Total Other Related Annual Funding Requirements.....	\$ 0

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

a. Total Project Funding

1) Total Facility Costs

- a) Construction Line item - No narrative required.
- b) PE&D - FY1982.
- c) Expense Funded Equipment - None.
- d) Inventories - None.

2) Other Project Funding

- a) R&D Necessary to Complete Construction - Conceptual design and engineering studies.
- b) Other Project Related Costs - None.

b. Total Related Funding Requirements

- 1) Facility Operating Costs - None.
- 2) Programmatic Operating Expenses Directly Related to the Facility - None.
- 3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility - None
- 4) GPP or Other Construction Related to Programmatic Effort - None.
- 5) Other Costs - None.

Department Of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Non-radioactive hazardous waste management
Savannah River, South Carolina

2. Project No. 83-D-148

3. Date A-E Work Initiated: 3rd Qtr. FY 1983^{a/}

5. Previous Cost Estimate: \$22,600
Date: 12/82

3a. Date Physical Construction Starts: 3rd Qtr. FY 1984

6. Current Cost Estimate: \$22,600
Less amount for PE&D 500
Net Cost Estimate: \$22,100
Date: 8/83

4. Date Construction Ends: 2nd Qtr. FY 1987

7. Financial Schedule:

	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Cost</u>
	1983	\$ 1,000	\$ 1,000	\$ 1,000	\$ 0
	1984	3,000	3,000	3,000	1,890
	Proposed 1984 Supplement	3,500	3,500	3,500	1,700
	1985	11,500	11,500	11,500	5,000
	1986	3,100	3,100	3,100	7,475
	1987	0	0	0	6,035

8. Brief Physical Description of Project:^{b/}

This project will provide facilities to dispose of hazardous waste generated at the Savannah River Plant. The items to be provided include:

- o Facilities in A, P, K, C, F, H, and D Areas to contain, recover, or neutralize accidental chemical spills.
- o Facilities at the SRL-TNX to adjust the pH of aqueous effluents destined for disposal.

^{a/} PE&D funded design.

^{b/} Facilities in 300-M metallurgical manufacturing area to adjust pH of aqueous effluents have been deleted from project.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Non-radioactive hazardous waste management Savannah River, South Carolina

2. Project No. 83-D-148

8. Brief Physical Description of Project (cont'd)

- o A hazardous waste landfill having a capacity to accept accumulated inventory, projected waste quantities for the next five years, plus contaminated soil from the existing chemical, metal, pesticide pits.
- o An effluent neutralization facility for the SRL-TNX to control biological oxygen demand, suspended solids, and nitrogen to within the limits required for aqueous releases.
- o An incinerator in G Area to detoxify and reduce solid hazardous waste prior to burial in a landfill.
- o A facility in the G Area to allow the redrumming of leaking containers, absorption of hazardous liquids, and special detoxification treatments.
- o Fences, utilities, and buildings as needed for the operation, safety, and security of these facilities.

FY 1985 funding will be used to continue design and construction.

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

The facilities to be provided under this project are required to treat and dispose of hazardous wastes generated at the Savannah River Plant in a manner that will meet regulations promulgated by the Federal Environmental Protection Agency (EPA) and the State of South Carolina under the Resource Conservation and Recovery Act of 1976. Recent measurements have indicated that organic waste from Savannah River's existing seepage basins have begun to enter the groundwater. This presents a potential hazard since certain of these wastes - mercury, trichloroethylene, and perchlorethylene - are toxic or suspected carcinogens. As an initial step towards rectifying such problems, current waste streams will be brought into compliance with regulations. Failure to take corrective action is likely to result in legal action by the state of South Carolina and the loss of public trust.

10. Details of Cost Estimate^{b/}

	Item Cost	Total Cost
A. Engineering, design, and inspection at approximately 20% of construction cost, Item B.....		\$ 2,945 ^{c/}
B. Construction Costs.....		14,810
(1) Improvements to Land.....	\$ 40	
(2) Buildings.....	430	
Four at approximately \$75 per sq. ft.		

^{b/}Based on completed conceptual design.

^{c/}Includes PE&D.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Non-radioactive hazardous waste management Savannah River, South Carolina

2. Project No. 83-D-148

(3) Special Facilities.....	14,340	
(a) Equipment.....	\$9,600	
(b) Piping.....	2,805	
(c) Instrumentation.....	735	
(d) Electrical.....	1,200	
C. Removal costs.....		0
Subtotal.....		\$17,755
D. Contingency at approximately 27% of above costs		4,845
Total Estimated Cost.....		\$22,600

11. Method of Performance

Design will be performed by the operating contractor. Construction and procurement will be accomplished by the operating contractor, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

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

	Prior Years	FY 1983	FY 1984	Proposed FY 1984 Supplement	FY 1985	FY 1986	FY 1987	Total
A. Total Project Funding								
1) Total Facility Costs								
a) Construction Line Item.....	\$ 0	\$ 0	\$1,890	\$ 1,700	\$ 5,000	\$ 7,475	\$ 6,035	\$22,100
b) PE&D.....	0	130	370	0	0	0	0	500
c) Expense Funded Equipment....	0	0	0	0	0	0	0	0
d) Inventories.....	0	0	0	0	0	0	0	0
Total Facility Costs.....	\$ 0	\$ 130	\$2,260	\$ 1,700	\$ 5,000	\$ 7,475	\$ 6,035	\$22,600
2) Other Project Funding								
a) R&D Necessary To Complete Construction	\$ 325	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 325
b) Other Project Related Cost.	0	0	0	0	0	0	0	0
Total Other Project Funding	\$ 325	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 325
Total Project Funding.....	\$ 325	\$ 130	\$2,260	\$ 1,700	\$ 5,000	\$ 7,475	\$ 6,035	\$22,925

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Non-radioactive hazardous waste management
Savannah River, South Carolina

2. Project No. 83-D-148

B. Total Related Funding Requirements (Estimated Life of Project is 20 years)

1) Facility Operating Costs.....	\$	0
2) Programmatic Operating Expense Directly Related to the Facility.....		0
3) Capital Equipment Not Related to Construction but Related to the Effort in the Facility.....		0
4) GPP or Other Construction Related to Programmatic Effort in the Facility.....		0
5) Other Costs.....		0
Total Other Related Annual Funding Requirements.....	\$	0

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

A. Total Project Funding

1) Total Facility Costs

- a) Construction Line Item - No narrative required.
- b) PE&D - \$500 provided in FY 1981.
- c) Expense Funded Equipment - None.
- d) Inventories - None required.

2) Other Project Funding

- a) R&D Necessary to Complete Construction - Conceptual design and engineering studies.
- b) Other Project Related Costs - None.

B. Total Related Funding Requirements

- 1) Facility Operating Costs - None.
- 2) Programmatic Operating Expenses Directly Related to the Facility - None.
- 3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility - None.
- 4) GPP or Other Construction Related to Programmatic Effort - None.
- 5) Other Costs - None.

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Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and Location of Project: Facility Storage Modifications,
Various Locations	2. Project No. 83-D-180
3. Date A-E Initiated: 1st Qtr. FY983	5. Previous Cost Estimate: \$15,800
Date: 12/82
3a. Date Physical Construction Starts: 2nd Qtr. FY1983	6. Current Cost Estimate: \$15,800
Date: 12/83
4. Date Construction Ends: 3rd Qtr. FY1986	

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1983	9,300	9,300	9,300	271
1984	0	0	0	5,200
1985	6,500	6,500	6,500	6,450
1986	0	0	0	3,879

8. Brief Physical Description of Project:

This project provides for expanded facilities and associated equipment at Savannah River and at the Oak Ridge Feed Materials Production Center (FMPC).

At Oak Ridge this project provides for a 12,000 square foot warehouse for storage of uranium compounds, and a 4,400 square foot in-process space modification both at FMPC (TEC \$800,000). The 19,000 square foot receiving storage and shipping warehouse at the RMI Ashtabula Plant (TEC \$500,000) is under construction utilizing GPP funds and was removed from the scope of this project.

At Savannah River this project provides new facilities necessary to support three reactor operations with MK15 fuel and 3 percent PU-240 product specification (one reactor assumed to be on MK22). The project requires: expansion of core storage, slug storage, new tooling, uranium recovery facilities, autoclave cycle automation, and two raw chemical storage tanks.

The storage expansion for bare MK15 cores requires a new, one-story building of approximately 8000 sq. ft. (100' x 80') on a concrete pad. This building will be prefabricated construction with exhaust fan ventilation and no heat or air conditioning. Fire protection will be provided by a wet pipe sprinkler system.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Facility Storage Modifications,
Various Locations

2. Project No. 83-D-180

8. Brief Physical Description of Project:(Cont'd)

The storage expansion for canned MK15 slugs requires a new one-story building of about 8000 square feet (100' x 80'). It will also be prefabricated construction with internal features similar to the bare core storage building.

The new tooling to be provided on this project is required to convert existing process equipment for operation with the MK15 product, which has different dimensions from the current MK31 product.

The uranium recovery facilities will improve the existing ability to recover uranium from the effluent streams in the building prior to discharge to the process sewer. This will be accomplished on the autoclave effluent collection system, as well as process fluid neutralization systems. A small extension on the existing recovery room will house the new tanks and filter.

This project will also provide for automation of autoclave operation. All process and service piping around the autoclaves will be replaced to accommodate automatic valves and instruments and a new control room adjacent to the autoclaves to operate the system.

The two new chemical storage tanks consist of one 10,000 gallon sodium hydroxide tank and one 12,000 gallon nitric acid tank. Associated with these are a truck unloading station, associated piping and pumps, and a header supply system to Building 313-M.

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

The MK 15 is a slightly enriched fuel that can provide increased plutonium production in a Savannah River reactor. New fabrication facilities and equipment are required for three reasons: 1) higher enrichments, 2) changed fuel size, and 3) larger number of fuel pieces.

Expansion of storage space is necessary to accommodate the 80 percent increase in the rates for Mark 15 fuel relative to current production. The existing fuel fabrication building does not have the required space. The size of the new storage buildings is based on batch process requirements at postulated process interruptions or delays in shipping bare cores to SRP. With these storage buildings, an interruption or delay of up to 2 months will not impact delivery of fuel to SRP reactors.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Facility Storage Modifications,
Various Locations

2. Project No. 83-D-180

9. Purpose Justification of Need for, and Scope of Project:(Cont'd)

New tooling is required due to the size of the MK 15 product. Due to the 1.1 percent enrichment of MK 15 slugs, a change in uranium recovery operations is necessary to reduce discharge to the environment. In addition, the higher throughputs demand greater efficiency in the operation of the autoclaves. This requires automation of the autoclave cycle, a first step toward total automation of the autoclaves.

The existing storage tanks at Savannah River consist of two 750 gallon portable tanks. The sodium hydroxide tank is picked up by truck and transported to the 200 Area for refilling. The nitric acid tank is transported to the bulk tank behind Building 321-M for refilling. At the forecast production rates, these operations would be performed daily.

The increase in billet deliveries to RL in support of the conversion of N-Reactor to 6 percent plutonium-240 production, and the change of the SR production reactors to the slightly enriched uranium MK-15 fuel, result in a need for additional storage space at the Feed Materials Production Center. The impact of the change to the MK-15 fuel is much more significant. The current fuel, MK-31, is composed of depleted uranium and in-process storage can be at a much higher uranium density than is the case with enriched uranium metal. Also, the change to a total enriched uranium load puts the FMPC into a total recycle (chemical recycle) mode. This greatly increases the space required for in-process storage of the various enriched uranium compounds (salvage awaiting recycle, UO_2 , UO_3 , UF_4 , etc.).

FY 1985 funds will be used to complete project construction.

10. Details of Cost Estimate:a/

Item	Item Cost	Total Cost
A. Engineering Design & Inspection at approximately 26 percent of Construction Costs Item B.....		\$2,779
B. Construction Costs.....		10,866
a) Buildings.....	\$3,263	
b) Special Facilities.....	7,048	
c) Utilities.....	555	
C. Removal Costs.....		525
Subtotal		\$14,170
D. Contingencies at approximately 12 percent of above Costs.....		1,630
E. Total Project Cost.....		\$15,800

a/Based on completed conceptual design.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of project: Facility Storage Modifications,
Various Locations

2. Project No. 83-D-180

11. Method of Performance:

Design will be performed by the operating contractor. Construction and procurement will be accomplished by the operating contractor utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

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

A. Total Project Funding	Prior Years	FY 1983	FY 1984	FY 1985	FY 1986	Total
1. Total Facility Costs						
a) Construction Line Item.....	0	271	5,200	6,450	3,879	15,800
b) PE&D.....	0	0	0	0	0	0
c) Expense Funded Equipment....	0	0	0	0	0	0
d) Inventories.....	0	0	0	0	0	0
Total Facility Costs.....	0	271	\$5,200	\$6,450	\$3,879	15,800
2. Other Project Funding						
a) R&D(Conceptual Design).....	160	0	0	0	0	160
(Engineering Studies)....	0	450	200	25	0	675
b) Other Project-Related Costs.	75	100	100	925	0	1,200
Total Other Project Funding.	235	550	300	950	0	2,035
Total Project Funding.....	\$235	\$821	\$5,500	\$7,400	\$3,879	\$17,835

B. Total Related Funding Requirements (Estimated Life of Project: 20 Years)

	Annual Cost
1) Facility Operating Costs.....	\$ 0
2) Programmatic Operating Expense Directly Related to the Facility.....	0
3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility.....	0
4) GPP or Other Construction Related to the Programmatic Effort in the Facility.....	0
5) Other Costs.....	0
Total Related Annual Funding Requirements.....	\$ 0

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CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Facility Storage Modifications,
Various Locations

2. Project No. 83-D-180

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

A. Total Project Funding

1. Total Facility Costs

- a) Construction Line Item - No narrative required.
- b) PE&D - None
- c) Expense Funded Equipment - None
- d) Inventories - None

2. Other Project Funding

- a) R&D - A total of \$835,000 is expected to be spent for conceptual design and engineering studies associated with this project. No other R&D funds should be required.
- b) Other Project Related Costs-Approximately \$275,000 is expected to be spent for preparation of procedures and for training of personnel. Approximately \$500,000 is expected to be spent for plant liaison during the life of this project. An additional \$425,000 will be spent for vendor startup assistance, process materials and utilities during the startup time period.

B. Total Related Funding Requirements

- 1. Facility Operating Costs - No incremental operating cost will be required.
- 2. Programmatic Operating Expenses Directly Related to the Facility - None
- 3. Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility - None
- 4. GPP or Other Construction Related to Programmatic Effort - None
- 5. Other Costs - None

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations	2. Project No. 82-D-124
3. Date A-E Work Initiated: 1st Qtr. FY 1982	5. Previous Cost Estimate: \$315,750 Less Amount for PE&D: 750 Net Cost Estimate: \$315,000 Date: 8/82
3a. Date Physical Construction Starts: 2nd Qtr. FY 1982	
4. Date Construction Ends: 4th Qtr. FY 1988	6. Current Cost Estimate: \$369,000 ^{a/} Less Amount for PE&D: 750 Net Cost Estimate: \$367,250 Date: 5/83

7. Financial Schedule

Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1982	\$126,000	\$ 45,000 ^{b/}	\$ 45,000 ^{b/}	\$ 7,254
1983	8,700	89,700 ^{b/}	82,232 ^{b/}	30,838
1984	104,600	97,134 ^{c/}	104,602	67,942
1985	72,800	72,800	72,800	80,520
1986	62,616	62,616	62,616	121,371
1987	0	0	0	51,340
1988	0	0	0	7,985

a/ Increase results from the addition of Phase V.

b/ \$2,000,000 of FY 1982 Appropriation temporarily reprogrammed to Project 81-D-143 then returned in FY 1983.

c/ \$7,466,000 of FY 1984 Appropriation reprogrammed to Project 82-D-126.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities,
Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

8. Brief Physical Description of Project

This project provides for upgrading facilities for the production of nuclear materials in support of the national defense programs. Physical deterioration that has accumulated as a result of the aging of DOE's production plants at Savannah River, South Carolina; Richland, Washington; Oak Ridge, Tennessee; and Fernald, Ohio will be corrected. Due to the size and diverse nature of this undertaking, work has been subdivided into five separate phases. Phase I (Project 81-D-128) was authorized in FY 1981. The following briefly describes the new subprojects planned to be initiated in Phase V and those currently contained in Phases II, III, and IV; all of which are combined in this line item. The actual scope of work to be performed will be updated prior to the initiation of design to encompass any changes in equipment conditions or priorities.

- a. Replace Obsolete Plutonium-238 Facilities, HB-Line, Savannah River, South Carolina
(TEC \$23,500,000; no FY 1985 BA)

This Phase II subproject, the third in a series to replace obsolete HB Line facilities, provides a new building addition for processing plutonium-238. The addition will be located on the top of canyon building 221-H and will be two stories in height and approximately 70 feet by 40 feet in size. Approximately 2300 cubic feet of new glove box cabinets will be provided to permit the radioactive materials to be worked under safe conditions. The ventilation system will be designed to maintain confinement of the materials with air flow directed from clean to progressively more contaminated compartments. Automatic fire suppression will be provided for all process room cabinets.

- b. Steam and Power Production Facilities, Savannah River, South Carolina (TEC \$3,800,000; no FY 1985 BA)

This Phase II subproject provides for renovation of wornout and obsolete coal handling components at Savannah River's 484-D Powerhouse. Structural, electrical, and mechanical equipment will be renovated or replaced to improve safety, reliability, and operating efficiency.

- c. Reactor Fuel Handling Improvements (Part B), Savannah River, South Carolina (TEC \$9,600,000; no FY 1985 BA)

This Phase II subproject completes a series of safety improvements to the handling equipment used to charge and discharge fuel and target assemblies in Savannah River's P, K, and C reactors. Modifications include: multiplexing all control functions; providing alternate power for moving the discharge machine under emergency conditions; separation of normal and emergency power cables; replacement of motor drives; and upgrading of critical components such as the emergency brake, emergency disengaging clutch and release.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities,
Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

8. Brief Physical Description of Project (cont'd)

- d. N Reactor Control Systems, Richland, Washington (TEC \$5,000,000; FY 1985 BA \$1,530,000)

This Phase II subproject includes upgrading of the ball safety systems and horizontal control rod system for shutting down N Reactor under normal and abnormal conditions. The ball system upgrade work will include replacement of the ball drain valve operators, and replacement of the upper ball distribution system. The horizontal control rod inserts, which have become pitted from corrosion, will be replaced to forestall rod failure. In addition, the horizontal rod hydraulic power units will be replaced to improve system reliability. FY 1985 BA will be used to continue construction.

- e. N Reactor Coolant System Equipment and Instrumentation, Richland, Washington (TEC \$12,000,000; FY 1985 BA \$4,694,000)

This Phase II subproject is intended to forestall the failure or malfunction of major items of equipment and instrumentation in the reactor cooling system that could force reactor shutdown. Worn or obsolete components will be replaced for increased reliability. The work will include items such as: replacement of the secondary cooling system hydraulic valve operators; replacement of a graphite cooling system heat exchanger; replacement of flow rate instrumentation, coolant monitoring instrumentation, and control valves; and upgrading of the coolant water sampling system. FY 1985 BA will be used to continue construction.

- f. Enriched Uranium Processing, Y-12 Plant, Oak Ridge, Tennessee (TEC \$9,300,000; FY 1985 BA \$5,700,000)

This Phase III subproject provides for the replacement of existing equipment and facilities in Building 9206 and 9212 at the Oak Ridge Y-12 Plant which are dedicated to the processing of enriched uranium in support of DOE production reactor operations. Obsolete or wornout items such as the evaporator system, uranium-aluminum alloy recovery system, evaporator controls, drying furnaces, filtering equipment, etc. will be replaced. Accomplishment of the project will be spread over a period of four years in order to minimize disruption of production operations. The FY 1985 BA will be used to complete construction.

- g. Production Components Replacement, Various Locations (TEC \$76,700,000; FY 1985 BA \$10,894,000)

This multi-phase subproject provides for replacement of individual reactor and separations process components that have deteriorated due to age, wear, or the corrosive nature of the materials used in the process operations. At Richland, Washington; N Reactor piping insulation which has been steadily degrading over the past years will

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities,
Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

8. Brief Physical Description of Project (cont'd)

be replaced; instrumentation and controls on the helium gas system, which provides an inert atmosphere to blanket the reactor, will be replaced with more precise units; and the reliability of the equipment annunciator system, which provides data for reactor control and operation, will be improved. At Savannah River, Separations Department components - agitators, vacuum transfer systems, acid recovery columns, dissolver tanks, and instrumentation - will be replaced together with equipment piping, valves, and electrical power distribution systems. Reactor piping and ventilation components that are nearing the end of their lifespan and are no longer repairable will also be renewed together with emergency alarm and communication equipment. Larger Phase V tasks include upgrading of reactor purification cell crane optical systems, replacement of the motor-generators that power the charge and discharge machines, and replacement of existing cation exchange columns.

h. Replace Production Support Equipment and Systems, Various Locations (TEC \$77,104,000; FY 1985 BA \$10,782,000)

This multi-phase subproject provides for the replacement of support equipment and systems that have become technologically inadequate or that can no longer reliably perform their assigned function. Most tasks will cost less than \$500,000. Work includes replacement of radiation monitoring and contamination control equipment at SR; restoration of Power Department mechanical components and instrumentation systems, SR; replacement of obsolete manipulators and laboratory equipment, SR; upgrading of the fuel fabrication facility, RL; restoration of the N Reactor backup steam supply, RL; replacement of heavy mobile equipment at SR; and other similar activities. Phase V will include new Savannah River tasks such as replacement of the critical alarm systems in the Building 773A high level caves, upgrading of facilities for coulometric determination of plutonium and uranium, and replacement of the 285 F&H process cooling water pump turbines.

i. Replacement Primary Heat Exchangers, Savannah River, South Carolina (TEC \$12,000,000; FY 1985 BA \$6,600,000)

This Phase V subproject provides for procurement of replacement production reactor primary heat exchangers. The 36 heat exchangers now in service have reached the end of their service life and are being replaced as failures occur. Two initial replacement units were provided under Phase I of the Restoration Project; \$12,000,000 is requested in Phase V to procure the next increment of replacements.

j. Restore Deteriorated Canyon Cells, Savannah River, South Carolina (TEC \$4,800,000; FY 1985 BA \$1,000,000)

This Phase III subproject replaces canyon cell covers, floor surfaces, and embedden piping that have been corroded by acid vapors to the point that continued deterioration may lead to a loss of production capability. FY 1985 BA will be used to complete construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities,
Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

8. Brief Physical Description of Project (cont'd)

- k. Renovation of High Voltage Transmission System Control and Monitoring, Savannah River, South Carolina
(TEC \$17,000,000; FY 1985 BA \$8,400,000)

This Phase III subproject replaces approximately 67 miles of supervisory control cables and the existing multi-station relay control systems for Savannah River Plant's 115 KV electrical distribution network. Insulation and shielding on the existing underground cables have only limited remaining life. FY 1985 BA will be used to complete construction.

- l. Replace Plutonium Precipitator Cabinets, Savannah River, South Carolina (TEC \$11,000,000; FY 1985 BA \$1,000,000)

This Phase II subproject provides replacement shielded cabinets and process equipment to precipitate and filter plutonium trifluoride from plutonium nitrate solutions. The existing cabinets and equipment are in poor condition and can no longer meet radiation protection or reliability requirements. New tanks, washing stations, and seal pots will be installed together with associated piping, instrumentation and other auxiliaries. FY 1985 BA will be used to complete construction.

- m. JB-Line Restoration, Part A, Savannah River, South Carolina (TEC \$8,500,000; FY 1985 BA \$1,500,000)

This Phase II subproject provides for the repair or replacement of JB-Line plutonium processing equipment and systems that have become worn and unreliable. Items to be restored include: the oxidation furnace, holdup and filtrate neutralization cabinets, the hydraulic lift system, breathing air compressors, process piping, and the heating and ventilating system. FY 1985 funding will be used to complete construction.

- n. Reactivation of UF_6 - UF_4 Reduction Facility, Feed Materials Production Center, Fernald, Ohio
(TEC \$10,300,000; No FY 1985 BA)

This Phase II subproject covers the reactivation and replacement of existing equipment at the Feed Materials Production Center which will be used to reduce uranium hexafluoride (UF_6) to uranium tetrafluoride (UF_4). The items proposed for reactivation or replacement include autoclave vaporizers, ammonia dissociators, and the refrigeration system for recovery of anhydrous hydrogen fluoride.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities,
Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

8. Brief Physical Description of Project (cont'd)

- o. Uranium Target Plating Line, Savannah River, South Carolina (TEC \$5,600,000; FY 1985 BA \$600,000)

This Phase III subproject will provide an automated plating line to nickel plate uranium slugs in the fuel processing area at the Savannah River Plant. The automated plating line will replace an existing line, which is no longer capable of maintaining required production levels and will be removed. The new plating line will consist of two sections, one for anodic etching and the other for nickel plating. It will be installed in space available in the existing uranium slug manufacturing building, adjacent to the present plating line. FY 1985 BA will be used to complete construction.

- p. Restoration of Special Materials Processing Facilities, Feed Materials Production Center, Fernald, Ohio
(TEC \$9,046,000; no FY 1985 BA)

This Phase III subproject provides for restoration of a furnace used to melt and cast uranium. New crucible loading and burnout stations will be installed for this furnace and the obsolete burnout stations in Plant 5 will be reconditioned. The existing vacuum pumps, controllers, voltage regulators, and mold tanks in Plant 5 will also be restored.

- q. Modifications to Radiological Support Facilities, Savannah River, South Carolina (TEC \$8,900,000; FY 1985 BA \$6,100,000)

This Phase IV subproject provides an approximately 25,000 square foot addition to the existing Radiological and Environmental Science Laboratory. About 60 percent of the building area will be devoted to laboratories and about 40% to offices and support facilities. This project is required to support the expanding programs of the Savannah River Laboratory Environmental Sciences Section (ESS) and the Savannah River Plant Health Protection Department. FY 1985 BA will be used to continue design, procurement, and construction.

- r. Powerhouse Coal Handling Facilities, Savannah River, South Carolina (TEC \$6,800,000; FY 1985 BA \$1,800,000)

This Phase IV subproject will restore the mechanical, structural, and electrical components of the P, K, H, and A Area powerhouse coal handling systems. These facilities have deteriorated from use and corrosion caused by water and coal leachate. Replacement of the moderate to severely damaged parts is required to maintain safety and reliability. Associated electrical systems must also be upgraded to comply with current dust-ignition-proof code requirements. FY 1985 BA will be used to continue procurement and construction.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities,
Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

8. Brief Physical Description of Project (cont'd)

s. Production Control Facility, Savannah River, South Carolina (TEC \$16,200,000; no FY 1985 BA)

This Phase III subproject provides a 34,000 square foot addition to the existing Production Control Facility, Building 772-F, to analyze highly radioactive process samples from dissolution of fuel tubes and target slugs. These analyses are used to determine the quantity of plutonium produced in the Savannah River reactors and to measure the results of succeeding chemical separations steps. Operating delays are already being experienced due to slow answers and inaccurate results. With the increased separations throughput that will occur when L Reactor is brought on-line problems will become more frequent. Further, the overall condition of the existing facility has deteriorated to a level where the risk of major long term outage due to accident or equipment failure is excessive. The addition will contain 17 laboratories, four shielded analytical cells, a control room, and necessary service facilities.

t. JB-Line Restoration, (Parts B & C), Savannah River, South Carolina (TEC \$20,500,000; FY 1985 BA \$6,000,000)

This Phase IV subproject upgrades and overhauls JB-Line facility equipment to restore equipment reliability to meet Pu-239 production commitments. Overhaul will consist of replacement of instrumentation and equipment with state-of-the-art design where practical, replacement of wornout equipment, regasketing of piping and upgrades of cabinet panel seal and H&V system. Overhauls on each glovebox will be performed in a manner to minimize downtime. The following are five areas of work for JB-Line restoration covered in Parts B and C:

- (1) Complete duct piping upgrades.
- (2) Overhaul Recovery Process Equipment.
- (3) Miscellaneous Mechanical Line Upgrades.
- (4) Replace Anion and Recovery Control Panels.
- (5) Install new solution transfer vacuum system.

FY 1985 BA will be used to continue design, procurement and construction.

u. Replace Emergency Cooling Water Drain Lines, Savannah River, South Carolina^{a/} (TEC \$4,800,000; no FY 1985 BA)

This Phase III subproject replaces sections of the underground vitrified clay drainlines that are used to convey contaminated water from the P, C, or K reactors in event of activation of the emergency cooling system or process room spray systems. Existing drainlines have cracked and should not be subjected to prolonged pressurized operation. The new replacement lines will be reinforced concrete for increased structural integrity and will be sized for 17,500 gallons per minute of flow.

^{a/} Previously listed as a "Production Components Replacement" task.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations	2. Project No. 82-D-124
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8. Brief Physical Description of Project (cont'd)

v. Warm Canyon Cranes, Savannah River, South Carolina (TEC \$10,300,000; FY 1985 BA \$4,200,000)

This Phase V subproject restores the cranes in the 200 F and H area warm canyons. Restoration will include upgrading of electrical and instrumentation, replacement or repair of mechanical components and replacement of the cab air supply systems. FY 1985 BA will be used for initial design and procurement.

w. Central Powerhouse Control, Savannah River, South Carolina (TEC \$4,500,000; FY 1985 BA \$1,200,000)

This Phase V subproject provides an energy optimization system in Building 484-D Powerhouse. This system will consist of a computer and the required sensing instrumentation to continuously monitor data from which efficiency versus load curves for major energy consuming equipment pieces can be determined. The information thus obtained will permit the operator to choose the most efficient equipment loading to meet current process steam and electrical demand. FY 1985 BA will be used to initiate design, procurement, and construction.

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

The Restoration Project directly supports the department's assigned mission of providing nuclear materials for national defense needs. The facilities and equipment involved are the prime source of weapon-grade materials within the United States. It is therefore necessary that excessive breakdowns be avoided and that production needs be met in a safe, effective, and efficient manner.

The majority of Nuclear Material Production's plants are now over twenty-five years old and have considerable age deterioration. Some of the equipment is obsolete and/or replacement parts are unavailable. In many cases vendors who furnished the equipment twenty-five years ago are no longer in business. Further, transitions in safety, process, and regulatory requirements over the years have caused some original facilities to become deficient with respect to the current state-of-the-art.

Due to funding restraints; line item construction, general plant projects and capital equipment appropriations have been insufficient to correct these deficiencies as they developed. Items previously considered deferable have gradually reached the point of urgency.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities,
Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

9. Purpose, Justification of Need For, and Scope of Project (cont'd)

The measures necessary to restore the production complex to a condition adequate to meet mission requirements was submitted to Congress in June 1979. Execution is being achieved through this five phase construction effort and associated operating funded activities. The final escalated cost of both activities will be approximately \$460 million.

10. Details of Cost Estimate^{a/}

	Item Cost	Total Cost
A. Engineering, Design and Inspection Costs at approximately 19% of construction costs, Item B ...		\$ 36,090 ^{b/}
B. Construction Cost		243,900
(1) Improvements to land	\$ 4,155	
(2) Buildings	35,947	
(3) Special Facilities	200,355	
(4) Utilities	3,443	
C. Removal Costs Less Salvage		3,850
D. Equipment		24,870
Subtotal		308,710
E. Contingency at approximately 19% of above cost		58,540
Total Project Cost		\$367,250

11. Method of Performance

Design will be performed by both the operating contractors and negotiated architect-engineer contracts. Construction and procurement will be accomplished by the operating contractors, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

^{a/} The above estimates are based on varying degrees of subproject completion, ranging from conceptual design to actual construction costs.

^{b/} Excludes \$750,000 PE&D.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities, Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

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

[illegible]

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Restoration of production capabilities,
Phases II, III, IV, and V, various locations

2. Project No. 82-D-124

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

A. Total Project Funding

(1) Total Facility Costs

- (a) Construction line item - No narrative required.
- (b) PE&D - \$750,000 in FY 1983.
- (c) Expense funded equipment - None.

(2) Other Project Funding

- (a) Conceptual design - No narrative required.
- (b) Other project related costs - This item includes:
 - o \$13,000,000 for decontamination and disposal of obsolete HB-Line facilities after completion of the new subprojects.
 - o \$9,380,000 for liaison and startup.
 - o \$5,965,000 for program management and administration.
 - o \$32,800,000 for operating funded repairs and renovation.

B. Total Related Funding Requirements

This project will provide replacement or modification of existing facilities. The modified facilities are intended to be used in lieu of the facilities they replace. Expenses to operate and maintain the modified facilities will be essentially the same or less than the existing facilities. The savings shown result from reduced operating cost.

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Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Assistant Secretary for Defense Programs
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Reactor safety and reliability, Various Locations	2. Project No. 82-D-126
3. Date A-E Work Initiated: 1st Qtr. FY 1982	5. Previous Cost Estimate: \$62,700
Date: 3/83
3a. Date Physical Construction Starts: 3rd Qtr. FY 1982	6. Current Cost Estimate: \$41,150
Less PE&D (FY 1983): 550
Net Cost Estimate: \$40,600 ^{a/}
Date: 12/83
4. Date Construction Ends: 2nd Qtr. FY 1987	

7. Financial Schedule

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Cost</u>
	1982	\$42,900	\$ 4,000 ^{b/}	\$ 4,000 ^{b/}	\$ 1,562
CA	1983	0	9,000 ^{b/}	9,000 ^{b/}	3,080
CS	1984	0	14,500 ^{c/}	14,500 ^{c/}	9,500
FA	1985	0	11,300	11,300	11,800
	1986	0	1,800	1,800	11,100
	1987	0	0	0	3,558

8. Brief Physical Description of Project

This project provides for additional improvements in the safety systems of the Savannah River plutonium production reactors and the N production reactor at Richland, Washington. Included are subprojects to improve the safety controls of four Savannah River production reactors (P, C, K, and L), a subproject to direct and contain Richland N-Reactor primary loop and fuel basin coolant water in a holdup facility for decay of short lived isotopes, and a subproject to mitigate the consequences of a potential nuclear accident by providing remote emergency shutdown capability.

a/ Savannah River Reactor Shutdown Circuitry subproject was deleted from this project.

b/ \$2,000,000 of FY 1982 Appropriation of \$6,000,000 temporarily reprogrammed to project 81-D-143, L Reactor Upgrade. Funds were returned in FY 1983.

c/ 1984 appropriation includes \$8,500,000 reprogrammed as follows: \$1,000,000 from project 80-AE-2, \$7,466,078 from project 82-D-124, and \$33,922 from project 77-13-b underrun.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Reactor Safety and Reliability, Various Locations	2. Project No. 82-D-126
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8. Brief Physical Description of Project (cont'd)

The following briefly describes each subproject:

a. Remote Detection and Controls, Reactor Areas, Savannah River, South Carolina (TEC \$12,300; FY 1985 BA \$5,200)

This project provides new equipment for remote detection and control of critical cooling and ventilating systems after reactor shutdown. The equipment will replace an existing relay logic system. It will include (1) small computers in P, K, L and C reactor buildings and in the 751-1A remote control center, and (2) interfaces with existing monitoring and control devices in the reactor scram circuitry. Data and control signal transmission will be by existing buried and overhead cable. Data will also be transmitted to a computer display terminal in the Building 703-A emergency operating center.

67
68
69 The equipment will monitor and control those functions required to establish safe shutdown conditions to remove decay heat from components in the reactor, and to minimize releases of radioactive materials to the environment. These functions include monitoring of water levels, temperatures, pressures, and activities; monitoring of air temperatures and activities; and control of pumps, valves, fans and dampers. Improved capability to test the monitoring and control devices during reactor operation or brief outages will be included.

The existing remote detection and control equipment is a relay logic system that requires excessive maintenance, has limited capability for testing during reactor operation, requires excessive time for data interpretation, and is not in a location where it can be staffed continuously by the reactor operating department.

The \$1,000,000 decrease in the TEC for this project since the FY 1984 congressional submission is due to advancement of the project schedule due to the reprogramming action in FY 1984.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Reactor Safety and Reliability, Various Locations 2. Project No. 82-D-126

8. Brief Physical Description of Project (cont'd)

b. Reactor Simulator and Expanded Training Facilities, Savannah River, South Carolina (TEC \$16,000); FY 1985 BA \$600)

This project provides a new training facility for the Savannah River production reactor operators. The new facility will replace the existing training facilities which are primarily mobile, modular offices converted to classrooms.

A new building, located in the Savannah River 100-C production reactor area, will provide space for classrooms, offices, and a production reactor control room simulator. The new building will be masonry construction with approximately 51,000 square feet of floor area. The simulator will be a computer-driven replica of the production reactor control room and will permit hands-on training of reactor operators for both normal operations and emergencies.

The \$1,100,000 decrease in TEC for the Reactor Simulator since the FY 1984 congressional submission is due to reduced cost associated with firm bids and due to the reprogramming in FY 1984.

c. Supplemental ECCS/FS Supply, Richland, Washington (Project completed in FY 1983)

This project provides improved reliability and additional raw water pumping capacity for the N-Reactor emergency cooling water system so that the total demands of the Emergency Core Cooling System (ECCS) and the fog spray system (FS) can be supplied concurrently assuming a single active component failure. This will be accomplished by installing a third low-lift pump at the river pump house (Building 181-N) and connecting its discharge pipe to the two existing raw water system pipes, just downstream from Building 181-H. Project cost \$1,502,000.

d. Control Room Habitability, Richland, Washington (TEC: \$6,200; FY 1985 BA \$4,700)

This project provides for the design and construction of modifications to the N Reactor control room that would allow a minimum five-day insolation period following a loss of coolant accident without limiting personnel to the use of fresh air breathing apparatus. The project will upgrade the leak resistance to toxic or radioactive gases, modify the ventilation system, and provide adequate emergency kitchen and sanitary facilities.

Reduction of \$100,000 in TEC (since FY 1984 congressional submission) is due to the availability of FY 1983 Plant Engineering and Design funds.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Reactor Safety and Reliability, Various Locations 2. Project No. 82-D-126

8. Brief Physical Description of Project (cont'd)

e. N Reactor Liquid Effluent Disposal Crib, Richland, Washington (TEC: \$2,000; no FY 1985 BA)

This project provides for the design and construction of a new liquid effluent disposal crib for N-Reactor to replace the existing 1301-N crib and outfall trench. The new facility will be sited inland of the existing 1301-N crib and will be designed to handle normal N-Reactor area liquid effluent disposal flow streams. A diversion to the N-Reactor emergency disposal basin (1312-N) will be provided to handle overflows which could occur under emergency conditions. Water flow to the new crib facility will be by gravity.

Reduction of \$700,000 in TEC since the FY 1984 congressional submission is due to additional design and better definition of construction requirements.

f. Emergency Shutdown Panel, Richland, Washington (TEC: \$2,160; FY 1985 BA \$800)

As presently defined, this subproject will provide for design and installation of a reactor shutdown facility that will provide for remote safe shut down of the reactor and display of vital reactor plant information. The vital information displayed will permit the emergency support team to verify that safe shutdown conditions are achieved and maintained. The control and display equipment will be installed remotely from the reactor control room to eliminate possible interference with necessary emergency response actions. Communications will be provided between the new facility and other emergency response centers.

Reduced TEC's for subproject items 8.c., d, and e, reflect changes from the FY 1984 congressional submission due to completion of subproject 8.c., and better design and construction definition for subprojects 8.d. and 8.e. Item 8.g. Reactor Emergency Support Center, Richland, Washington (TEC \$1,700,000) in the FY 1984 submission has been retitled and rescoped to the subproject item f. above. The title change and description more accurately reflect the construction efforts planned. The revised subproject function remains similar to that outlined in the FY 1984 submission, and is necessary to meet the basic purpose originally identified for reactor emergency support.

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

The many governmental (Kemeny Commission, Rogovin Report, Nuclear Regulatory Commission Lessons Learned Studies) and industry (National Society of Professional Engineers, Institute of Nuclear Power Operations, etc.) studies conducted to ascertain the lessons to be learned from the Three Mile Island nuclear reactor accident have resulted in improved standards for reactor operations. The independent assessments conducted by the department and the operating contractors for production reactors have established facility modifications required to be consistent with new industry standards. These modifications will reduce the probability of accidents in the nuclear production

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Reactor Safety and Reliability, Various Locations

2. Project No. 82-D-126

9. Purpose, Justification of Need for, and Scope of Project (cont'd)

reactors and enhance the safety of operations. In addition, improvements in the ability of reactor operators to manage emergency conditions have also been mandated. These improvements are of special applicability for production reactors due to the importance of their mission in establishing the national defense posture. The fact that Savannah River's P, K, C, and L reactors are nearly 29 years old and the Richland N-Reactor is a 1960 vintage design places added emphasis on the need to incorporate equipment, instrumentation and monitoring devices consistent with post-TMI practices.

10. Details of Cost Estimate^{a/}

	Item Cost	Total Cost
a. Engineering, Design and Inspection Costs at 13% of construction costs , Item b		\$ 3,815 ^{b/}
b. Construction Costs		28,886
(1) Buildings	\$ 2,661	
(2) Special Facilities	24,977	
(3) Utilities	972	
(4) Improvements to Land	276	
c. Removal Cost Less Salvage		310
	Subtotal	33,011
d. Contingency at approximately 16% of above costs		5,289
e. Design and Construction Liaison, Testing, Checkout and Acceptance		2,300
	Total Project Cost	\$40,600

11. Method of Performance

Design will be performed by the operating contractor or onsite cost plus award fee (CPAF) firm. Construction and procurement will be accomplished by the operating contractor or CPAF construction contractor, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

^{a/}Based on completed conceptual design.

^{b/}Excludes \$550,000 in PE&D funds.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Reactor Safety and Reliability, Various Locations

2. Project No. 82-D-126

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

[illegible]

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Reactor Safety and Reliability, Various Locations 2. Project No. 82-D-126

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

A. Total Project Funding

(1) Total Facility Costs

- (a) Construction Line Item - no narrative required.
- (b) PE&D - FY 1983 PE&D will provide for A-E services for subprojects 8.e. Control Room Habitability and 8.f. N Reactor Liquid Effluent Disposal Crib, both at Richland, Washington.
- (c) Expense funded equipment - none.
- (d) Inventories - none.

(2) Other Project Funding

- (a) Conceptual design includes preparation of a cost estimate for project authorization and improving equipment design.
- (b) Other project related funding - funding in section 12-a-(2)(b) is for Plant liaison, computer software and programming, and startup costs.

B. Total Related Funding Requirements

(1) Facility Operating Costs.

The annual cost for each Savannah River subproject:

- (a) Remote Detection and Controls - \$240,000 labor, materials for periodic testing, software and hardware maintenance.
- (b) Reactor Simulator - \$2,200,000 for utilities, operating staff (15), supplies, spare parts and general maintenance.

The annual cost for all Richland subprojects is estimated at \$40,000.

- (2) Programmatic Operating Expenses Directly Related to the Facility - None.
- (3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility - None.
- (4) GPP or Other Construction Related to Programmatic Effort - None.
- (5) Other Costs - None.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and Location of Project: Safeguards improvements,
Savannah River, South Carolina

2. Project No. 82-D-127

3. Date A-E Work Initiated: 1st Qtr. FY 1981 ^{a/}

5. Previous Cost Estimate: \$36,000
Date: 12/82

3a. Date Physical Construction Starts: 3rd Qtr. FY 1983

6. Current Cost Estimate: \$36,000

4. Date Construction Ends: 2nd Qtr. FY 1986

Less PE&D 1,400
Net Cost Estimate: \$34,600
Date: 4/83

7. Financial Schedule of Construction Project Funding

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Fiscal Year	Authorizations	Appropriations	Obligations	Costs
1982	\$34,600	\$ 1,000 ^{b/}	\$ 1,000 ^{b/}	\$ 0
1983	0	10,000 ^{c/}	10,000 ^{c/}	2,664
1984	0	7,000	7,000	4,800
Proposed 1984 Supplement	0	9,900	9,900	3,300
1985	0	6,700	6,700	14,500
1986	0	0	0	9,336

^{a/} PE&D funded.

^{b/} \$1,000,000 of FY 1982 Appropriation of \$2,000,000 temporarily reprogrammed to Project 81-D-143, L Reactor Upgrade. Funds were returned in FY 1983.

^{c/} Includes \$4,500,000 reprogrammed from FY 1983 Capital Equipment funds and \$4,500,000 transferred from operating expenses.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Safeguards improvements,
Savannah River, South Carolina

2. Project No. 82-D-127

8. Brief Physical Description of Project

The project provides new facilities to control access to the P, K, L, and C reactor areas and new systems to detect unauthorized entry.

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

Requested FY 1985 appropriations will be used to complete construction.

10. Details of Cost Estimate^{a/}

	Item Cost	Total Cost
a. Engineering, Design and Inspection at approximately 15% of construction costs, Item B	\$	\$ 4,150 ^{b/}
b. Construction costs		27,867
1) Improvements to Land	1,706	
2) Buildings	2,582	
3) Special Facilities	22,668	
- Elect. Detection Equipment	\$21,175	
- Piping	1,493	
4) Utilities	911	
c. Removal Costs		250
Subtotal (Items a, b, and c)		\$32,267
d. Contingencies at approximately 12% of above costs		3,733
Total estimated cost		\$36,000

11. Method of Performance

Design will be by the operating contractor in conjunction with Sandia Laboratory. Construction will be by the operating contractor utilizing, to the extent feasible, fixed-price subcontracts awarded on the basis of competitive bidding.

a/ Based on completed conceptual design.

b/ Includes \$1,400,000 in PE&D funds.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Safeguards improvements,
Savannah River, South Carolina

2. Project No. 82-D-127

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

	Prior Years	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986	Total
A. Total Project Funding							
1) Total Facility Costs							
a. Construction Line Item	\$ 0	\$ 0	\$ 2,664	\$ 8,100	\$14,500	\$ 9,336	\$34,600
b. PE&D	467	559	374	0	0	0	1,400
c. Expense Funded Equipment	0	0	0	0	0	0	0
d. Inventories	0	0	0	0	0	0	0
Total Facility Costs	\$ 467	\$ 559	\$ 3,038	\$ 8,100	\$14,500	\$ 9,336	\$36,000
2) Other Project Funding							
a. R&D (Conceptual Design)	\$ 125	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 125
(Engineering Studies) ...	85	65	50	0	0	0	200
b. Other Project Related Costs .	150	450	450	425	150	125	1,750
Total Other Project Funding .	\$ 360	\$ 515	\$ 500	\$ 425	\$ 150	\$ 125	\$ 2,075
Total Project Funding	\$ 827	\$ 1,074	\$ 3,538	\$ 8,525	\$14,650	\$ 9,461	\$38,075

B. Total Related Funding Requirement

	Annual Cost
1) Facility Operating Cost	\$ 1,770
2) Programmatic Operating Expense Directly Related to the Facility	0
3) Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility	0
4) GPP or Other Construction Related to the Programmatic Effort in the Facility	0
5) Other Costs	0
Total Other Related Annual Funding Requirements	\$ 1,770

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CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Safeguards improvements,
Savannah River, South Carolina

2. Project No. 82-D-127

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

A. Total Project Funding

(1) Total Facility

- a. Construction Line Item - No narrative required.
- b. PE&D - FY 1981 for advanced design of the safeguards facilities.
- c. Expense Funded Equipment - None.
- d. Inventories - None.

(2) Other Project Funding

- a. R&D - A total of \$325,000 is expected to be spent for conceptual design and engineering studies cost associated with this project. No other R&D funds will be required.
- b. Other project related costs - Approximately \$400,000 is expected to be spent for preparation of procedures and for training of operating and maintenance personnel for the safeguards facilities provided by this project. An additional \$650,000 is expected to be spent for plant liaison during the life of this project, beginning during conceptual design. Approximately \$700,000 is expected to be spent for computer software and programming.

B. Total Related Funding Requirements

(1) Facility Operating Costs

Approximately \$1,600,000 is expected to be spent for additional guards to man the facilities; \$170,000 is expected for additional energy and maintenance.

Department of Energy
FY 1985 CONGRESSIONAL REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Plant perimeter security systems upgrade, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho	2. Project No. 82-D-128
3. Date A-E work initiated: 2nd Qtr. FY 1982	5. Previous Cost Estimate: \$5,400
Date: 12/82
3a. Date Physical Construction Starts: 4th Qtr. FY 1982	6. Current Cost Estimate: \$5,400
Date: 12/83
4. Date Construction Ends: 4th Qtr. FY 1985	

7. Financial Schedule

	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
513	1982	\$4,400	\$1,000	\$1,000	\$ 247
	1983	0	1,000 ^{a/}	1,000 ^{a/}	739
	1984	0	3,000	3,000	2,000
	1985	1,000	400	400	2,414

^{a/} \$1,000,000 of FY 1983 appropriation reprogrammed to this project from project 82-D-136, Fuel Processing Facilities Upgrade.

CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Plant perimeter security systems upgrade, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho
2. Project No. 82-D-128
-

8. Brief Physical Description of Project

This project provides for the design and construction of security protective measures at the Idaho Fuels Processing Facility (IFPF). The budget authority level requested in FY 1985 is for continuation of procurement and construction activities.

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

Some of the specific requirements for protected areas as stated in the DOE Orders are as follows: (1) protected areas shall be subject to a system of access controls, (2) a sufficient level of illumination shall be provided at all points on the perimeter to permit assessment in the event of unauthorized attempts to penetrate the protected area, (3) a hardened security force communications center shall be established and shall have periodically tested radio and telephone channels of communication with local law enforcement agencies. There also shall be an emergency alternate communications capability from a secondary station for use in event the primary station is compromised, (4) perimeter intrusion alarm systems or equivalent means of providing early detection shall be used at the perimeter of protected areas of material access areas, (5) all detection/alarm devices, including transmission lines to annunciators, shall be failure and tamper indicating. Such devices shall be connected to monitor/display panels in the hardened security force communications center. An alternate alarm annunciation point (or a comparable alternate capability) shall be provided in a location which is continuously manned by cleared personnel and which provides a second indication of an alarm such that a response can be initiated in the event the primary station is compromised and (6) personnel, packages, briefcases, and similar containers, and all vehicles shall be subject to search at the entrance to a protected area. The search on entering, when performed, may be made with DOE-approved detection equipment designed to assure that explosives, weapons, or other prohibited articles are not introduced.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Plant perimeter security systems upgrade, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho

2. Project No. 82-D-128

10. Details of Cost Estimate^{b/}

	Item Cost	Total Cost
a. Engineering, design and inspection at approximately 22% of construction costs, items b and c		\$ 850
b. Construction costs		2,340
1. Improvements to land: fencing, roads, etc.	\$550	
2. Building, 1700 sq. ft. @ \$217 a sq. ft.	370	
3. Special facilities: new perimeter alarms, data processor, communication link interface equipment, etc.	860	
4. Utilities: perimeter lights, etc.	560	
c. Standard equipment: alarm modules, CCTV equipment, etc.		1,600
d. Demolition and removals		10
		4,800
Subtotal.....		600
e. Contingency at approximately 13% of above costs		\$5,400
Total Project Cost		

11. Method of Performance

Design will be accomplished by negotiated architect-engineer contract and construction and procurement by fixed price contracts award on the basis of competitive bids, except for alarm equipment which will be Government Furnished Equipment.

^{b/} This cost estimate is based on a completed conceptual design and partial completion of both Title I (preliminary) and Title II (definitive) designs.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Plant perimeter security systems upgrade, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho

2. Project No. 82-D-128

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

	<u>Prior Years</u>	<u>FY 1982</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>Total</u>
A. Total Project Costs						
1. Total Facility Cost						
(a) Construction Line Item	\$ 0	\$ 247	\$ 739	\$2,000	\$2,414	\$5,400
(b) PE&D	0	0	0	0	0	0
(c) Expense Funded Equipment	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0
Total Facility Costs	0	247	\$ 739	2,000	2,414	5,400
2. Other Project Costs						
(a) R&D necessary to complete construction	220	0	0	0	0	220
(b) Other Project Related Costs	0	200	385	190	380	1,155
Total Other Project Costs	220	200	385	190	380	1,375
Total Project Costs	\$ 220	447	1,124	2,190	\$2,794	\$6,775
B. Other Related Funding Requirements						
1. Facility Operating Costs				\$ 160		
2. Programmatic Operating Expenses Directly Related to the Facility				0		
3. Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility				0		
4. GPP or Other Construction Related to Programmatic Effort in the Facility				0		
5. Other Costs				0		
Total Other Related Annual Funding Requirements				\$ 160		

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CONSTRUCTION PROJECT DATA SHEET

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1. Title and location of project: Plant perimeter security systems upgrade, Idaho Fuels Processing Facility, Idaho National Engineering Laboratory, Idaho
2. Project No. 82-D-128
-

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

A. Total Project Costs

1. Total Facility

- a. Construction Line Item - no narrative required.
- b. PE&D - no narrative required.
- c. Expense Funded Equipment - no narrative required.
- d. Inventories - no narrative required.

2. Other Project Costs

- a. R&D Necessary to Complete - approximately \$220,000 was spent for conceptual design.
- b. Other Project Related Funding - approximately \$1,155,000 will be spent for project support during design and construction and for testing and startup of the completed facilities.

B. Other Related Funding Requirements

It is estimated the facility will be used 25 years for its programmatic purpose.

- 1. Facility Operating Costs - Facility operating costs amount to \$100,000 annually for electricity and \$60,000 annually for maintenance of electronic equipment.
- 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 Programmatic Effort - no narrative required.
- 5. Other Costs - no narrative required.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and location of project: Fuel Processing Facilities Upgrade Idaho Fuels Processing Facility, INEL, Idaho	2. Project No. 82-D-136
3. Date A-E work initiated: 2nd Qtr. FY 1982	5. Previous cost estimate: \$46,000 Date: 12/82
3a. Date physical construction starts: 4th Qtr. FY 1982	6. Current cost estimate: \$46,000 Less amount for PE&D: 0 Net cost estimate: \$46,000 Date: 12/83
4. Date construction ends: 4th Qtr. FY 1986	

7. Financial Schedule

<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Cost</u>
1982	\$40,000	\$10,500 ^{a/}	\$10,500 ^{a/}	\$ 1,053
1983	0	16,500 ^{b/}	16,500 ^{b/}	5,487
1984	6,000	18,000	18,000	10,200
1985	0	1,000	1,000	7,000
1986	0	0	0	22,260

8. Brief Physical Description of Project

The Idaho Fuels Processing Facility (IFPF) supports the nation's defense by processing naval nuclear propulsion fuels and thus closes the Navy's fuel cycle while providing fuel for the DOE production reactors. The Navy has forecasted a forty-year mission for the IFPF which will increase its base processing load substantially beyond present capacity.

^{a/}\$3,500,000 of FY 1982 Appropriation of \$14,000,000 temporarily reprogrammed to Project 81-D-143, L Reactor Upgrade. Funds were returned in FY 1983.

^{b/}Reflects a reprogramming of \$1,000,000 of FY 1983 funds to Project 82-D-128, Plant Perimeter Security System Upgrade.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Facilities Upgrade,
Idaho Fuels Processing Facility, INEL, Idaho	2. Project No. 82-D-136

8. Brief Physical Description of Project (cont'd)

This project addresses certain high priority requirements identified for interim, reliable nuclear fuel processing at IFPF by providing for Title I and Title II design, Advance Procurement, Title III Inspection, and Construction of systems and facilities urgently needed for the continued safe and orderly operation of the IFPF. Specifically, the project will provide the following: (1) refurbishment of the main stack, (2) modification of the off-gas system, (3) modification of the Process Equipment Waste (PEW) system, (4) upgrade of the existing product denitration system, (5) replacement of key non-geometrically safe vessels with critically safe vessels, and (6) construction of an improved solvent treatment system; (7) upgrade of process sampling and transfer systems; and (8) upgrade of various waste systems.

Support systems (e.g., utilities, instrumentation, etc.) will be provided such that all modifications will be fully operable at construction completion. Design will consider future expansion plans and will be compatible with these plans to the greatest practicable extent and will include Title I studies to confirm future interfaces.

The budget authority level requested in FY 1985 is for continuation of facility procurement and construction activities.

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

This project is needed to immediately correct problem areas which exist at the IFPF. Without these upgrades, long-term use of the IFPF may be jeopardized by increasing safety and reliability problems and concerns. A modification to the existing processing facility will be proposed in the near future which will safely and efficiently meet the long-term mission.

The existing IFPF processing facility was constructed 25 years ago and several plant systems have deteriorated through normal wear and corrosion. This deterioration decreases the safety, reliability, functional use, and efficiency of several process systems. This project is needed to preclude the following occurrences: (1) prolonged shutdown of the IFPF due to an inadvertent criticality, (2) prolonged shutdown of the IFPF due to failure of a key equipment item, (3) accumulation of personnel radiation exposure beyond as-low-as-reasonably-achievable levels (ALARA), and (4) unacceptable safety risks due to previously described items (1), (2), and (3). Loss of a key process would prevent operation of other critical IFPF processes and seriously impair the ability to process nuclear fuel. Such a shutdown would preclude recovery of valuable enriched uranium resources and the return of these resources to productive use.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Facilities Upgrade,
Idaho Fuels Processing Facility, INEL, Idaho

2. Project No. 82-D-136

9. Purpose, Justification of Need for, and Scope of Project (cont'd)

Structural modifications to the stack are necessary for continued operation of the IFPF. The existing 25-year-old reinforced concrete stack at IFPF has deteriorated from acid attack and has many hairline cracks. Mortar bonding between some of the acid-proof bricks in the stack liner is missing or badly deteriorated which could allow the bricks to fall out and corrosive gases to enter the annular space between the liner and concrete support shell with subsequent attack on the concrete. Core sections removed from the stack in 1978 allowed both visual observation and structural evaluation of the damage and indicated marginal structural integrity. Therefore, emergency repairs to temporarily stabilize the stack have been made. This project will provide for the structural strengthening of the existing chimney to satisfy current seismic standards as well as stabilization of the existing brick liner.

The existing off-gas system no longer operates with the margins of safety and reliability considered appropriate for IFPF missions. For example, the Process Building process off-gas systems filtration has been a significant source of personnel radiation exposure when the plant is operating. Presently, the filters become loaded and require replacement every three to five days. Filter changeout is done manually resulting in near unacceptable operating and maintenance personnel radiation exposure. The existing process off-gas system uses the Atmospheric Protection System (APS) as primary filtration. Because the APS has been used for primary protection, the APS prefilter has accumulated considerable contamination. It has no means of internal decontamination, thus, the radiation levels in the prefilter room have risen. Also, the valves, instrumentation, and other routinely used equipment are located (operable and readable) only in the prefilter room adjacent to the prefilter. Both situations result in repeated radiation exposure to operating and maintenance personnel.

The Process Equipment Waste (PEW) evaporator feed tank provides the sole source of surge capacity for the Process Equipment Waste/Cell Floor Drain (PEW/CFD) transfer system. If it were to fail, it would necessitate complete shutdown of the IFPF aqueous liquid waste system. The tank has received corrosive solutions containing undissolved solids for more than 25 years. There is no usable personnel access, decontamination capability, inspection capability, or solids removal capability for this vessel. This has resulted in the undesirable existing conditions:

- (1) The usable storage volume of the tank has been reduced by 15% due to accumulation of the undissolved solids received by the vessel.
- (2) The integrity of the tank wall is unknown because the effects of the corrosive solutions to which it has been exposed are not easily determined.

The existing product denitration system has a primary system vessel which is not critically-safe by geometry. The operating reliability is poor; there have been minor accidental contaminations of working areas. In addition, the process instrumentation is old and is located adjacent to the denitration vessel in a contamination-prone area.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Facilities Upgrade,
Idaho Fuels Processing Facility, INEL, Idaho

2. Project No. 82-D-136

9. Purpose, Justification of Need for, and Scope of Project (cont'd)

There are systems in which criticality safety is a concern. For example, the existing uranium salvage vessels are made critically safe by using internal boron poison plates. These poison plates may be partially dissolved by corrosion due to chemicals used in the system. Since no practical method is available to evaluate the poison and vessel integrity on a routine basis, projections of the vessel and poison life are not available. In some of the systems the instrumentation used for process control is outmoded and subject to malfunction, thus accountability and inventory control may be compromised.

The present solvent treatment system generates unnecessarily large quantities of spent solvent and permits discharge of residual amounts of radionuclides. The improved solvent treatment system will cleanup this exhaust.

Selected process sampler systems will be replaced to provide structures, samplers and transfer systems capable of increasing radiation and contamination control and safety while obtaining and transferring samples to the analytical laboratory.

Replacement of the plant's westside service waste control equipment and piping is needed to reduce the risk of an accidental discharge of contaminated waste to the percolation pond. In addition, emergency power will be provided to the westside service waste pumps.

10. Details of Cost Estimate^{b/}

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at approximately 34% of construction costs, item b		\$ 10,500
b. Construction costs		30,550
(1) Stack	\$ 6,620	
(2) Solvent Treatment System	360	
(3) Atmospheric Protection System	2,050	
(4) Process Equipment Waste System	2,600	
(5) Rework Cell Vessels	3,470	
(6) Denitration System	2,075	
(7) Vessel Off-Gas	110	

^{b/}The above estimates are based on a composite of actual bids, actual costs, completed definitive designs, and completed conceptual designs.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Facilities Upgrade,
Idaho Fuels Processing Facility, INEL, Idaho

2. Project No. 82-D-136

10. Details of Cost Estimate (cont'd)

(8) Remote Sampling and Transfer System	1,165
(9) Waste Systems Upgrade	3,100
(10) Glove Box Sampling and Transfer System	4,600
(11) Second and Third Cycle Raffinate Upgrade	3,300
(12) WC-114 Evaporator Upgrade	1,100

Subtotal

\$ 41,050

c. Contingency at approximately 12% of above cost

4,950

Total Project Cost

\$ 46,000

11. Method of Performance

Design, construction and procurement will be accomplished by prime contracts and/or subcontracts awarded on the basis of competitive bidding.

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

	<u>Prior Years</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>Total</u>
A. Total Project Funding							
1. Total Facility Cost							
a. Construction Line Item	\$ 1,053	\$ 5,487	\$10,200	\$ 7,000	\$22,260	\$ 0	\$ 46,000
b. PE&D	0	0	0	0	0	0	0
c. Expensive Funded Equipment	0	0	0	0	0	0	0
d. Inventories	0	0	0	0	0	0	0
Total Facility Costs	\$ 1,053	\$ 5,487	\$10,200	\$ 7,000	\$22,260	\$ 0	\$ 46,000

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Facilities Upgrade,
Idaho Fuels Processing Facility, INEL, Idaho

2. Project No. 82-D-136

12. Funding Schedule of Project Funding and Other Related Funded Requirements (cont'd)

	<u>Prior Years</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>Total</u>
2. Other Project Funding							
a. R&D Necessary to complete construction	\$ 3,157	\$ 280	\$ 160	\$ 60	\$ 30	\$ 0	\$ 3,687
b. Other Project Related Costs	863	825	1,992	3,300	3,770	1,150	11,900
Total Other Project Funding	<u>\$ 4,020</u>	<u>\$ 1,105</u>	<u>\$ 2,152</u>	<u>\$ 3,360</u>	<u>\$ 3,800</u>	<u>\$ 1,150</u>	<u>\$ 15,587</u>
Total Project Funding (Items 1 & 2)	\$ 5,073	\$ 6,592	\$12,352	\$10,360	\$26,060	\$ 1,150	\$ 61,587

B. Total Related Funding Requirement

1. Facility Operating Costs	\$ 0*
2. Programming Operating Expenses Directly Related to the Facility	0*
3. Capital Equipment not Related to Construction but Related to the Programmatic Effort in the Facility	0*
4. GPP or other construction related to Programmatic Effort in the Facility	0*
5. Other Costs	0*
Total Other Related Annual Funding Requirements	\$ 0*

*Operating costs and programmatic costs for the upgraded processing facility will not change from that presently budgeted for the existing processing facility.

CONSTRUCTION PROJECT DATA SHEET

1. Title and location of project: Fuel Processing Facilities Upgrade,
Idaho Fuels Processing Facility, INEL, Idaho

2. Project No. 82-D-136

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

A. Total Project Funding

1. Total Facility

- a. Construction Line Item - No narrative required.
- b. PE&D - No narrative required.
- c. Expense Funded Equipment - No narrative required.
- d. Inventories - No narrative required.

2. Other Project Funding

- a. R&D necessary to complete construction - Approximately \$3,100,000 was expended on conceptual design and an approximate additional \$587,000 will be needed to support process development R&D and facilities mockups.
- b. Other Project Related Funding - Approximately \$11,900,000 will be spent on project support and facility startup. Project Support will extend through design and construction. Project support includes design reviews, independent checks and calculations, trade-off studies, safety analysis report preparation, vendor data review and procurement support.

B. Total Related Funding Requirements

No incremental change in funding is required for programmatic operation of the upgraded facility.

Department Of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Materials Production

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

1. Title and Location of Project: Special plutonium recovery facilities,
JB-Line, Savannah River, South Carolina

2. Project No: 82-D-201

3. Date A-E Work Initiated: 1st Qtr. FY1983

5. Previous Cost Estimate: \$67,800
Less amount for P&ED 2,000
Net Cost Estimate: \$65,800
Date: 5/82

3a. Date Physical Construction Starts: 3rd Qtr. FY1983

6. Current Cost Estimate: \$67,800
Less amount for PE&D 2,000
Net Cost Estimate: \$65,800
Date: 8/83

4. Date Construction Ends: 1st Qtr. FY1987

7. Financial Schedule

Fiscal Year	Authorization	Appropriations	Obligations	Cost
1982	\$ 2,000	\$ 0	\$ 0	\$ 0
1983	9,000	11,000	11,000	5,735
1984	26,000	26,000	26,000	14,000
1985	28,800	28,800	28,800	19,745
1986	0	0	0	19,500
1987	0	0	0	6,820

8. Brief Physical Description of Project

The proposed facility will be an approximately 193,000 cubic foot, one-story, earthquake and tornado resistant structure adjoining the existing JB-Line located on top of the F-Area Separations Facility Building. New equipment will be installed in the facility to store, assay, size reduce, screen, oxidize, and dissolve recoverable solids, and to filter and purify the resultant solution prior to recycling to production streams. Equipment to assay and clean waste will also be provided. Necessary auxiliary equipment for room and glove box ventilation, air sampling, fire detection and suppression, process vacuum, nuclear incident monitoring, and other similar functions will be included. A new 210,000 cubic foot, one-story frame and siding structure with auxiliary equipment for emergency power and chemical preparation and with change facilities, lunchroom, offices and a personnel elevator for operations personnel will be constructed on top of the earthquake-resistant structure.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Special plutonium recovery facilities,
JB-Line, Savannah River, South Carolina

2. Project No: 82-D-201

8. Brief Physical Description of Project (Cont'd)

The existing air filter system does not have adequate capacity to handle the exhaust from the new recovery facility. Therefore, a new filter system will be constructed to allow removal of part of the existing load. The new system will be sized for 40,000 cfm of flow and will consist of an 85 ft. wide by 100 ft. long by 20 ft. high sand filter, fan house, exhausters, and a 90 ft. high stack. The sand filter will be located north of Building 235-F.

The funds being requested in FY 1985 will be used to complete construction.

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

The existing special recovery facility was originally installed as a temporary expedient to process a limited quantity of scrap. It was not designed for the long term use that has occurred nor the higher radiation level materials that have had to be processed. Control of contamination, radiation, and maintenance scheduling requires ever increasing supervisory effort to assure safe operation. High radiation levels together with shielding that is inadequate to meet present standards, limits the time personnel can perform operational and maintenance functions. Employees must therefore be rotated to other assignments to maintain their exposures to below the guide limits. The new facilities will allow personnel exposures to be maintained at less than 1 rem/yr without the necessity of rotating personnel.

Additional storage and processing capacity provided in the new facility will increase blending capability, in which high purity plutonium is blended with non-weapons grade plutonium to yield weapons grade material. The weapons grade plutonium will be converted to metal and used to meet defense program requirements. Capacity will also be provided to process Pu-239 scrap to make the plutonium available to meet defense requirements. Facilities to size reduce and oxidize scrap are not available in the existing facility, and as a consequence, certain forms of scrap cannot be processed. Increased capability to handle scrap is required.

When the existing recovery facilities were installed, they were connected to JB-Line service systems, such as solution transfer vacuum, vessel vent vacuum, cabinet ventilation, etc. These systems were designed to support the mainline process and no significant capacity modifications were made. These systems can neither adequately nor reliably support the present operations.

Equipment for cleaning process generated waste such as filters, rag, gloves, tools, etc., does not exist in the present facility. As a result, significant quantities of plutonium must be sent to retrievable storage. Since Federal policy is to reduce the amount of transuranic contaminated waste generated for storage, waste handling facilities are required.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Special plutonium recovery facilities,
JB-Line, Savannah River, South Carolina

2. Project No: 82-D-201

10. Details of Cost Estimate^{a/}

	<u>Item Cost</u>	<u>Total Cost</u>
A. Engineering Design & Inspection at approximately 29% of Construction Costs, Item B.....		\$ 12,880 ^{b/}
B. Construction Costs.....		45,122
1. Improvements to Land.....	0	
2. Buildings.....	\$13,555	
a) Process and Support Structures...9,050		
b) 235-F Sand Filter.....4,505		
3. Special Facilities.....	27,927	
a) Ventilation and Air Monitoring Systems..... 4,656		
b) Process Equipment.....18,342		
c) Fire Detection System..... 770		
d) Control Rooms..... 4,159		
4. Utilities.....	3,640	
a) Safeguards..... 285		
b) Communications system..... 130		
c) Electrical Power..... 2,015		
d) Water and Sewer Systems..... 1,210		
C. Removal Costs.....		159
Subtotal.....		<u>58,161</u>
D. Contingency at approximately 13% of above costs.....		<u>7,639</u>
Total Project Cost.....		\$ 65,800

^{a/} Based on design and construction progress through 9/83.

^{b/} Excludes \$2,000,000 in Plant Engineering and Design.

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Special plutonium recovery facilities,
JB-Line, Savannah River, South Carolina

2. Project No: 82-D-201

11. Method of Performance

Design will be performed by the operating contractor. Construction and procurement will be accomplished utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

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

	Prior Years	FY1983	FY1984	FY1985	FY1986	FY 1987	TOTAL
A. Total Project Funding							
1. Total Facility Costs							
a. Construction Line Item.....	\$ 0	\$ 5,735	\$14,000	\$19,745	\$19,500	6,820	\$65,800
b. PE&D.....	530	1,246	224	0	0	0	2,000
c. Expense Funded Equipment....	0	0	0	0	0	0	0
d. Inventories.....	0	0	0	0	0	0	0
Total Facility Costs.....	\$ 530	\$ 6,981	\$14,224	\$19,745	\$19,500	\$ 6,820	\$67,800
2. Other Project Funding							
a. R&D.....	\$2,830	\$ 1,200	\$ 700	\$ 100	\$ 65	\$ 0	\$ 4,895
b. Other Project Related Cost..	360	440	590	1,030	720	0	3,140
Total Other Project Funding.	\$3,190	\$ 1,640	\$ 1,290	\$ 1,130	\$ 785	0	\$ 8,035
Total Project Funding.....	\$3,720	\$ 8,621	\$15,514	\$20,875	\$20,285	\$ 6,820	\$75,835

B. Total Related Funding Requirements (Estimated Life of Project is 20 years)

	Annual Cost
1. Facility Operating Costs	\$1,900
2. Programmatic Operating Expense Directly Related to the Facility.....	1,950
3. Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility	50
4. GPP or Other Construction Related to the Programmatic Effort in in the Facility.....	50
5. Other Costs.....	0
Total Other Related Annual Funding Requirements.....	\$3,950

CONSTRUCTION PROJECT DATA SHEET

1. Title and Location of Project: Special plutonium recovery facilities,
JB-Line, Savannah River, South Carolina

2. Project No: 82-D-201

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

A. Total Project Funding

1) Total Facility Costs

- a. Construction Line Item - No Narrative Required.
- b. PE&D - Provided in FY1982.
- c. Expense Funded Equipment - None Required
- d. Inventories - None Required

2) Other Project Funding

- a. R&D - Includes \$1,450,000 R&D and \$3,445,000 of conceptual design and engineering studies.
- b. Other Project-Related Costs - Plant liaison.

B. Total Related Funding Requirements

- 1) Facility Operating Costs - Includes costs of labor, material and utilities for 7-day week, 4-shift schedules.
- 2) Programmatic Operating Expenses Directly Related to the Facility - Change or cost of operating overhead associated with the Special Recovery Facility.
- 3) Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility - Estimated cost to replace capital equipment such as pumps, tanks, agitators, etc.
- 4) GPP or Other Construction Related to Programmatic Effort - Cost to update or improve items.
- 5) Other Costs - None

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Department of Energy

FY 1985 CONGRESSIONAL REQUEST

OPERATING EXPENSE FUNDED PROJECT DATA SHEET
Defense Program

Atomic Energy Defense Activities Construction
Atomic Energy Defense Activities
Nuclear Materials Production

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

Fuel Fabrication Area Seepage Basin Phaseout
Savannah River Plant
Savannah River Operations Office

Total Estimated Cost (TEC) \$40,000,000
(For Design and Construction)

Fuel Fabrication Area Seepage Basin Phase-Out
Savannah River Operations Office

Total Estimated Cost (TEC) \$40,000,000

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

	Cumulative Prior Years OBS	FY 1983 Actual			FY 1984 Estimate	
		B/A	OBS	B/O	B/A	B/O
<u>Operating Expenses (DOE):</u>						
Design and construction	\$ -	\$ -	\$ -	\$ -	\$ 15,000 ^{a/}	\$ 15,000
R&D related to construction	-	-	-	-	-	-
Facility operations	-	-	-	-	-	-
Direct project related support costs	-	-	-	-	-	-
Capital equipment	-	-	-	-	-	-
Total Operating Expenses	-	-	-	-	\$ 15,000	\$ 15,000
<u>Other DOE Costs</u>	-	-	-	-	-	-
<u>Total DOE Costs</u>	-	-	-	-	\$ 15,000	\$ 15,000
<u>Non-DOE Costs</u>	-	-	-	-	-	-
<u>Total Project Costs</u>	-	-	-	-	\$ 15,000	\$ 15,000

^{a/} FY 1984 BA to be obtained through proposed budget supplement.

Fuel Fabrication Area Seepage Basin Phase-Out
Savannah River Operations Office

Total Estimated Cost (TEC) \$40,000,000

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

	FY 1985 Estimate		FY 1986 Estimate		Total Project Cost
	B/A	B/O	B/A	B/O	B/A
<u>Operating Expenses (DOE):</u>					
Design and construction	\$ 25,000	\$ 25,000	\$ -	\$ -	\$ 40,000
R&D related to construction	-	-	-	-	-
Facility operations	-	-	-	-	-
Direct project related support costs	-	-	-	-	-
Capital equipment	-	-	-	-	-
<u>Total Operating Expenses</u>	\$ 25,000	\$ 25,000	-	-	\$ 40,000
<u>Other DOE Costs</u>	-	-	-	-	-
<u>Total DOE Costs</u>	\$ 25,000	\$25,000	-	-	\$ 40,000
<u>Non-DOE Costs</u>	-	-	-	-	-
<u>Total Project Costs</u>	\$ 25,000	\$25,000	-	-	\$ 40,000 ^{b/}

^{b/} Preliminary estimate based on approximately 40% conceptual design. Definitive figures will be available March 1984.

Fuel Fabrication Area Seepage Basin Phase-Out
Savannah River Operations Office

Total Estimated Cost (TEC) \$40,000,000

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

Description, Objective and Justification

At present, liquid effluents leaving the 300-M Area are handled in one of two ways: clean cooling water is sent to Tim's Branch and liquid wastes from the process go to a settling basin. The materials sent to the basin react with one another in what is essentially a neutralization/precipitation process which results in a basin pH of about 9.0-10.0. This high pH causes the bottom of the basin to remain somewhat impervious to seepage. On occasions the basin has overflowed to a seep area to the south known as Lost Lake. Lost Lake is a natural formation, a carolina bay, with no outfall or overflow.

This project is composed of four subprojects, Waste Solidification Facility (\$16,000,000), Wastewater Recycle (\$10,500,000), 300-M Area Waste Water Reduction (\$1,500,000) and Uranium Recovery (\$12,000,000). These subprojects propose to demonstrate a process by which: 1) concentrated uranium in solution is removed and recycled to the supplier or, if it has no economic value, buried; 2) acid solutions are recovered and recycled wherever possible; 3) caustic solutions, where they are not necessary to neutralize acid for uranium precipitation, are fixed and buried; 4) impurities, including uranium, are removed from rinsewater, and the rinsewater recycled back into the process; and 5) rinsewater discharge volume to the process sewer is significantly reduced.

The work permits 300-M Area to terminate use of the settling basin by March, 1985. This is in response to a congressional amendment to a DOE FY 1984 funding supplement that directed termination of the fuel fabrication area seepage basins. It eliminates a major source for contamination of groundwater from liquid wastes originating in the 300-M area. It also reduces to some extent, hydraulic loadings on the groundwater below the basin, known to be contaminated with chlorinated hydrocarbons.

(a) Schedule of Planned Activities

<u>Activity</u>	<u>Start</u>	<u>Complete</u>
Develop Basic Data & TDS	9/83	11/83
Limiting Material Procurement	3/84	9/84
Facility Construction	6/84*	2/85
Checkout and Startup	3/85	3/85

* Initial construction to begin in January, 1984 on Waste Water Reduction Subproject upon advance authorization of \$800,000.

Fuel Fabrication Area Seepage Basin Phase-Out
Savannah River Operations Office

Total Estimated Cost (TEC) \$40,000,000

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

Description, Objective and Justification - (Cont'd)

(b) Management and Contracting

Design will be by the operating contractor. Construction and procurement will be by the operating contractor utilizing, to the extent feasible, fixed-priced subcontracts awarded on the basis of competitive bidding.

(c) Prior Year Achievements

Bench scale tests of the uranium removal process portion of this project and approximately 10% design were completed.

(d) CY Achievements

It is anticipated that design will be finalized, long delivery components ordered and delivered, and construction started.

(e) Reasons for Increases and Decreases

No prior funding for this project has been forecast.

(f) Details of Cost Estimate b/

(Dollars in thousands)		
	<u>Item Cost</u>	<u>Total Cost</u>
1. Engineering design & inspection at approximately 21% of construction costs, Item 2.....		\$ 6,000
2. Construction Costs.....		29,000
(a) Buildings.....	\$ 4,000	
(b) Special facilities.....	23,220	
(c) Utilities.....	1,780	

b/ Preliminary estimate, based on approximately 40% conceptual design. Definitive figures will be available March 1984.

Fuel Fabrication Area Seepage Basin Phase-Out
Savannah River Operations Office

Total Estimated Cost (TEC) \$40,000,000

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

(f) Details of Cost Estimate - (Cont'd)

	(Dollars in thousands)
<u>Item Cost</u>	<u>Total Cost</u>
3. Removal costs.....	\$ 1,000
Subtotal (Items 1, 2, & 3).....	<u>36,000</u>
4. Contingencies at approximately 11% of above costs.....	<u>4,000</u>
Total Project Cost.....	\$ 40,000

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DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
DEFENSE WASTE AND BYPRODUCTS MANAGEMENT
Atomic Energy Defense Activities
(Tabular dollars in thousands. Narrative material in whole dollars.)

	<u>FY 1983 Appropriation</u>	<u>FY 1984 Appropriation</u>	<u>FY 1985 Base</u>	<u>FY 1985 Request</u>
<u>Defense Waste and Byproducts Management (DP)</u>				
Operating Expenses:				
Interim Waste Operations	\$200,968	\$221,026 <u>a/</u>	\$221,026	\$240,400
Long-Term Waste Management Technology	53,311	64,604	64,604	90,400
Terminal Storage	14,000	27,800	27,800	25,800
Byproducts and Beneficial Use	1,650 <u>b/</u>	10,000	10,000	0
Program Direction	<u>2,000</u>	<u>2,470</u>	<u>2,470</u>	<u>2,100</u>
Total Operating Expenses	\$271,929	\$325,900	\$325,900	\$358,700
Capital Equipment	\$ 31,605	\$ 34,500	\$ 34,500	\$ 35,771
Construction	<u>\$215,195</u>	<u>\$320,700</u>	<u>\$320,700</u>	<u>\$358,300</u>
Total Defense Waste and Byproducts Management	<u>\$518,729</u>	<u>\$681,100</u>	<u>\$681,100</u>	<u>\$752,771</u>
Staffing Total FTE's	164	149	122	122
Headquarters	40	41	41	41
Idaho	124	108	81 <u>c/</u>	81 <u>c/</u>

Authorization: Section 1, Public Law 83-703

a/ Includes \$11,700,000 of site specific technologies transferred to Long Term Waste Technology in FY 1985.

b/ Reflects allocation of FY 1983 Appropriation from Long-Term Waste Technology to be consistent with FY 1984 Appropriation structure.

c/ Reflects achieving a goal of reduced personnel by implementing management savings.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF CHANGES
DEFENSE WASTE AND BYPRODUCTS MANAGEMENT
(dollars in thousands)

FY 1984 Appropriation enacted	\$ 681,100
Built in increases and decreases	0
FY 1985 base	\$ 681,100
Program increases and decreases:	
o Escalation increase for operating, equipment, and general plant project funds	+ 23,631
o Continue surveillance and maintenance of defense surplus facilities, and disposition projects initiated at Mound, Oak Ridge National Laboratory (ORNL), Idaho National Engineering Laboratory (INEL), and Hanford in previous years	+ 3,628
o Continue minimum operations at Hanford, with the transfer of high-level and TRU waste site-specific technology to Long-Term Waste Management Technology program	- 20,817
o Continue essential operations at the Oak Ridge National Laboratory (ORNL), the Feed Materials Production Center (FMPC), and other sites, landlord requirements support at Hanford and INEL, and operational support for the DOE-wide Transportation Operations and Traffic Management Program at all sites	- 1,440
o Continue operations at INEL including operation of the New Waste Calcining Facility (NWCF) and the Waste Experimental Reduction Facility (WERF), and provide environmental monitoring to assure no radionuclide migration from burial grounds	+ 5,985
o Continue operations at Savannah River including the planned waste transfer program to: (1) optimize the interface with the Defense Waste Processing Facility (DWPF) Project; and (2) remove waste from the single-shell and badly cracked tanks by FY 1988.	+ 17,874
o Provide critical programmatic equipment at all sites and critical landlord equipment at Hanford and INEL	- 1,216
o Provide critical general plant projects to support programmatic activities at Los Alamos National Laboratory (LANL), Hanford, INEL, ORNL, FMPC, and Savannah River, and to support landlord activities at Hanford and INEL	+ 1,497
o Complete prior year projects: Hanford Rail Replacement Project and Radioactive Waste Facilities Improvements Project at ORNL	- 7,000
o Continue Waste Handling and Isolation Facilities project at Hanford consistent with stabilization and isolation of old single shell tanks	+ 6,130

o Complete construction of new double shell waste tanks at Hanford for storage of waste from the restart of PUREX, waste from other nuclear operations, and waste transferred from old tanks	- 27,845
o Initiate construction of Seventh Calcined Storage Facility at INEL to support continued ICPP operations (TEC \$24M).....	+ 7,000
o Initiate design and construction of a new Central Warehouse Facility at Hanford since the old one is beyond economical repair (TEC \$13M).....	+ 700
o Initiate design and construction of a new waste transfer facility at Savannah River to continue safe H-Area tank farm operations and to interface with the DWPF (TEC \$45M).....	+ 11,000
o Initiate design and construction of security systems improvements at the Test Reactor Area at INEL (TEC \$7M)	+ 2,000
o Continue evaluation of long-term management options for high-level waste at Richland and Idaho, with transfer of site specific technology from Interim Waste Operations Program	+ 6,400
o Reduce HLW Technology support at SR for DWPF	- 2,085
o Continue TRU waste management activities with increased funding for transportation systems, supporting activities for the Stored Waste Examination Pilot Plant at Idaho, in-situ vitrification at Richland, and other integration activities which support the Defense Waste Management Plan and DOE Order 5820.1 requirements	+ 4,934
o Increase R&D support for TRU transportation systems	+ 211
o Closeout airborne waste technology program	- 895
o Reduce low-level waste technology activities in support of DOE burial ground operations	- 1,587
o Continue construction of Defense Waste Processing Facility (DWPF) at Savannah River to immobilize high-level waste for disposal, leading to completion and "hot" operation in FY 1989 as scheduled	+ 106,743
o Maintain schedule for the Processing Experimental Pilot Plant (PREPP) and Stored Waste Examination Pilot Plant (SWEPP)	+ 4,810
o Complete efforts to develop beneficial uses for defense byproducts with future efforts funded by users	- 15,600
o Continue the Waste Isolation Pilot Plant (WIPP) Project to allow operation in 1988 as scheduled	- 52,017
o Provide funding for 41 full-time equivalent personnel at Headquarters	- 370
FY 1985 Request	\$ 752,771

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
DEFENSE WASTE AND BYPRODUCTS MANAGEMENT

Program Overview

The goal of the Defense Waste and Byproducts Management (DWBM) program is to provide for safe interim storage or utilization of radioactive waste and byproducts generated primarily from nuclear materials production and naval propulsion while continuing the development of technologies and facilities for the final disposal of defense waste.

The program has three primary elements: Interim Waste Operations, Long-Term Waste Management Technology, and Terminal Storage. These elements provide mainly for the handling and disposal of low-level and airborne radioactive waste, the storage of transuranic and high-level waste, development of technology for the long-term management of radioactive waste, and the demonstration of the safe disposal of defense waste. The FY 1985 budget supports the implementation of the policies contained in the Defense Waste Management Plan which was prepared in response to PL 97-90 and signed by the President on June 16, 1983.

Fiscal year 1985 efforts in the Interim Waste Operations program will continue the upgrading of waste handling, storage, and disposal operations by transferring high-level waste from old single-shell tanks at Savannah River and Hanford into new double-shell tanks, construction of new facilities, improvement in existing facilities, upgrading of burial ground operations, and the management of defense surplus facilities. The long-term program in FY 1985 will focus on the construction of the Defense Waste Processing Facility (DWPF) at Savannah River, construction of the Waste Isolation Pilot Plant (WIPP), and preparation of transuranic waste at Idaho and other DOE sites to meet WIPP waste acceptance criteria.

The Defense Waste Processing Facility (DWPF) will provide the final step in processing high-level waste at Savannah River for disposal. Facility construction began in FY 1984 leading to "hot" operations in FY 1989. The DWPF will immobilize the high-level waste (HLW) in borosilicate glass for storage, transportation to, and disposal in a geologic repository. Immobilization and confinement in a repository will ensure the long-term isolation of this waste from the environment with minimal maintenance and surveillance.

The Waste Isolation Pilot Plant, located near Carlsbad, New Mexico, will demonstrate the safe disposal of defense nuclear waste. The WIPP facilities will be capable of routine operations to receive, inspect, and emplace defense nuclear waste in a geologic disposal environment. This research and development facility will be sized to handle quantities typical of defense nuclear waste inventories and anticipated generation rates. Emplacement of radioactive waste in WIPP will begin in late 1988.

This decision unit reflects \$-1,929,000 for savings resulting from management initiatives in the areas of administrative organization management, administrative systems and processes, payroll, personnel, procurement reform, printing and publications and travel management.

Justification

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Request</u>
<u>Operating Expenses</u>	\$ 325,900	\$ 358,700
<u>Interim Waste Operations</u>	\$ 221,026	\$ 240,400

The objective of the interim waste operations program is to provide safe processing and utilization, storage or disposal of DOE radioactive waste and byproducts. Waste management support is necessary for material production and naval reactor activities. The program includes the operation and maintenance of high-level waste (HLW) storage

tanks, bins, and related processing and storage facilities at Savannah River, Richland, and Idaho; the operation and maintenance of low-level waste (LLW) burial grounds at the Savannah River Plant, Oak Ridge National Laboratory, Feed Materials Production Center, Idaho National Engineering Laboratory, Hanford Reservation, Los Alamos National Laboratory (LANL), Sandia National Laboratory (SNLA), and Nevada Test Site (NTS); the retrievable storage of transuranic (TRU) waste at various sites; the operation of low-level and intermediate-level liquid waste facilities; the operation of three filter testing facilities; and the processing of low-level gaseous waste. Efforts are also underway to transfer HLW from old tanks at Savannah River and Hanford into new double shell tanks, to construct new and improved facilities, to improve burial ground operations, and to stabilize old burial ground areas to minimize the potential for radionuclide release to the environment. In addition, this program provides for the safe management and disposition of surplus radioactively contaminated DOE facilities at several sites that were used in support of defense programs.

Operations to process and store or dispose of radioactive waste from DOE defense and R&D programs, including necessary maintenance of facilities and environmental monitoring, must continue in order to assure the safe and environmentally acceptable conduct of DOE's mission. In addition, restoration is necessary to improve safety, minimize releases of radioactivity to the environment, and for cost-effective "landlord" operations at the Hanford Reservation and the Idaho National Engineering Laboratory.

The Interim Waste Operations program will also develop procedures for the certification of stored TRU waste for acceptance at the WIPP. Starting in 1984, many newly generated waste forms have been certified for WIPP and stored separately from the backlog of noncertified waste. In 1985, all routinely generated waste will be certified. The Interim Waste Operations program also supports site-specific technology development efforts, at various facilities, which support and provide improvements to current and planned low-level radioactive waste disposal operations.

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
a. Idaho National Engineering Laboratory (INEL), Idaho	\$ 34,460	\$ 42,650

The requested funds are primarily for operation of the high-level waste tank farm and the New Waste Calcining Facility (NWCF) at INEL. The NWCF converts liquid high-level radioactive waste from the Idaho Chemical Processing Plant (ICPP) to a granular solid suitable for interim storage in underground bins. The funding supports the operation of the INEL Radioactive Waste Management Complex (RWMC) for the receipt, handling, and routine disposal of low-level solid radioactive waste, and for the segregation and retrievable storage of transuranic-contaminated solid waste. This includes support of environmental monitoring and surveillance activities for the RWMC and the implementation of remedial actions indicated by the monitoring and surveillance programs as being necessary. An extensive program of rock fracturing and excavation to extend the lifetime of the burial ground facilities is also in progress.

Supporting activities include process development and conceptual engineering and design studies related to waste handling and treatment; the development and implementation of methods to assure that newly generated TRU waste is certified as meeting the waste acceptance criteria for the WIPP facility; the development and demonstration of retrieval and transfer techniques required to certify previously stored TRU waste; and the operation of a segregated storage area for certified waste; and other activities associated with the operation of the Stored Waste Examination Pilot Plant (SWEPP) and the Processed Waste Experimental Pilot Plant (PREPP).

Other activities at the INEL include volume reducing waste to extend the lifetime of the existing burial ground, and monitoring the ground water and stack effluents to assure there is no environmental impact from Defense activities. The increase in 1985 includes the first full year of operation of the contaminated metal and combustible waste volume reduction facility, the Waste Experimental Reduction Facility (WERF), including the fabrication of contaminated metal, previously designated as waste, into materials reusable within the Defense sector. The increase also provides for increased monitoring and modeling to assure that Defense activities are conducted in an environmentally safe manner.

	FY 1984 <u>Appropriation</u>	FY 1985 <u>Request</u>
b. Oak Ridge National Laboratory (ORNL), Tennessee	\$ 14,251	\$ 15,750

The requested funds provide for operation of the radioactive waste management facilities at ORNL, Oak Ridge, Tennessee, including the low- and intermediate-level liquid waste handling system; the laboratory ventilation system for gaseous radioactive waste; the burial grounds for the receipt, handling, and routine disposal of low-level solid waste; a storage facility for TRU solid waste; and the hydrofracture facility for the disposal of intermediate-level waste through injection of a cement grout into the shale formation underlying ORNL. Also included are supporting activities such as process development, engineering studies, and conceptual design related to waste handling at ORNL, and support of the Integrated Data Base (the authoritative source of DOE radioactive waste characteristics, inventories, and projections).

The requested funding also supports continuation of a program, begun in 1980, to develop and implement a management plan for the disposal or recycle of nearly 100,000 tons of contaminated metal scrap which has accumulated at all Oak Ridge Operations facilities. On-site size reduction and sorting of metal scrap from the Oak Ridge Gaseous Diffusion Plant (ORGDP) will be completed during FY 1984. In FY 1985-86, metal scrap from ORGDP will be decontaminated and size reduced by smelting, using the services of a commercial vendor either on or offsite, whichever is more cost-effective. Efforts will be made to recycle the smelted metal, within DOE, for beneficial use by other programs. Size reduction and sorting of metal scrap from Paducah will follow in FY 1987.

A major focus of the Interim Waste Operations program at ORNL in FY 1985 will be the continuation of efforts to characterize, site, design, and develop two new LLW disposal facilities. The first is a Central Waste Disposal Facility (CWDF), which will be used for the disposal of low specific activity LLW from all three Oak Ridge plants. Formal site selection will be made during FY 1984 and a conceptual design effort completed. During FY 1985, site geologic and hydrologic characterization and modeling will continue and all necessary safety and environmental documentation will be prepared. Detailed design efforts will begin, and the facility will be operational in 1990. The second facility, called Solid Waste Disposal Area-7 (SWDA-7), will be a small site, on the ORNL complex, for the disposal of high specific activity LLW generated at the laboratory. During FY 1985, site characterization efforts and experiments to determine the effects of forest clearing on water table levels will continue. A detailed facility engineering design will be completed. The facility will be operational in 1989. New disposal facilities are necessary because existing capacity at all three Oak Ridge plants will be exhausted by about 1990. If characterization efforts show that the CWDF is suitable for the disposal of high activity LLW, then plans to develop SWDA-7 will be discontinued.

The requested funding also continues efforts to develop cost-effective volume reduction methods to reduce burial ground usage and increase waste form stability at ORNL. This activity includes the operation of the electropolishing decontamination facility to decontaminate small items, for reuse or disposal as sanitary waste, which might otherwise require disposal as LLW; design of a pilot plant to biologically treat certain low-level waste; operation of the TRU waste drum assay facility; continuation of generator monitoring efforts to assure proper waste segregation; and a continued reduction in the rate of waste generation.

The increase in FY 1985 will support evaluation of the condition, and development of options for the disposition of six old gunite tanks at ORNL. Disposal of sludge from these old tanks, by hydrofracture, will be completed in early FY 1984. The requested increase will also support ORGDP's metal smelting operations.

	FY 1984 <u>Appropriation</u>	FY 1985 <u>Request</u>
c. Hanford Reservation, Washington	\$ 93,061	\$ 78,200

The requested funding is required for maintenance and operation of radioactive waste management facilities at the Hanford Reservation. The principal waste management activities include supporting operations of the PUREX facility; the stabilization and isolation of all 149 old single shell tanks; the surveillance and maintenance of all waste storage tanks (including 20 new double shell tanks); operation of waste handling, evaporation and fractionation facilities; completion in FY 1985 of the encapsulation of strontium previously removed from high-level waste; initiation of actions to place the B Plant, and its fractionation and encapsulation facilities, into a standby status (unless subsequent evaluations indicate the need to do otherwise); operation of solid waste burial grounds for the receipt, handling and disposal of low-level solid waste; and segregation and retrievable storage of TRU-contaminated solid waste. Also included are support activities such as process development, engineering studies, and conceptual design for improved waste handling practices and facilities; for surveillance of waste management facilities which are no longer in use; and for the cleanup and control of contaminated areas. Site common use inventories and process spares are also provided by this program.

The requested funding continues the stabilization and isolation of waste in single shell tanks. In this effort, supernatant liquid high-level waste and drainable interstitial liquid waste is transferred to new double shell tanks, leaving the crystalline salt cake and sludge. Piping and other connections to the old tanks are sealed pending the implementation of the long-term waste management program. The deactivation of all 149 old single shell tanks was completed in November 1980. Stabilization and isolation of waste in single shell tanks will be completed by the end of FY 1989. Also supported are the cleanup and stabilization of outdoor surface-contaminated areas.

Contaminated sites used for disposal of low-level waste by means of trenches, ditches, french drains, and ponds but not needed for current or projected operation are being stabilized to fix radionuclides in place. Techniques and procedures for stabilization are being demonstrated to minimize possible dispersal or radionuclide transport by flooding, erosion, vegetation growth, or animal activities. During the preceding several years, the interim waste operations program has supported site-specific development efforts at Hanford. These efforts have concentrated on making the transition from past disposal and interim storage practices to final disposal, including the following areas: the immobilization of HLW; the in-place stabilization of contaminated soil; the in-place stabilization of TRU waste buried prior to 1970; and the in-tank stabilization of waste in single shell tanks. In FY 1985, all HLW and TRU site-specific technology efforts will be transferred to the long-term technology program. This is the primary reason for the decreased funding shown.

d. Savannah River Plant, South Carolina	\$ 54,254	\$ 75,600
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The requested funding is required to operate radioactive waste management facilities at the Savannah River Plant (SRP). The principal activities include: processing and storage of HLW, surveillance and maintenance of waste tanks and supporting facilities including operation of the Waste Management Maintenance Facility, waste tank evaluation, waste concentration to reduce volume and mobility, and transfer of waste from old tanks to new double shell tanks; low-level liquid effluents management; operation of SRP burial grounds for the receipt, handling and disposal of low-level solid waste and the retrievable storage of transuranic solid waste and certification for WIPP; and support for improved waste handling practices and solid waste volume reduction efforts, including process development, engineering studies, and conceptual design.

The increased funding is required to maintain the waste transfer schedule to assure (1) removal of waste from old single shell and badly cracked tanks by FY 1988 and completion of the waste transfer program in FY 1994; and (2) sufficient interim waste operations program/DWPF project interface to assure adequate (2 years) of feed preparation and to avoid the need for new waste tanks.

To delay emptying the single shell and badly cracked tanks beyond FY 1988 will increase the potential for failure prior to and during transfer of the waste. The single wall tanks in particular present a potential risk in that there is no method to monitor for a leak on a real time basis or to recycle leakage. In order to meet the waste transfer schedule funding is required to design and construct sludge removal facilities for the tanks to be emptied, including installation of the superstructure over the tanks and installation of pumps and other removal equipment.

A significant process improvement was successfully demonstrated in FY 1982 in which sludge is prepared in an existing double shell tank for immobilization in the DWPF. This process reduces the volume of glass eventually produced in the DWPF by approximately 30% thereby decreasing the number of HLW canisters requiring lag storage and eventual shipment to a repository. In addition, by performing this process in an existing tank rather than in the DWPF, facility capital costs of approximately \$200 million are saved. It is necessary to upgrade the sludge processing demonstration facilities to a production mode prior to large-scale transfer operations. The processing rate for the sludge demonstration is 3,000 lbs. per day, whereas the full scale rate (feed to DWPF) is 11,400 lbs per day. Included in this upgrade are (1) procurement and installation of pumps, instrumentation and other equipment in processing Tank 42 and in Tank 51, which will be used to blend the sludges for feed to the DWPF; (2) upgrade of transfer facilities from F to H area, including transfer pumps and an inter-area sludge transport control network; and (3) upgrade of the process control room.

Funding is also requested for process development and installation of salt precipitation equipment and facilities in preparation for the transfer of decontaminated salt to the salt disposal facility included in the DWPF Project. The salt precipitation demonstration was successfully completed in FY 1983, and funding is required to design and efficiently install production-scale process equipment to provide feed for the salt disposal facility startup in FY 1989. Additional process development and design work is required to assure production scale facilities will operate efficiently.

	FY 1984 <u>Appropriation</u>	FY 1985 <u>Request</u>
e. Other Sites and Transportation Operations	\$ 5,622	\$ 7,650

DOE also operates solid radioactive waste management facilities at the Nevada Test Site (NTS), the Los Alamos National Laboratory (LANL), and the Sandia National Laboratory (SNL). The requested funding supports the receipt, processing, and disposal of low-level solid wastes at these sites and the segregation and retrievable storage of transuranic-contaminated solid waste at NTS and LANL; the consolidation of disposal sites at NTS; the stabilization of old burial grounds at LANL; supporting environmental and other site-specific studies; and the development of procedures to certify that newly generated TRU waste meets the waste acceptance criteria for the WIPP.

The increased funding is for radioactive waste management operations at the Feed Materials Production Center (FMPC), Fernald, Ohio which are assumed in FY 1985 by the DWBM program. These activities were previously funded by the Nuclear Materials Production program. The primary mission of the FMPC is to produce uranium billets and target elements for further fabrication and irradiation in Savannah River and Hanford production reactors. During routine operations both solid and liquid low-level radioactive waste is generated. Solid radioactive waste is disposed of in lined pits. Prior to 1983 liquid waste in the form of wet sludge was also disposed of in lined pits. In order to improve the safety and environmental acceptability of

waste disposal operations at FMPC, an interim program to dry the wet sludge in temporary facilities and store it in existing concrete silos was initiated. The requested funding supports continuation of disposal operations for dry solid waste in lined pits and for the interim storage of dried sludge in concrete silos. Options for disposal of the dried sludge will be developed, as will plans for permanent facilities to handle routinely generated wet sludge.

The requested funding also supports the Department-wide transportation operations and traffic management (TOTM) function which includes legislative and regulatory analyses; representation at litigation and rate hearings; support of hazardous materials compliance training required for DOE shippers and carriers; operation of the shipment mobility and accountability (SMAC) data system; support of the Transportation Review Group; and development and maintenance of a program for state, local, public and carrier acceptance with regard to nuclear shipments. The TOTM program will take actions in 1985 which will effect and maintain savings of approximately \$5 million annually in shipping costs Department-wide. These actions include solicitation of special motor and rail carrier, Section 10721 (Interstate Commerce Commission Act) quotations, and volume discount freight rates applicable to DOE facilities and contractor transports. Additionally, due to litigation/negotiation efforts with the nation's rail carriers on radioactive spent fuel movements for the naval propulsion program, TOTM expects a substantial roll back of rate levels at the Interstate Commerce Commission which will affect all DOE spent fuel programs. The funding supports implementation of the TOTM 5-Year Plan recommendations, including freight transportation performance base development and the TOTM certification program.

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Request</u>
f. Hanford Reservation, Landlord Support, Washington ..	\$ 7,500	\$ 3,000

The Hanford Landlord supports maintenance, repair, and replacement of general site support equipment and facilities at the Hanford Reservation such as utilities, roads, railroads, transportation and other heavy equipment and facilities. Operating funds are used for general purpose building and equipment maintenance, planning, engineering, and procurement associated with equipment replacement.

At the Hanford Reservation, many of the general support facilities and systems and most of the equipment is old and severely deteriorated. Failures are frequent and downtime is excessive. An upgrade program was begun in FY 1981 to restore operational safety, efficiency, and reliability to Hanford general support facilities and equipment and to complement the base support program at the site. The request supports completion of the upgrade program in FY 1988 and reflects the fact that most of the operating funded efforts (e.g. planning, scheduling, designing, etc.) in the upgrade program have been completed and the bulk of the remaining efforts are funded in the capital equipment and GPP categories.

g. Idaho National Engineering Laboratory, Landlord Support	\$ 1,378	\$ 2,750
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The requested funding provides support for non-programmatic conceptual design related to maintenance, repair, and replacement of general site support facilities such as utilities, roads, and service buildings. Much of the general purpose facilities and equipment at INEL fall well below minimum Government standards with respect to both age and physical condition. The requested funding permits a start at compliance with Federal requirements.

The increased funding in FY 1985 supports compliance with the DOE policy on maintenance inspections. It also supports the establishment of a landlord funded inspection, evaluation, and maintenance in the critical area of fire and security alarm systems.

	FY 1984 Appropriation	FY 1985 Request
h. Decontamination and Decommissioning	\$ 10,500	\$ 14,800

This program provides for the safe management and disposition of surplus radioactively contaminated DOE facilities originally used in support of defense programs. Approximately 200 defense facilities are now inventoried under this program including reactors, laboratories, reprocessing plants, and waste storage and disposal facilities. The inventory has been reduced by transferring a large number of contaminated areas at Hanford, which consists principally of contaminated soils, to the Interim Operations program for routine surveillance. All facilities which are to be decontaminated and decommissioned were used for defense activities and most (131) are located at the Hanford Site (Washington). Others are located at Oak Ridge National Laboratory (Tennessee), Idaho National Engineering Laboratory (Idaho), Mound Facility (Ohio), Knolls Atomic Power Laboratory--Knolls Site (New York), and the New Brunswick Laboratory Site (New Jersey).

Priorities for decontamination and decommissioning will stress the recovery of valuable materials, the beneficial reuse of facilities, and the avoidance of future maintenance costs while reducing potential health impacts. The Richland Operations Office is lead field office for this program. The objectives are: (1) to provide surveillance and maintenance to assure that surplus facilities remain in a environmentally safe condition until decommissioned or stabilized; (2) to develop assessments of the benefits and risks of immediate dismantlement vs. continued surveillance and develop plans for cost-effective reuse, maintenance, or decommissioning of the surplus facilities; and (3) to conduct selected projects to control or eliminate hazardous conditions, or to release facilities and equipment for reuse.

In prior years, the majority of available funding was used to support the mandatory maintenance and surveillance activities. This year funds are allocated for decommissioning deteriorated facilities (some of which were built 40 years ago) which will help reduce outyear maintenance work.

To continue surveillance and maintenance, and begin actual decommissioning of the 200 remaining defense facilities, an increased funding level is required in FY 1985. By performing the decommissioning work, future costs for surveillance and major maintenance will be reduced and facilities and equipment made available for reuse by other government programs.

In FY 1982 and FY 1983, for every dollar that was spent on decommissioning projects, three dollars were saved as a result of facility reuse. Such dramatic savings cannot be expected every year, but a major objective of this program is to maximize reuse of materials and facilities that are now surplus because they are contaminated.

The FY 1985 funding increase is to support the following ongoing disposition projects, which were initiated in FY 1983 and FY 1984:

- o Special Metallurgical Building at Mound - complete filter bank removal and continue detailed engineering and utility relocation. (reduce safety hazards and outyear surveillance and maintenance costs)
- o Fission Products Development Laboratory at ORNL - continue decommissioning process and manipulator cells 14 and 18, continue manipulator cells 13 and 15. (provide space for potential reuse)
- o Metal Recovery Facility at ORNL - complete site preparations, upgrade ventilation system, and initiate equipment removal from cells. (reduce safety hazards and provide space for potential reuse)
- o INEL Facilities - complete D&D of Chemical Process Plant Waste Tank, Materials Test Reactor Cubicle, and removal of Initial Engine Test waste line. (reduce safety hazards)

- o Production Reactors at Hanford - continue a systematic decommissioning of the 100 Areas facilities to allow for cost effective management of the Hanford 100 Areas Decommissioning program. (remove significant amounts of contamination in the facilities and reduce outyear surveillance and maintenance costs)
- o 201-C Strontium Semiworks at Hanford - continue dismantlement of areas outside main process cells. (reduce potential major contamination of the areas and reduce outyear surveillance and maintenance costs)

	FY 1984 Appropriation	FY 1985 Request
Long-Term Waste Management Technology	\$ 64,604	\$ 90,400

The Long-Term Waste Management Technology program is directed toward the long-term management of DOE radioactive wastes including an integrated transport system. The program consists of developing technologies for each waste type and assessing the associated hazards, costs, and environmental impacts in order to select and implement long-term disposition alternatives. In FY 1985, the program will focus on immobilization of high-level waste (HLW) at Savannah River and on the preparation of transuranic (TRU) wastes from Idaho and other sites to meet criteria for acceptance at the Waste Isolation Pilot Plant.

Construction of the Defense Waste Processing Facility (DWPF) will continue in FY 1985 with "hot" operations scheduled for FY 1989. The DWPF will immobilize the Savannah River Plant HLW for storage, transportation to, and disposal in a repository. The TRU waste efforts will provide technology for the certification of TRU wastes, processes for their further treatment and TRU transportation systems to support WIPP operations. Immobilization of HLW and processing of TRU wastes will provide a high degree of isolation from the environment and minimize the need for future maintenance and surveillance.

a. High-level waste technology	\$36,129	\$53,300
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The objective of this program is the long-term disposition of high level waste at Savannah River, Hanford, and Idaho. The FY 1985 program continues to focus on Savannah River with efforts at Hanford directed at determining the optimum immobilization approach.

Savannah River - This program directly supports the disposition of Savannah River waste including design and construction of the Defense Waste Processing Facility. Engineering studies and process and equipment development will support cost-effective design for the DWPF. Standard test methods will be established and approved for characterizing waste forms and canisters in order to evaluate these properties against established repository criteria and standards.

Defense Waste Processing Facility - Technical support activities are required during design and construction of the DWPF to reduce project risk and minimize startup and operational problems. Critical equipment and systems will be tested to demonstrate that they will meet performance requirements. Actual plant equipment will be tested and "run-in" prior to installation in the DWPF to reduce startup problems. Documentation will be prepared to support startup and operating procedures. Also provided are DWPF plant liaison, design and construction checking, engineering trade-off studies and other necessary efforts that support startup and operation of the DWPF in FY 1989.

Hanford - Planning, process development and engineering evaluations will continue to support the disposition of Hanford waste. Development of in-place stabilization technology for Hanford waste will be highlighted in FY 1985. Processes are being demonstrated and evaluated to use old waste sites for the permanent disposal of the waste they contain under circumstances where removal is not warranted. The principal concerns are prevention of collapse, subsidence, intrusion of water, radionuclide uptake by deep-rooted plants, and excavation by burrowing animals. Process and engineering studies transferred from the Interim Waste Operations budget will be continued in evaluating and testing design approaches for immobilization of high-level waste at Hanford. Environmental documentation will be completed during FY 1985.

Idaho - Planning and evaluation for long-term programs will continue. Limited feasibility studies for Idaho high-level waste immobilization will be continued in FY 1985 consistent with the Defense Waste Management Plan which supports immobilization efforts at ID in 2008.

	FY 1984 <u>Appropriation</u>	FY 1985 <u>Request</u>
b. TRU waste technology	\$ 6,755	\$ 11,220

Technology for preparation of TRU waste for emplacement in WIPP will be continued including demonstration of waste transport vehicle (TRU PACT) performance; completing process engineering studies required to certify remote handled wastes and transfer the technology to the sites; installing and testing the drum counter at Richland; demonstrating certification of newly generated remote handled waste at ORNL; completing cost optimization studies to determine the most cost effective way of disposing of TRU waste at the WIPP; conducting transportation logistics studies, and transferring technology from the Stored Waste Examination Pilot Plant at INEL to other sites that need to certify stored waste. The continuation of these efforts will support the orderly implementation of the Defense Waste Management Plan and DOE Order 5820.1 which details TRU waste management requirements.

Vitrification of contaminated soil in place is under development at Hanford. A strong electric current is passed between electrodes buried in the ground. The soil is melted and cools to form a glass-like material. Field tests will be conducted in FY 1985 on contaminated soil to demonstrate the fixation of radionuclides in place.

The facilities required to support SWEPP (i.e., retrieval area, storage space for containers before and after examination; and an area for overpacking and/or painting containers) are also provided at Idaho.

c. TRU waste processing facilities	\$ 8,430	\$ 13,780
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The objectives of the Processing Experimental Pilot Plant (PREPP) and the Stored Waste Examination Pilot Plant (SWEPP) are to develop processes, through experimentation, which can cost effectively treat the INEL stored TRU waste to meet the WIPP acceptance criteria. The SWEPP will initiate experiments in FY 85 to evaluate non-destructive examination and assay techniques to certify stored containers of TRU waste that meet the WIPP Acceptance Criteria without treatment in the PREPP. The PREPP experiments will examine processes to treat the uncertifiable TRU waste from the SWEPP to meet the Acceptance Criteria. The initial PREPP experiments will focus on shredding, incinerating (rotary kiln), and cementing. The increase for FY 1985 provides for peak construction necessary to support the PREPP completion in FY 1986.

d. Low-level waste technology	\$ 6,000	\$ 5,000
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In support of DOE waste operations for the disposal of low-level solid wastes (LLW) the objectives of this generic technology program are to: (1) improve techniques for disposal by shallow land burial (SLB) including methods for accurate prediction through adequate monitoring and modeling; (2) provide supporting documentation in assuring compliance with DOE criteria for disposal by SLB; (3) develop cost effective treatment processes to stabilize certain LLW streams and reduce volumes by generation avoidance; and (4) evaluate disposal concepts such as greater confinement for application at DOE sites.

The LLW program to improve SLB technology was begun in FY 1977 and now includes waste treatment, corrective measures, and alternative or greater confinement disposal techniques. In FY 1983, a low-level waste classification system which provides a hazard index based on hazard to man was developed to facilitate treatment, handling, and disposal. In FY 1984 handbooks will be made available to document technology for improved SLB, corrective measures, and waste treatment processes, and supporting documentation to provide suggested technical guidelines will be available for additional reference. In FY 1985 funding will provide for further field testing

for SLB improvements, testing to research waste source transport mechanisms, limited development for corrective measures and treatment processes, studies on the adequacy of greater confinement for higher hazard LLW, and tasks to avoid waste generation.

	FY 1984 Appropriation	FY 1985 Request
e. Airborne waste technology	\$ 835	\$ 0

The objective of this program was to develop technology for the containment and immobilization of gaseous effluents at DOE facilities. Efforts included: (1) particulate filtration development to increase service life of filters used in DOE facilities by using improved materials and pre-filter concepts; and (2) off-gas monitoring technology to assure efficient removal of radionuclides from effluents. In FY 1984 the program will complete the primary technology tasks and provide documentation of technology developed to assure adequate control of airborne wastes for DOE facilities for the closeout of the program.

f. Transportation research and development	\$ 6,455	\$ 7,100
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The nuclear materials transportation program is responsible for the planning, design, development, and testing of integrated transport systems to meet Department-wide nuclear material transport requirements. Transport system, packaging, and materials development and testing is conducted to ensure that safe, efficient, and cost effective transportation is available to support DOE operational needs. The program also provides transportation input to facility designs and environmental and safety analysis for DOE nuclear programs and Department of Transportation (DOT) and Nuclear Regulatory Commission (NRC) transport regulation development.

In FY 1985, work will focus on research, development, and evaluation of nuclear materials transport systems to meet the Department's program requirements. This will include structural and thermal analysis and modeling, test environment characterization, testing facility development, transportation logistics and economic analysis on specific programs under development, analysis of state and local government transportation packaging legislation, analysis of IAEA Safety Series 6 impact on U.S. packaging, and accident assessment and risk analysis under various routing scenarios. The major effort in FY 1985 will center on supporting the development of high-level and remote handled TRU transportation systems. In addition, certain engineering development technologies will be examined including tie-down technology, shock and vibration loads on packagings, seal and containment technology, remote handling technologies, development of standards (including the ASME Code for construction and in-service requirements for containment systems), and crack and failure analysis when examined by finite element codes. Work will also be conducted to improve risk assessment methods in connection with regulatory investigations. Operation of the transportation information services will continue as well as the maintenance of data bases on shipments, incidents, packaging, routing, and state and local legislation. Integration of these data bases to achieve user-friendly access from a single terminal will be implemented. The work will be carried out by industry, universities, and other Department of Energy organizations in addition to Sandia National Laboratory.

<u>Byproduct and Beneficial Use</u>	<u>\$10,000</u>	<u>\$ 0</u>
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The objective of the byproduct and beneficial use program is to identify and develop safe, beneficial, and cost-effective applications of radioisotopes and materials from the Defense fuel cycle. Also included are other efforts to support the Department of Defense (DOD) priority needs. Most DOE funded projects will be completed or terminated with funding from prior years. Specifically, the prior year funds for completion of the City of Albuquerque irradiator project will be made available to the City of Albuquerque. DOE commitments to provide continuing assistance to the City of Albuquerque will be reassessed. The operation of a transportable irradiator will be turned over to users, i.e., the U. S. Department of Agriculture, or terminated. Research using the Sandia irradiator and studies involving New Mexico State University

will be completed and final reports issued. Opportunities for strategic noble metal recovery will be considered as part of the Interim Waste Operations program and the DWPF project. The shipping cask developed to economically transport cesium and strontium capsules from storage at Hanford will be available for lease. Pork and fruit pilot plant irradiators will be completed with prior year funds and turned over to users for pilot operation. With regard to prototype power generators using the defense waste byproduct, strontium-90, the program is initiating fabrication of a high power radioisotope thermoelectric generator (RTG) and studying the feasibility of a radioisotope thermomechanical generator (RTMG) in FY 1984. In FY 1985, the RTG will be completed and turned over to DOD for demonstration in a mission essential application. Also, in FY 1985, previous developmental work in radioluminescent (RL) lighting will be brought to conclusion, and future efforts turned over to the DOD.

	FY 1984 Appropriation	FY 1985 Request
Terminal Storage.....	\$ 27,800	\$25,800

The Waste Isolation Pilot Plant (WIPP), located in Eddy County about 25 miles east of Carlsbad, New Mexico, will provide a research and development facility for demonstrating the safe disposal of defense transuranic (TRU) waste and for conducting R&D on various types of defense high-level waste (HLW) in a stable geologic environment. The TRU waste will remain retrievable for up to five years, after which time a determination will be made whether it will be allowed to remain in the WIPP in perpetuity. The high-level waste used for experiments will be retrieved and removed from the site prior to decommissioning of the WIPP facility.

A Final Environmental Impact Statement (FEIS) was issued in October 1980 and on January 22, 1981, DOE issued its Record of Decision. This decision was to proceed with WIPP as authorized in P.L. 96-164 "... as a defense activity of the DOE for the express purpose of providing a research and development facility to demonstrate the safe disposal of radioactive wastes resulting from the defense activities and programs of the United States."

Construction of permanent surface and underground facilities is proceeding on a phased basis, consistent with the evaluation of data obtained during the now completed exploratory program which was defined in the FEIS. If significant new environmental data results from physical construction, the geotechnical experimental program, or other WIPP project activities, the FEIS will be supplemented as appropriate to reflect this data. The decision to proceed with continued construction and operation of the WIPP facility will then be reexamined in the light of that supplemental National Environmental Policy Act (NEPA) review.

Operating expense funding provides for the continuation of experiments initiated in FY 1983 and FY 1984 and expansion of these efforts as the underground chambers are excavated. Specific work includes heater tests, simulated waste experiments, brine migration studies, and salt creep experiments. This work will be done by Sandia Laboratories. Sandia will also provide general geotechnical support of the WIPP project. Independent environmental, health and safety reviews will be conducted by the State of New Mexico Environmental Evaluation Group (EEG). This group, funded by DOE, provides independent peer review of all WIPP planning, design, and operations planning to ensure the health and safety of the citizens of New Mexico. In addition, minor support on geological issues is provided by the U.S. Geological Survey (USGS).

Funding will also provide for facility operations transition. This component includes those activities necessary for the development of an operating facility, such as turnover procedures and maintenance documents. A gradual ramp-up of operating personnel and training is planned through the construction period so that facility operations can begin upon construction completion.

Program Direction.....	\$ 2,470	\$ 2,100
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Program direction funds provide for the salaries, benefits, training, and travel expenses for 41 full-time equivalent (FTE) personnel associated with managing the Defense Waste and Byproducts Management program at DOE Headquarters. These employees are responsible for the administrative and technical support for program activities such as providing direction and control to the multiple DOE field installations involved in

the program, interacting with other federal agencies, state and local government, and budget formulation and execution including Congressional authorization and appropriation hearings. The technical direction and administration of the broad and complex array of defense waste and byproducts management activities with a small Headquarters staff requires maximum utilization of available personnel. The technical management staff devotes primary attention to major program activities, such as: (1) the operation of radioactive waste management systems at seven major DOE nuclear installations; (2) research and development for the long-term management of radioactive wastes at four major installations; (3) support of major projects including the Defense Waste Processing Facility at Savannah River, South Carolina, and the Waste Isolation Pilot Plant project near Carlsbad, New Mexico; and (4) Department-wide transportation operations and traffic management.

The reduction from FY 1984 will be accomplished by applying carryover prior year funds to FY 85 expenses. The underrun resulted from delays in replacing personnel and by filling positions at lower grade levels.

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Request</u>
<u>Capital Equipment</u>	\$ 34,500	\$35,771

Equipment funding is distributed by major program area as shown below:

	<u>FY 1984</u>	<u>FY 1985</u>
Interim Waste Operations	\$29,294	\$29,953
Long Term Waste Management Technology	4,006	5,218
Terminal Storage	600	600
Byproducts and Beneficial Use	600	0
	<u>\$34,500</u>	<u>\$35,771</u>

Most of the funding provides essential equipment to support defense waste and byproducts management interim waste operation efforts at Idaho, Oak Ridge, Albuquerque, Hanford, Nevada, Fernald, and Savannah River and to support landlord responsibilities at Idaho and Hanford. Equipment is also required to support long-term technology programs, including items necessary for waste experiments in the Waste Isolation Pilot Plant project.

Some of the 20-30 year old equipment at the Interim Waste Operations sites is severely deteriorated and obsolete. Failures are frequent and maintenance costs in conjunction with the attendant radiation exposure to maintenance personnel are not acceptable. In many instances, parts are no longer available and equipment replacement is more cost-effective than repair. The requested funding for capital equipment will provide replacement items that are important to the safety and reliability of continued operations.

Part of the capital equipment requirement is for surveillance of HLW tanks and for operational and maintenance activities associated with waste transfer, waste concentration, solidification, encapsulation, and management of liquid waste streams at Hanford, Oak Ridge, and Savannah River. Similar requirements exist at Idaho to support the operation of the waste calcining facility and at Oak Ridge to support the operation of the hydrofracture facility. The interim waste operations program also provides the equipment for solid radioactive waste storage and disposal at DOE sites. This includes the receipt, handling, and disposal of solid low-level radioactive waste, and the segregation and retrievable storage of transuranic- contaminated solid waste. Typical examples of the equipment used include: manipulators, pumps, motors, agitators, in-cell hoists, filters, leak detection equipment, handling devices, earth-moving equipment, soil moisture probes, waste evaporator parts, valves, laboratory apparatus, equipment for process development and testing, radiation monitoring instruments for surveillance and maintenance, and compactors and other volume reduction instruments.

The interim waste operations program is also responsible for providing site landlord support and transportation equipment at the Hanford Reservation and at INEL. Examples of equipment necessary to support this activity are data processing equipment for centralized computer center operations; light and heavy automotive equipment; heavy equipment such as cranes, bulldozers, scrapers, graders, and trailers; safety,

laboratory, and communications equipment; and general purpose office equipment. The increase primarily provides increases necessary for continuation of the equipment upgrade program to restore the safety and reliability of badly deteriorated general support facilities and equipment in the Hanford and Idaho landlord programs.

Equipment is also required within the Interim Waste Operations program to support decontamination and decommissioning projects. This equipment is usually large items with a life span of several years and replaces equipment where rental or lease costs exceed the equipment purchase price. Although some equipment may become contaminated during use in decommissioning operations, it will be reused on future decommissioning projects at DOE sites thereby reducing outyear costs. The following types of equipment will be procured: metal segmenting station, vacuum blast system, pneumatic scrambler, replacement motors, pumps and electrical equipment, decontamination and demolition equipment, radiation monitors, and excavating equipment and backhoes.

Long-term waste management technology major equipment requirements include: pump testing and melter feed preparation tanks and process instruments and controls, assay instrumentation, backup electric power generator for critical equipment testing and volume reduction process equipment. Smaller items are also required such as storage vessels, reaction heaters, gas flow controllers, particle generating system for filter testing, data recording system, scrubber liquid evaporation system, pulse height analyzer, and data transmission facilities for centralized computer process equipment control. In addition, testing equipment is required to evaluate the TRU transport system and instrumentation is required to develop accurate assay certification data for special case TRU wastes, particularly remote handled waste. Laboratory scale equipment is needed for the development and leach testing of waste forms for low-level waste streams. Instrumentation is also needed to support field testing of improved shallow land burial and greater confinement methods.

CONSTRUCTION PROJECTS OVERVIEW

<u>Project Number</u>	<u>Project Title</u>	<u>TEC</u>	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
85-D-156	General plant projects, interim waste operations and long-term waste management technology, various locations	\$ N/A	\$ 22,830 ^{a/}	\$ 25,645
85-D-157	7th Calcined Solids Storage Facility, INEL, ID	24,000	0	7,000
85-D-158	Central Warehouse Upgrade, Richland, WA	13,000	0	700
85-D-159	New Waste Transfer Facilities H-Area, Savannah River, SC	45,000	0	11,000
85-D-160	TRA Security Improvements, INEL, ID	7,000	0	2,000
84-D-200	Byproducts and Beneficial Use Albuquerque, NM	5,000	5,000	0
83-D-157	Additional radioactive waste storage facilities, Richland, WA	53,155	31,000	3,155
82-N-103	Waste handling and isolation facilities, Richland, WA	34,450	3,570	9,700
82-N-107	Rail replacement/Hanford railroad, Richland, WA	12,000	3,000	0

^{a/} FY 1984 GPP (84-D-150) shown for comparability purposes.

<u>Project Number</u>	<u>Project Title</u>	<u>TEC</u>	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
81-T-104	Radioactive waste facilities improvements, ORNL, TN	21,000	4,000	0
81-T-105	Defense waste processing facility, Savannah River, SC	870,000	142,000	238,000
77-13-f	Waste isolation pilot plant, Delaware Basin, Southeast, NM	459,000	<u>109,300</u>	<u>61,100</u>
Total Construction			\$ 320,700	\$358,300

<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
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85-D-156	General plant projects, interim waste operations and long-term waste management technology, various locations	\$ 22,830	\$ 25,645
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The funding is for various projects including construction, additions, upgrading, and replacement items that are required because of deterioration or obsolescence or increased waste storage or disposal requirements at the Albuquerque, Hanford, Idaho, Oak Ridge, Fernald, and Savannah River sites. They are necessary to meet critical health, safety, and environmental needs in landlord support and in waste management operational activities. Also included is funding for emergency repairs to sustain normal operations. In addition, general support for the long-term waste management technology program will be provided.

85-D-157	Seventh Calcined Solids Storage Facility, INEL, Idaho Falls, Idaho	\$ 0	\$ 7,000
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This project provides for the design and construction of a storage facility for 55,000 ft³ of granular solid (calcine) produced by the New Waste Calcining Facility (NWCF), located at the Idaho Chemical Processing Plant. The NWCF processes the liquid high-level waste generated from reprocessing primarily spent naval reactor fuels into a form suitable for extended storage.

85-D-158	Central Warehouse, Richland, Washington ...	\$ 0	\$ 700
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This project replaces the current dilapidated warehouse built during World War II with a new facility which will provide 133,000 sq. ft. of warehouse space and 22,000 sq. ft. of office space. In addition, a separate building of 5,000 sq. ft. will be built for storage of flammable materials and liquids.

85-D-159	New Waste Transfer Facilities, H-Area, Savannah River, South Carolina	\$ 0	\$ 11,000
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This project will replace the existing deteriorated H-Area Diversion Box #2 transfer facility with one of current design. This facility, which is designed to transfer waste between the east and west H-Area tank farms, and between F and H Areas, will have the capability to expand to meet future needs, including accommodating DWPF feed and recycle streams.

85-D-160	Test Reactor Area (TRA) Security Improvements, INEL, Idaho Falls, Idaho	\$ 0	\$ 2,000
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This project will enhance the intrusion and sabotage prevention at the Test Reactor Area (TRA) located at the Idaho National Engineering Laboratory (INEL) and will increase the physical protection of the Advanced Test Reactor (ATR) plant components and Special Nuclear Materials (SNM) housed within the TRA. State-of-the-art detection and intrusion control systems will be utilized, and equipment and methodology resulting from ongoing DOE research programs will be incorporated into the design of four subprojects whose completion will accomplish the goals set forth in the TRA Security Plan.

83-D-157 Additional radioactive waste storage facilities, Richland, Washington	\$ 31,000	\$ 3,155
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This project provides eight double shell tanks and support facilities for the storage of liquid waste removed from old tanks, waste from nuclear operations, and waste from PUREX processing of fuel from extended N-Reactor operations.

82-N-103 Waste handling and isolation facilities, Richland, Washington	\$ 3,570	\$ 9,700
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This project provides capital funds for the isolation of old single shell tanks and related structures (e.g., sealing of tank openings); surveillance instrumentation for monitoring waste storage tanks; upgrading of the cathodic protection system to protect buried piping against corrosion; improvements in the centralized Computerized Automatic Surveillance System for the waste tanks; and construction of a Portable Grout Facility to process low-level liquid waste streams for disposal. These streams are currently routed to double shell tanks for storage.

81-T-105 Defense Waste Processing Facility (DWPF), Savannah River, South Carolina	\$142,000	\$238,000
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This project will provide facilities for solidifying the high-level radioactive waste at the Savannah River Plant (SRP) for temporary storage on site, and for transportation to, and disposal in a federal repository. These facilities will immobilize the high-level waste in borosilicate glass in steel canisters. The canisters will be stored on the SRP site in air-cooled vaults until a federal repository is available. The facility will also provide for the solidification of the decontaminated portion of the liquid and salt for disposal on site as a low-level radioactive waste. Opportunities to recover useful byproducts will be considered and implemented where practical. The DWPF will begin operation in FY 1989 and will process the backlog waste inventory over approximately 15 years.

The DWPF provides the final step in processing the high-level waste by converting it to an immobilized solid for disposal. Approximately 30 million gallons of high-level waste in the form of liquid, salt, and sludge have accumulated at SRP from production operations and an additional five to ten million gallons will be generated through the year 2000. Final processing of this waste for disposal had been deferred for almost 30 years. Immobilization of the high-level waste for eventual confinement in a repository will insure the long-term isolation of the waste from the environment with minimal maintenance and surveillance.

The process for immobilizing the high-level waste in borosilicate glass has been demonstrated and is ready for large-scale application. The sludge portion of the HLW will be treated in the tank farm, transferred to the DWPF, and solidified in borosilicate glass. The liquid and salt portion of the waste will be decontaminated to remove primarily cesium which can then be solidified in the DWPF, either with the sludge or as a "cesium only" glass for possible beneficial use, or it can be separated for later solidification into another form. The decontaminated liquid and salt will be combined with concrete and SRP soil to produce a low permeability monolith for disposal on site as low-level waste.

The DWPF will demonstrate the ability to handle high-level waste by properly preparing it for disposal rather than just continuing to store the increasing inventories in tanks that require periodic replacement. After many years of effort a consensus has been reached on the proper role, scope and pace of the DWPF project. This consensus was reflected in the President's FY 1984 budget submission to the Congress. The DWPF is consistent with the Nuclear Waste Policy Act of 1982, a high priority program within the Administration. The importance of this project was recognized by the President's Private Sector Survey on Cost Control which recommended that the DWPF move forward at the fastest practical pace.

The DWPF will provide immobilized defense high-level waste for retrievable experiments in the WIPP in 1990. No other source of immobilized defense high-level waste will be available then.

The project was authorized for design in FY 1981 and FY 1982. The FY 1983 funding continued the design efforts to approximately 37% complete. The FY 1984 funding of \$142 million provides for design to approximately 65% complete, the start of major construction work, and award of major subcontracts for the excavation, glass melter, process cell cranes, main process building construction, instrumentation, electrical distribution system, construction support facilities and construction materials such as piping, pipe hangers, rebar, etc. The FY 1985 request of \$238 million is necessary to maintain the project schedule for completion by June 1989, and the total estimated cost (TEC) of \$870 million.

In FY 1985 final design will continue to approximately 80% complete. Construction of the main process buildings and support facilities will continue and additional major procurements will be made for essential construction materials and equipment. Site preparation work on primary water facilities such as storm and sanitary sewers, wastewater treatment, and water wells will be completed during this fiscal year. Construction will continue in FY 1985 on the main process building for DWPF and initiated on the service building, sand filter, fan house, and interarea pipeline and transfer facilities. Major procurements include process cell cranes, radiation monitoring equipment, process equipment and monitoring systems, canisters handling equipment, heating and ventilation systems, and electrical equipment.

	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Request</u>
77-13-f Waste Isolation Pilot Plant (WIPP), Delaware Basin, Southeast, New Mexico....	\$109,300	\$61,100

The successful completion of the exploratory phase of WIPP in July 1983 has allowed construction of permanent surface and underground facilities to start in late FY 1983. During FY 1985, construction will continue at near the peak effort reached in FY 1984. The reduction in funding from FY 1984 does not reflect a decrease in the pace of construction. All work is accomplished through fixed-price contracting of discrete work packages. Much ongoing FY 1985 construction will have been funded through fixed-price contracts awarded in FY 1984.

During FY 1985 the main thrust of construction will be the primary waste handling and support building which is the project critical path. Other work will include continued construction of the facility control system, yard piping, yard electrical systems, and the storage exhaust filter building (HEPA filter system). The railroad spur which includes about 6 miles of track connecting to a nearby potash mine railhead will be completed. Also scheduled for completion are the 31-mile water pipeline, site access roads, and the 14-foot diameter exhaust shaft.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

1. Title and location of project: General plant projects, interim waste operations and long-term waste management technology, various locations	2. Project No. 85-D-156
3. Date A-E work initiated: 1st Qtr. FY 1985	5. Previous cost estimate: None
Date: N/A
3a. Date physical construction starts: 1st Qtr. FY 1985	6. Current cost estimate: \$25,645
Date: 6/83
4. Date construction ends: 4th Qtr. FY 1987	
7. <u>Financial schedule (Prior year projects shown for comparative purposes):</u>	

Fiscal Year	Obligations	COSTS			
		FY 83	FY 84	FY 85	After FY 85
Prior Years	\$ 0	\$ 5,396	\$ 2,415	\$4,939	\$ 0
FY 1983	19,645	3,041	7,859	8,745	0
FY 1984	22,830	0	9,247	5,688	7,895
FY 1985	25,645	0	0	7,652	17,993

8. Brief physical description of project:

These projects provide various items of new construction, additions, alterations, and improvements to the land, buildings and utility systems at the Albuquerque, Richland, Idaho, Oak Ridge, and Savannah River Offices to support waste management program needs in health, safety, environment, general support, and other program requirements.

These projects also provide for various items of new construction, additions, and alterations to the land, buildings, and utility systems at Savannah River in support of the Long-Term Waste Management Technology program. This includes the cost of installation which is an integral part of general plant projects.

CONSTRUCTION PROJECT DATA SHEETS

<p>1. Title and Location of Project: General plant projects, interim waste operations, and long-term waste management technology, various locations</p>	<p>2. Project No. 85-D-156</p>
<p>9. Purpose, justification of need for, and scope of project:</p>	

The estimate is based on the requirements of the various operating offices cited below:

<u>Interim Waste Operations</u>	
Albuquerque - Los Alamos National Laboratory	\$ 300
Richland	5,871
Idaho	3,815
Oak Ridge National Laboratory	2,500
Savannah River	1,474
Richland - Landlord	3,750
Idaho - Landlord	6,365
Feed Material Production Center	980
Subtotal Interim Waste Operations	\$25,055
<u>Long-Term Waste Management Technology</u>	
Savannah River	500
Idaho	90
Total Defense Waste	\$25,645

Examples of subprojects under consideration are given below with preliminary cost estimates. A continuing study of requirements may result in changes, additions, or postponements.

Albuquerque - Los Alamos National Laboratory - Interim Waste Operations \$ 300

Size Reduction Facility Airlock Entrance - \$300

The Size Reduction Facility (SRF), constructed in 1979-80, is a production-oriented, prototype facility intended to reduce in volume and properly package TRU waste such as gloveboxes, duct work, and process equipment. Test operations have demonstrated a need for additional work space for certain functions. Specifically, space outside the SRF glovebox enclosure is very limited, thus restricting severely the ability to unpackage (from storage crates) large waste items in a proper containment area. The building addition described will serve both as an airlock entrance and unpackaging area for such items. A separate ventilation system in the new airlock will limit possible spread of contamination, if released in such operations, thus protecting the much larger building area in the existing facility. In addition, a special decontamination chemical fume hood will allow for rapid and more efficient cleaning of small equipment items routinely contaminated in SRF operations. Finally, use of the new WIPP approved metal crates requires a properly contained and ventilated area where the weld closure and subsequent leak testing can be accomplished. The majority of such waste packages at the Laboratory will be generated as a result of SRF operations, and the SRF airlock will provide the appropriate facility for this essential operation.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: General plant projects, interim waste operations, and long-term waste management technology, various locations	2. Project No. 85-D-156
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9. Purpose, Justification of Need for, and Scope of Project: (cont'd)

Richland - Hanford Site - Interim Waste Operations \$ 5,871

Capital Work Orders \$ 571

These are miscellaneous jobs of a capital nature, which are necessary to maintain continuity of operation, protection of the environment, and to provide safeguards for the protection of life and property. Such jobs would include additions, improvements, replacements of structures, building services, utilities, and associated equipment.

216-A-10 Crib Replacement \$ 500

This project will replace the 216-A-10 crib which receives process condensate from PUREX. The anticipated life of the existing crib is 3 to 6 years, depending upon PUREX operations. The replacement crib must be ready to avoid possible impacts on PUREX operations.

222-S Low-Level Liquid Effluent System Upgrade \$1,000

This project will replace the low-level liquid drain system (in the 222-S Facility) feeding the 207-SL Retention Basin. The current system is rapidly deteriorating due to age and usage. Since the drain traps are located overhead in service tunnels, leakage is a problem for both personnel and facilities/equipment.

Electrical Distribution System Upgrade, 222-S \$ 800

This project provides for the upgrade of the main electrical distribution switch gear and low voltage distribution panels throughout the 222-S facility. Electrical wiring within the facility will also be upgraded to meet current electrical codes.

AN/AW Farm Exhaust Filter Change Building \$ 300

This project will provide a facility in AN and AW tank farms for exhaust filter changes. This facility will permit filter change outs when needed regardless of the weather conditions. Currently filter change outs are dependent on the weather.

Reroute Tank Farm Receiver Drain Lines \$ 400

This project provides for the rerouting of drain lines from 102 AN to 104 AN. Rerouting the drain lines will reduce the mixing of wastes, ultimately saving operating dollars.

Upgrade Cross Site Transfer Facilities - 200 West \$ 300

This project provides piping changes to permit the use of the existing double shell receiver tanks for lag storage prior to cross site transfers. Future evaporator operations will make the existing vessel unavailable for this use.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: General plant projects, interim waste operations, and long-term waste management technology, various locations	2. Project No. 85-D-156
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9. Purpose, Justification of Need for, and Scope of Project: (cont'd)

Master Pump Shutdown System Upgrade \$ 500

This project will provide hardware, software, and display equipment in 242-A Evaporator building to upgrade the master pump shutdown system to avoid unrelated events from delaying operations. Operating efficiency of the evaporator and tank farms will be improved.

Upgrade 219-S Draining System \$1,000

This project provides for the replacement of the high-level radiation waste drain lines from S Plant to the 219-S storage tanks. Integrity of current drain lines is poor due to prolonged usage and corrosive nature of liquid waste materials.

Air Supply Line Replacement to Air Lift Circulators \$ 500

This project will provide piping and controls to upgrade the air supply lines to air lift circulators in the boiling waste tanks. The integrity of existing supply lines is questionable because they are past their design life and have already had some leakage problems. The air lift circulators are required to prevent solids from settling in the tanks.

57
50
20
Idaho National Engineering Laboratory - Interim Waste Operations \$ 3,815

RWMC Intermediate-Level Transuranic Storage Facility (ILTSF) Vault Procurement and Installation \$ 615

This project will expand the ILTSF vault capabilities. The requested vaults will fulfill the 1985 requirements forecasted by waste generators both onsite and offsite.

Vault storage capacity will be exhausted unless additional vaults are installed. DOE-ID is responsible for providing for vault storage of transuranic waste generated by DOE facilities and no viable alternative exists.

A typical storage vault consists of a carbon steel cylinder buried in an earth berm and supported by a sand-cement grouting such that its longitudinal axis is vertical and its upper end extends approximately 4 inches above the pad surface. Each vault is provided with shielded plugs and environmental surveillance equipment.

West Side Service Waste Transfer System \$ 400

West side service waste is currently being disposed of directly to the ICPP injection well from CPP-734 (West Side Process Waste Monitoring Station) and from CPP-603 (Fuel Storage Facility). The recent temporary shutdown of the injection well severely restricted experimentation activities in CPP-620 and CPP-637 (High and Low Bay Laboratories). Development work on waste calcination and Fluorinel dissolution flow sheets was delayed for 2 months. The uncertainty associated in operating with a single means of service waste disposal is unacceptable. A route for the disposal of the west side service waste stream through the East Side Service Waste System is required to provide flexibility in ICPP operations.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: General plant projects, interim waste operations, and long-term waste management technology, various locations	2. Project No. 85-D-156
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9. Purpose, Justification of Need for, and Scope of Project: (cont'd)

The west side service waste is monitored in CPP-734, but there is no automatic diversion system should contamination be detected. The service waste from CPP-603 is not monitored. This service waste should be routed through the East Side Service Waste System, which has automatic detection and diversion capabilities.

This project will provide the necessary systems for tying in the West Side Service Waste System and CPP-603 service waste stream into the East Side Service Waste System upstream of the diversion monitors. Included will be a new service waste sump tank, pumping systems and other piping, valves, and tie-ins necessary to effect the project.

Process Solids Storage Facility \$ 950

ICPP has been designated as the location for interim storage of the Fluorinel Dissolution Process and Fuel Receiving Facility (FAST) process solids. The process solids are undissolved wastes from fuel processing. These wastes contain transuranics and have high radiation levels. Retrievable storage must be provided to allow for later shipment to a permanent federal repository. The storage facilities must provide for security and surveillance requirements. This project will construct dry underground storage vaults for process solids which will be lined with stainless steel. A lifting fixture will be provided for retrieving the storage canisters. Geometrical controls will be used to ensure criticality safety. Vault shielding will be provided to minimize radiation exposure. Facility access will be restricted and TV surveillance maintained for security.

WC-114 Evaporator Replacement \$ 900

Discharge of ICPP service waste to either the injection well or the percolation pond currently must meet the Environmental Protection Agency-UIC limits (DOE uncontrolled area guidelines). Meeting these limits will require pretreatment of most of the decontaminating solutions and some of the normal process waste prior to their being processed through the process equipment waste (PEW) evaporators. In the past the nuclide content of these solutions has been too high to get an adequate decontamination factor across the PEW evaporators. Examples of this waste are those generated during decontamination following the electrolytic and zirconium dissolution campaigns (wastes containing ruthenium have created significant problems in the past). The most effective pretreatment method is another stage of evaporation with the concentrate (bottoms) going to the tank farm for calcination and the condensate (overheads) going to the PEW evaporators for further evaporation cycles. Vessel WC-114 in the old Waste Calcining Facility has been used for this purpose in the past; however, its age and deteriorated condition make its reliability unacceptable for long-term use. This project will provide a replacement evaporator to assure reliable operations and a means for transferring waste from the CPP-601 deep tanks to the replacement evaporator.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: General plant projects, interim waste operations, and long-term waste management technology, various locations	2. Project No. 85-D-156
9. Purpose, Justification of Need for, and Scope of Project: (cont'd)	

Ion Exchange Resin and Sludge Disposal System \$ 950

The Fuel Storage Facility (CPP-603) and the fuel storage basin in the Fluorinel Dissolution Process and Fuel Receiving (FAST, CPP-666) do not have systems for handling and disposing of spent resin from ion exchange units and sludge generated from other operations in the fuel storage areas.

The spent resin and sludge from CPP-603 are currently stored in an underground storage tank adjacent to CPP-603. It is estimated that the vessel will be filled about 1986. Since it is planned to continue to use CPP-603 for fuel storage until at least 1992, either a new storage tank or a method for disposal of resin and sludge in the existing tank is needed.

This project will provide a cost-effective system for packaging radioactive resin and sludge wastes to be shipped and stored at the RWMC. Design of the system will be coordinated between FAST and CPP-603 facility designs. Consideration will be given to a mobile system for dewatering and packaging the resin and sludge. Modifications at CPP-603 and FAST would be required to be compatible with the mobile system.

Oak Ridge National Laboratory - Interim Waste Operations \$ 2,500

Initial Decontamination Facility \$ 600

The purpose of this facility modification and additional equipment will be to reduce the inventory of contaminated waste material at ORNL and to reduce the consumption of Solid Waste Disposal Area capacity by decontaminating radioactive material and equipment so that it can be returned to service or disposed of in nonradioactive disposal areas.

The facility modification and the additional equipment will provide capability to decontaminate equipment and material from 200 mR, beta gamma, to a level that will permit handling as nonradioactive materials.

Solid Waste Disposal Area #7, Initial Development \$ 900

Based on current and projected generation rates of solid, low-level radioactive waste, the present solid waste disposal area (SWDA #6) has a projected capacity which will only extend another 6 to 10 years. Based on the lead time required to select, characterize, design and develop low-level waste shallow land burial facilities, an FY 1985 general plant project is required to provide an available operating facility when the present area becomes full.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: General plant projects, interim waste operations, and long-term waste management technology, various locations 2. Project No. 85-D-156

9. Purpose, Justification of Need for, and Scope of Project: (cont'd)

ILW Line Replacement, Isotope Area \$ 500

This portion of the ILW system has only single containment and is, therefore, not in compliance with the requirements of ORNL Procedures and Practices for Radiation Protection (Health Physics Manual), Procedure 1.3 "Radiation Protection in the Design of Experiments and Plant Operations" dated April 30, 1980. Due to the advanced age of the present single contained ILW system components, an increasing potential for release of contaminants to the environment exists. Failure to make these and future improvements to the ILW system would risk continued increasing potential for the release of contamination which could adversely impact both onsite health and safety and the continued operation of hot cell operations in the Isotope Area facilities.

Hydrostatic Head Measuring Station, SWDA #3 \$ 500

These wells will be used to monitor the hydrostatic pressure in the strata underlying SWDA #3 as part of the groundwater monitoring program for ORNL SWDA's. Changes in hydrostatic pressure can give insight to predicting changes in depth of the water table, determining changes in formation porosity, and monitoring for radioactivity which may have migrated from buried radioactive waste through fractures in the underlying rock formations.

Savannah River Plant - Interim Waste Operations \$ 1,474

Minor Projects \$ 574

Minor projects, each costing \$75,000 or less, are needed to (1) maintain safety and continuity of operations and (2) add to existing programs in support of the Interim Waste Management Program.

Expansion of Change Room and Laundry Storage Facilities in 241-28F&H - Area Control Rooms .. \$ 200

The present change rooms and laundry storage facilities in 241-28F&H are inadequate due to the influx of new personnel connected with the waste removal program. Expansion of the existing change rooms and laundry storage areas will provide sufficient space to accommodate this increase in work force.

H-Area Change Facility \$ 200

Change facilities are used to don and remove protective clothing and for storage of clean and potentially contaminated clothing. The present facilities are housed in a temporary trailer providing an inadequate change area for employees and inadequate storage area for protective clothing and equipment. This project will provide H Area with a permanent change facility with sufficient changing and storage areas.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: General plant projects, interim waste operations, and long-term waste management technology, various locations	2. Project No. 85-D-156
9. Purpose, Justification of Need for, and Scope of Project: (cont'd)	

Burial Ground Monitor Building \$ 100

This project will replace the temporary trailer, now used for monitoring offsite and high-level shipments of burial waste, with a permanent structure. This building will be environmentally controlled to protect the sensitive monitoring equipment to be contained within.

Permanent Health Protection Buildings, F&H Areas \$ 400

In concurrence with SRP's plan of phasing out the use of all temporary trailers, the Health Protection trailers in F&H Areas will be replaced with permanent buildings providing the necessary facilities for proper operation.

Richland Landlord - Hanford Site - Interim Waste Operations \$ 3,750

Miscellaneous Capital Work Orders \$ 830

These are miscellaneous jobs of a capital nature, which are necessary to maintain continuity of operations, protection of the environment, and to provide safeguards for the protection of life and property. Such jobs would include additions, improvements, and replacements of structures, building services, utilities, and associated equipment.

Traffic Safety Improvements, 1100 Area \$ 550

This project will upgrade the 1100 Area traffic patterns to accommodate safe pedestrian and vehicular traffic. The 1100 Area is the site of Central Stores, bus rider parking and maintenance shops. The 1100 Area is bordered by Route 4 South, a major highway connecting the Hanford site with the main population centers. This section of highway contains numerous access points which are not compatible with highway driving. Also, numerous pedestrians cross the highway at this location without adequate protection.

600 Area Road Improvements Route 4 South \$ 500

This project will upgrade Route 4 from the gravel pit, north of the 300 Area towards the FFTF intersection. The upgrade would include shoulder and lane widening and overlay of the road surface.

200 East Office Building \$ 970

This project will provide an approximately 14,000 square foot office facility. The office facility is required to replace mobile office units and deficient facilities which are no longer safe or economical to occupy. The permanent structure will provide space for approximately 100 personnel.

500

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: General plant projects, interim waste operations, and long-term waste management technology, various locations	2. Project No. 85-D-156
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9. Purpose, Justification of Need for, and Scope of Project: (cont'd)

Steam Distribution Improvements, 200 Areas \$ 900

To increase 200 Area steam distribution efficiencies, this project will add insulation to existing steam lines. Insulation thickness and lines to be upgraded will be selected on the basis of most attractive paybacks.

Idaho National Engineering Laboratory - Landlord - Interim Waste Operations \$ 6,365

Radiation Measurements Facility \$ 900

This project will provide space for the consolidation of low-level radiation measurement work. Currently three locations are utilized to perform this service, TRA-604, CF-690 and ARA 1. ARA 1 is scheduled for decontamination and decommissioning as most of the nonradioactive measurement functions will be moved to the Idaho Lab Facility. The consolidation of this service into one facility would eliminate the use of substandard facilities (ARA 1) and improve the operational and functional efficiencies of the radiation measurements services.

INEL FY 1985 Road Program \$ 150

This project consists of the modification, upgrade or renovation of miscellaneous small and high priority paving projects at various INEL locations. This would include intersection changes, service road upgrades, minor parking lot expansions or other priority projects needed for safety, uninterrupted transport of radioactive waste, and for other priority projects needed for intersection changes, service road upgrades, minor parking lot expansions or other priority projects needed for operations traffic. Projects currently identified as candidates for inclusion in this project include parking lot expansions to maintain safe, clear access to facilities, service road paving for use by fuel delivery trucks, intersection modifications and turnouts for safety reasons and paving for access to new liquid waste filtering and cleanup sites.

Miscellaneous and Minor Projects \$ 240

This project is comprised of small subprojects that are lumped together under one GPP to respond to smaller emergency or high priority needs and for ease of administration of projects with lower costs. These projects are sometimes not identified until several weeks before they are constructed. Examples of such projects are drainage corrections, personnel survey station modifications, crane rail modifications for safety, head bolt heater rack upgrades, culvert replacements, etc.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: General plant projects, interim waste operations, and long-term waste management technology, various locations	2. Project No. 85-D-156
9. Purpose, Justification of Need for, and Scope of Project: (cont'd)	

CFA Warehouse Office Addition \$ 700

This project will provide 9000 square feet of efficient office space for approximately 45 warehouse, receiving, and accounting personnel. The current office space was originally designed as warehouse space and is energy inefficient and extremely overcrowded. The new addition will provide for efficient heating and cooling for office and computer terminal use. This design will incorporate systems and space for current and anticipated growth in computer terminal usage and technology.

CFA Warehouse Space Renovation \$ 200

This project will provide for renovation of warehouse designed facilities that are currently used for craft shops. These facilities will be renovated to return the space to its original design as warehouse space. The low electrical power requirements and unheated application of this space will provide an economical and functional utilization of these warehouse facilities.

CFA Filter System for Waste Water Drain Field \$ 75

The hot and cold laundry does not have a filter system to retain lint and strings from the washing operation. The lint is being carried to the septic tank and through to the drain field. This project will provide for a filter system to prevent lint and debris from entering the waste water drain field and plugging the system. If a filter system is not installed, percolation of waste water will be restricted, resulting in ponding of waste water and a new drain field will be necessary.

TRA Utility Electrical Upgrade \$ 250

This project will upgrade the old Motor Control Centers (MCCs). These units are difficult to maintain due to the unavailability of parts and there is no expansion capability remaining to handle new power loads. These utility MCCs are essential to the operation of TRA. This project will properly match existing and future anticipated electrical loads to a modern upgraded distribution system.

MTR Heating System Upgrade - Utility Area \$ 300

This project will complete the remaining problem area of heating at TRA. The main area of concern is the utility area. The present heating system is a 30-year-old steam and condensate system. Underground steam leaks, requiring significant excavation to repair, are occurring two to three times per year. Heating system efficiency has been reduced to approximately 60 percent, due, in part, to underground insulation deterioration. This project will utilize an alternate heating system that will be more efficient and less costly to operate.

500

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: General plant projects, interim waste operations, and long-term waste management technology, various locations	2. Project No. 85-D-156
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9. Purpose, Justification of Need for, and Scope of Project: (cont'd)

TRA Security UPS System \$ 200

This project will consist of an Uninterrupted Power Supply (UPS) for the security system associated with the TRA facilities. Multi-program groups and areas depend on this system for evacuation, monitoring, and communication. Currently security alarm systems are powered by commercial and AIR diesel power, which are subject to long outages. The existing power source for the security system does not have instantaneous switching capability as required by DOE Order 5632.1. This project would procure a 20 kW UPS with switchgear, batteries and other related electrical installation materials. The UPS will be located in TRA-620 (Guard House).

TRA Guardhouses..... \$1,000

This project provides four guardhouses for the expanded INEL security guard force. The guardhouses will be constructed at key traffic arteries on the INEL site to provide improved security guard monitoring and control of personnel and vehicle access, and to provide improved guard response to sabotage or theft at INEL's nuclear facilities.

TRA Hot Cell Iodine Adsorber Upgrade \$ 480

This project consists of design, fabrication, procurement and installation of two iodine adsorber units (containing silver zeolite, AgX) in the exhaust system of TRA Hot Cell #1 plus remote mechanical bypasses for all three hot cells to allow bypassing the iodine adsorbers. AgX is superior to the existing charcoal filters in adsorption efficiency, has a longer service life and does not require fire protection in the exhaust system. The bypass will allow placing the iodine adsorbers into service only as needed, thus prolonging the life of the AgX. The Hot Cell is used by site-wide programs and if this system is not installed, program interruption and continuing hazard to personnel at TRA by releases of radioactive iodine from the Hot Cells could result. Currently, post-irradiation fuel examination schedules must be delayed to limit the iodine hazard. The present charcoal adsorbers also constitute a fire hazard with increased potential of particulate release.

TRA Chemistry Laboratory Upgrade \$ 900

This project will upgrade the present multi-program chemistry laboratories (including benches, hoods, water systems, etc.) that are outdated and impractical for adequate chemistry operations. Support groups for the INEL currently use these facilities. Experimental work and laboratory test data are compromised by the poor conditions.

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CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: General plant projects, interim waste operations, and long-term waste management technology, various locations 2. Project No. 85-D-156

9. Purpose, Justification of Need for, and Scope of Project: (cont'd)

TRA Maintenance Facility Upgrade \$ 270

The TRA shop layout is congested such that operating machines interfere with one another. Storage of raw materials is less than adequate as identified by safety personnel. Efficiency is now hampered and material degradation is excessive. This project will also upgrade the energy efficiency of this facility.

TRA Power and Computer System Upgrade \$ 500

The majority of electrical power equipment at TRA is more than 30 years old. The equipment has little or no expansion capability and repair parts are practically impossible to obtain. This project will replace, consolidate, or refurbish motor control centers (MCCs) and power distribution panels. This project will also install a new 100 kVA Uninterruptible Power Supply (UPS) to operate the variety of computer systems in the MTR building complex.

TRA Radiation Area Monitoring (RAM) System \$ 200

The RAM system is old, obsolete, and requires replacement. This project will upgrade and replace the individual area monitors and locate them in appropriate locations with a common readout in the Advanced Test Reactor (ATR), ATR Reactor Data Acquisition System (RDAS), and the Materials Test Reactor (MTR) Health Physics rooms. This project will eliminate the potential for undesired personnel radiation exposure.

Feed Materials Production Center (FMPC) - Interim Waste Operations \$ 980

Additional Waste Management Facilities \$ 980

This project will provide a 139,000 cubic foot concrete silo to hold dried sludge from FMPC production operations. This waste used to be disposed of as a wet slurry directly into lined basins. In FY 1983, a transition was made from that practice to one in which the slurry was dried and the resultant solid stored in concrete silos. The FMPC will run out of space in the existing silos and have to return to direct disposal if this additional silo is not built.

Savannah River - Long-Term Technology \$ 500

Minor Projects, each \$75,000 or less \$ 200

A continuing need exists for capital modifications and improvements, each costing \$75 or less, to the Equipment Test Facility (ETF) at Savannah River to assure safe operation and to support the equipment development and testing for DWPF.

CONSTRUCTION PROJECT DATA SHEETS

<u>1. Title and Location of Project:</u> General plant projects, interim waste operations, and long-term waste management technology, various locations	<u>2. Project No.</u> 85-D-156
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9. Purpose, Justification of Need for, and Scope of Project: (cont'd)

DWPF Melter Testing \$ 300

Modifications and improvements are needed to Building 675 of the Equipment Test Facility (ETF) for the installation and testing of the DWPF glass melter. The melter will be tested and "run-in" at the ETF prior to installation in the DWPF canyon to avoid later startup and operational problems.

Idaho - Long-Term Technology \$ 90

RWMC TSA Pad #2 and #3 Paving Expansion \$ 90

This project will increase the paved turning area for large vehicles to enter SWEPP and Certification and Storage (C&S) buildings.

Paving will ease the maneuverability problem for large tractor/trailer vehicles, as well as remove areas of possible mud from melting snow and rainfall. Large vehicles have to turn tightly to get into and out of the SWEPP and C&S buildings. Unpaved areas are not easy to clear of snow and therefore the ice buildup and consequent mud problem is an operational safety hazard.

10. Details of cost estimate:

It is not possible to provide a detailed cost estimate for the projects. Cost estimates for general plant projects are normally included in the request for a construction directive after the need for the work has been established, the scope of the job determined, and the preliminary engineering completed.

11. Method of Performance:

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

12. Funding schedule of project funding and other related funding requirements:

Not applicable to projects with a total estimated cost of less than \$5 million each.

13. Narrative explanation of total project funding and other related funding requirements:

Not applicable to projects with a total estimated cost of less than \$5 million each.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

1. Title and location of project: Seventh Calcined Solids Storage Facility Idaho Chemical Processing Plant, Idaho National Engineering Laboratory, Idaho	2. Project No. 85-D-157
3. Date A-E work initiated: 2nd Quarter FY 1985	5. Previous cost estimate: None Date:
3a. Date physical construction starts: 2nd Quarter FY 1985	6. Current cost estimate: \$24,000 Less amount for PE&D 0 Net cost estimate \$24,000 Date: 3/83
4. Date construction ends: 3rd Quarter FY 1989	

7. Financial Schedule:

	FISCAL YEAR	AUTHORIZATION	APPROPRIATIONS	OBLIGATIONS	COSTS
C S S F	1985	\$ 7,000	\$ 7,000	\$ 7,000	\$ 3,300
	1986	17,000	17,000	17,000	6,200
	1987	0	0	0	6,900
	1988	0	0	0	5,500
	1989	0	0	0	2,100

8. Brief Physical Description of Project:

This project provides for the construction of the Seventh Calcined Solids Storage Facility (CSSF). The facility will have a total storage capacity of approximately 55,000 cubic feet. The facility will be of sufficient volume to accommodate radioactive liquid waste processing at the Idaho Chemical Processing Plant (ICPP) until approximately FY 1994. The liquid waste produced from the reprocessing of irradiated, highly enriched uranium fuel elements by dissolution and solvent extraction will be converted to a granular solid in the New Waste Calcining Facility (NWCF) and stored in the CSSF.

The Seventh CSSF and all associated utilities will be integrated with NWCF. The facility will consist of (1) facilities for primary and secondary containment of the calcined solids, (2) equipment rooms, (3) solids separation equipment, (4) instrumentation and controls, (5) solids transport lines and feed distribution system, (6) primary container vent system, (7) provisions for retrievability, (8) necessary safety features including shielding, (9) decay heat removal system, (10) High Efficiency Particulate Air (HEPA) filtration systems, and (11) air radiation monitoring systems.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Seventh Calcined Solids Storage Facility
Idaho Chemical Processing Plant,
Idaho National Engineering Laboratory, Idaho
2. Project No. 85-D-157
8. Brief Physical Description of Project: (cont'd.)

Stainless steel bins will provide the primary containment and the concrete vault the secondary containment for the calcined solids. The vault, which will be largely below ground, will also provide the necessary radiation shielding. It will have several separate enclosed shielded rooms on top. These rooms will contain a solids separator, block valves as part of the transport air system, forced air blowers, HEPA filters, and instrumentation.

After filling, the bins will be vented through the bin vent system. All vented air will be filtered prior to discharge to the atmosphere and the fission product release will be well below the Federal emission standards. The bin vault cooling air will be rough filtered prior to entering the vault and will normally be discharged unfiltered through a stack by either natural or forced convection. This air will be monitored continuously for airborne radioactive particulate. Should the monitor detect radioactive particulate, the control system will automatically start a forced air blower and will automatically divert the cooling air through HEPA filters.

The solids storage facility will include provisions for retrieval of the calcined solids for possible shipment to a federal repository if this becomes desirable.

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

Radioactive liquid wastes are produced from the reprocessing of spent reactor fuel at the ICPP. A major portion of this spent fuel is from Navy Propulsion Reactors. The NWCF converts highly radioactive liquid waste to granular solids by calcination. This CSSF project will provide facilities for safe and economical storage of the radioactive calcined solids. Additional calcined solids storage is required if the NWCF is to continue operation after second quarter FY 1990 as all available storage space will be filled at that time. In order to meet this programmatic need date and continue reduction in the inventory of the high level radioactive liquid waste tanks, fabrication of the bins must commence in FY 1985. Fabrication at that time is necessary to guarantee their delivery to meet the construction schedule. A delay in funding would cause the programmatic need date to be missed. Funding in 1985 will be used to place a fabrication order for the bin internals and anchoring mechanisms (25 month lead time), and for site preparation, design, and project management.

Should the NWCF and ICPP be shut down due to lack of waste storage, the Navy's nuclear program would be adversely affected. Shutdown would also defer recovery of valuable enriched uranium resources and the return of these resources to productive use. A year delay in funding for the seventh CSSF would necessitate a shutdown of the NWCF for approximately nine months, since the NWCF requirement for the Seventh CSSF in 1989 doesn't allow construction to begin any later than FY 1985.

Continued fuel reprocessing at the ICPP without waste calcination would require construction of additional high-level radioactive liquid waste tanks. However, additional liquid waste storage is not acceptable because of economic, safety, and environmental factors. Storage of high-level radioactive waste in the liquid form has a significantly higher risk of leakage of fission products to the environment. Conversion of high-level waste to solids for subsequent storage

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Seventh Calcined Solids Storage Facility
Idaho Chemical Processing Plant,
Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-157

9. Purpose, Justification of Need, and Scope of Project: (cont'd.)

provides: (a) improved safety, (b) greater assurance of isolation from man's environment, (c) minimal reliance on continued maintenance and surveillance, (d) lower overall costs for waste management, and (e) reduced volume storage requirement (reduction in volume of about 7:1).

10. Details of Cost Estimate:(a)

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design, inspection and project management at 18% of construction costs, item b.		\$ 3,000
b. Construction costs		16,950
1. Improvements to land	\$ 620	
2. Building and other structures	9,740	
3. Utilities	90	
4. Government Furnished Equipment	6,500	
Subtotal		<u>19,950</u>
c. Contingency @ approximately 20% of above costs		<u>4,050</u>
Total Project Cost		\$24,000

11. Method of Performance:

The design work will be accomplished by an outside architect engineer in conjunction with the operating contractor to the extent feasible, construction and procurement will be accomplished by a fixed - price contract and awarded on the basis of competitive bids.

(a) The above estimates are based on 100% of Conceptual Design complete. Advanced conceptual design will be completed in FY 1984.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Seventh Calcined Solids Storage Facility
Idaho Chemical Processing Plant,
Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-157

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

A. <u>Total Project Cost</u>	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>Total</u>
1. Total Facility Cost							
a. Construction Line Item	\$ 0	\$ 3,300	\$ 6,200	\$ 6,900	\$ 5,500	\$2,100	\$ 24,000
b. PE&D	0	0	0	0	0	0	0
c. Expense Funded Equipment	0	0	0	0	0	0	0
d. Inventories	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Facility Costs	\$ 0	\$ 3,300	\$ 6,200	\$ 6,900	\$ 5,500	\$2,100	\$ 24,000
2. Other Project Costs							
a. R&D Necessary to							
Complete Construction	\$ 390	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 390
Other Project Related Costs	<u>0</u>	<u>320</u>	<u>370</u>	<u>380</u>	<u>390</u>	<u>430</u>	<u>1,890</u>
Total Other Project Costs	\$ <u>390</u>	\$ <u>320</u>	\$ <u>370</u>	\$ <u>380</u>	\$ <u>390</u>	\$ <u>430</u>	\$ <u>2,280</u>
Total Project Costs	\$ <u>390</u>	\$ <u>3,620</u>	\$ <u>6,570</u>	\$ <u>7,280</u>	\$ <u>5,890</u>	\$ <u>2,530</u>	\$ <u>26,280</u>

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of project: Seventh Calcined Solids Storage Facility
Idaho Chemical Processing Plant,
Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-157

B. Other Related Funding Requirements:

1. Facility Operating Costs (annual)	\$ 35
2. Programmatic operating Expenses Directly Related to the Facility	0
3. Capital equipment not related to construction but related to the programmatic effort in the facility	0
4. GPP or other construction related to programmatic effort in the facility	0
5. Other Costs	0
Total Other Related Annual Funding Requirements	<u>\$ 35</u>

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

A. Total Project Costs

1. Total Facility Costs

- a. Construction Line Item - No narrative required
b. PE&D - No narrative required
c. Expense Funded Equipment - No narrative required
d. Inventories - No narrative required

2. Other Project Costs

- a. R&D Necessary to complete construction - Funding in this category is necessary for conceptual design.^{a/}
b. Other Project Related Costs - Funding in this category is for project support that is necessary during design and construction and for training and startup costs.

B. Other Related Funding Requirements

1. Facility Operating Cost - Annual operational cost while filling the bins is estimated at \$35,000. After the bins have been filled, surveillance and maintenance costs are estimated at \$25,000 per year for 5 to 10 years. After this period, annual costs will be negligible.

^{a/} Operating costs and programmatic effort for NWCF will not change from that presently budgeted after construction of this facility.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Seventh Calcined Solids Storage Facility
Idaho Chemical Processing Plant
Idaho National Engineering Laboratory, Idaho

2. Project No. 85-D-157

13. Narrative Explanation of Total Project Funding and Other Related Funding Requirements: (cont'd.)

2. Programmatic operating expenses related to the facility - Operating costs and programmatic effort for NWCF which this facility supports will not change from that presently budgeted when this facility is constructed.
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 - No narrative required.
5. Other costs - No narrative required.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

1. Title and Location of Project: Central warehouse upgrade, Richland, Washington	2. Project No. 85-D-158
3. Date A-E Work Initiated: 2nd Qtr. FY 1985	5. Previous Cost Estimate: None
3a. Date Physical Construction Starts: 2nd Qtr. FY 1986	6. Current Cost Estimate: \$ 13,000 Less Amount for PE&D 0 Net Cost Estimate: \$ 13,000 Date: 4/83
4. Date Construction Ends: 4th Qtr. FY 1987	

7. Financial schedule:

	<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriation</u>	<u>Obligation</u>	<u>Costs</u>
650	1985	\$ 700	\$ 700	\$ 700	\$ 140
	1986	12,300	12,300	12,300	10,000
	1987	0	0	0	2,860

8. Brief physical description of project:

This project will provide a new warehouse facility for the Hanford Site. Included in the project is the construction of approximately 133,000 square feet of warehouse area, approximately 22,500 square feet of office space, and the required site work (parking lots, utilities, and drainage systems) necessary to operate the facility. Support furnishings and moveable equipment will be relocated from the existing building to the new building. Additional racks or bins required will be furnished by the project.

As currently planned the project scope will include the following:

A. Improvements to Land

The replacement warehouse will be located on a vacant lot near the existing Central Warehouse Building. Sufficient parking to accommodate building occupants will be provided. The entrances to Route 4 from the warehouse will be designed consistent with standard plans for highway design.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Central warehouse upgrade,
Richland, Washington

2. Project No. 85-D-158

8. Brief Physical Description of Project: (cont'd.)

B. Buildings

1. Central Warehouse Building

The warehouse building will consist of a warehouse/office area on the first floor (approximately 127,500 sq.ft.) and an office area on a mezzanine (approximately 22,500 sq. ft.).

2. Flammable Storage Building

A building approximately 5,000 square feet will be erected to store flammable materials and liquids.

C. Other Structures

Nitrogen Bottling Facility

The existing storage tank will be relocated by this project. A building of approximately 500 square feet will be erected adjacent to this tank.

D. Special Facilities and Equipment

Special facilities and equipment currently envisioned include dock levelers, truck scales, pallet rack, dock shelters and cool room for required refrigerated storage.

E. Utilities

Utilities required for the operation of the warehouse will be provided. Utilities currently envisioned include: electrical power, communication system (telephones), fire alarm system, sanitary and fire water supply, sanitary sewer, storm sewer and natural gas supply.

The 1985 appropriation is planned to fund Definitive Design and preparation of bid packages. The fixed-price construction packages would be awarded in Fiscal Year 1986 with construction being completed in 1987.

The existing warehouse will be excessed to be demolished.

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

The primary warehouse and stores facility for the Hanford Site has major structural, electrical and mechanical problems as well as built-in operational inefficiencies.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Central warehouse upgrade,
Richland, Washington

2. Project No. 85-D-158

9. Purpose, Justification of Need and Scope of Project: (cont'd.)

Cost analysis indicates that rehabilitation of the structure, heating and insulation system, sprinkler system and lighting would cost approximately 65% of the replacement cost of the building. That expenditure would not resolve the space problems requiring leased space and the use of trailers as permanent offices. Potential operational savings of approximately \$230,000 per year would not be realized due to the current warehouse clear heights and configuration.

A history of structural problems, normally roof structural member failures, have been experienced in the existing building. This resulted initially with the reinforcement of the roof truss system in 1962. In 1973 there was a partial collapse of the roof. Since the collapse, regular inspections have been made of the entire truss system. Individual truss members have been reinforced or replaced following the inspections. In 1976, in order to limit wall movement, external structural steel wall braces were placed on the south wall and horizontal structural steel trusses were installed along the outer walls. In 1978, approximately 40 roof trusses were replaced or reinforced and all the concrete walls were repaired to limit rebar corrosion.

These repairs and modifications appear to have had limited success in reducing the number of recurring cracks in the walls and pilasters. However, they do not increase the load capacity of the roof. The 1981 inspections of the roof support truss system increased the concerns, and braces and trusses had to be stiffened with the addition of steel plates to the wood braces. The 1983 inspection discovered the structural integrity of the building is suspect for the following reasons:

- o Present observations have noted that existing sags in the roof deck allow rain water to pond 4 to 5 inches deep. The weight of the accumulated water could further sag the deck and increase the load on the roof and further exceed the 20 PSF live load capacity of the roof system. Personnel are dispatched to remove standing water and/or snow, however, this cannot always prevent the short term overload of the roof.
- o The existing structure does not satisfy the seismic regulations of the Uniform Building Code and would fail under low lateral forces.
- o Wood members of the roof structure have deteriorated due to overstress, weathering, and leakage resulting in unknown actual strength.
- o The structure is too flexible to limit wind deflections which result in cracks in the walls and leaks in the built-up roof.

A recent inspection of the electrical system revealed signs of deteriorated insulation on existing circuit wiring. The lighting in the storage areas is by incandescent lamps that provide a level of illumination of approximately 5 foot candles (F.C.), which is well below the minimum recommended light level of 20 F.C.

The existing walls and ceiling also are not insulated resulting in excessive energy consumption for heating and cooling. During the summer, the warehouse is ventilated with ceiling mounted ventilators that function by air convection, and by

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Central warehouse upgrade,
Richland, Washington

2. Project No. 85-D-158

9. Purpose, Justification of Need and Scope of Project: (cont'd.)

opening exterior overhead doors. The building is closed in the evenings and on weekends. The heat buildup during these closed periods causes the temperature to rise in excess of 150°F near the ceiling when the ambient temperature reaches 105°F. The offices are cooled with evaporative coolers and individual air conditioners. The offices within the warehouse exhaust the heat from their air conditioners directly into the warehouse compounding the ventilation problem.

Building heating is provided by the originally installed oil-fired steam boiler. Recurring malfunctions and general maintenance of the system indicate the need for replacement. The existing system is inefficient compared to current technology. A heating system retrofit has been previously proposed as an energy conservation project.

The total sprinkler system has had only limited upgrade since installation almost 30 years ago. The water lines to the sprinkler system are old and corroded and it is doubtful that all the sprinklers are functional. Additionally, during a recent fire protection survey, it was determined that an alternate means of egress is required in the corridor of Bay #1 to conform with the National Fire Code requirements.

Inadequate office and warehouse space has resulted in the need to rent warehouse space and install trailers for office space. Renting permanent space is not cost effective and using trailers for permanent offices is not appropriate.

The uncertainty of the load carrying capacity of the roof under high wind conditions, as well as the known potential to accumulate roof overload during rain and snow storms, is cause for concern for the safety of the occupants and the protection of the material in the building.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Central warehouse upgrade,
Richland, Washington

2. Project No. 85-D-158

10. Details of Cost Estimates^{a/}:

Total Cost

- a. Engineering, design and inspection at approximately
7 percent of construction

\$ 768

- b. Construction costs

\$ 10,457

1. Site work - excavating, grading, drainage,
paving, parking, fencing, exterior lighting, pedestrian
access walks, landscaping, relocation \$ 460
2. Building - insulation, heating, air conditioning,
doors, windows, concrete, finishes \$ 8,800
(a) Warehouse - 133,000 ft² @ \$52/ft²
(b) Office - 22,500 ft² @ 84/ft²
3. Other Structures - Nitrogen Facility \$ 90
4. Utilities - electrical, air, water, and gas service \$ 540
5. Special Equipment - (Dock Leveler, weigh scales
bins and racks) \$ 500
6. Warehouse stock and equipment move \$ 67

Subtotal

\$ 11,225

- c. Contingency at approximately 16% of above costs

\$ 1,775

Total project cost

\$ 13,000

11. Method of performance:

Design will be accomplished by an offsite architect-engineer contractor. Construction and procurement will be fixed price awarded on the basis of competitive bids.

^{a/} Based on a completed Engineering Study and 90% completion of the Conceptual Design Report.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Central warehouse upgrade,
Richland, Washington

2. Project No. 85-D-158

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

	<u>Prior yrs.</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>Total</u>
a. Total project funding					
1. Total facility costs					
(a) Construction Line Item	\$ 0	\$ 140	\$10,000	\$ 2,860	\$13,000
Total facility costs	\$ 0	\$ 140	\$10,000	\$ 2,860	\$13,000
2. Other project funding					
(a) R&D necessary to complete construction	\$ 163	\$ 0	\$ 0	\$ 163	
(b) Other project related cost	0	100	80	70	250
Total other project funding	<u>163</u>	<u>100</u>	<u>80</u>	<u>70</u>	<u>413</u>
Total project funding (Item 1 and Item 2)	<u>\$ 163</u>	<u>\$ 240</u>	<u>\$10,080</u>	<u>\$ 2,930</u>	<u>\$13,413</u>
b. Total related funding requirement (estimated life of project: 25 years)					
(1) Facility operating costs			\$ 50*		
(2) Programmatic operating expenses directly related to the facility			0		
Total other related annual funding requirements			<u>\$ 50</u>		

13. Narrative explanation of total project funding and other related funding requirements:

- a. Total project funding
1. Total facility
- (a) Construction Line Item - no narrative required.
2. Other project funding
- (a) R&D necessary to complete construction - The conceptual design effort for this project is \$163,000.
- (b) Other project related funding - These costs are associated with project support and management, and design review

*This compares with \$184,000, current facility operating costs.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and Location of Project: Central warehouse upgrade,
Richland, Washington	2. Project No. 85-D-158
13. Narrative explanation of total project funding and other related funding requirements: (cont'd.)
- b. Total related funding requirement - The facilities have an estimated life of 25 years.
 - 1. Facility operating costs - After installation, there will be minor operating costs involving maintenance and repair activities.
 - 2. Programmatic operating expenses directly related to the facility - the facility will have an annual operating budget of approximately \$8,400,000, which is liquidated to other projects and contractors through material overhead.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

1. Title and location of project: New Waste Transfer Facilities, H Area
Savannah River, South Carolina
2. Project No.: 85-D-159
3. Date A-E work initiated: 1st Quarter FY 1985
5. Previous Cost Estimate: None
- 3a. Date physical construction starts: 4th Quarter FY 1985
6. Current Cost Estimate: \$45,000
Less Amount for PE&D: 0
Net Cost Estimate: \$45,000
Date: 1/83
4. Date construction ends: 1st Quarter FY 1989

7. Financial Schedule:

<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$11,000	\$11,000	\$11,000	\$ 2,850
1986	11,000	11,000	11,000	9,580
1987	20,410	20,410	20,410	19,620
1988	2,590	2,590	2,590	12,950

8. Brief Physical Description of Project:

This project will replace the existing H-Area Diversion Box 2 (HDB-2) transfer facility with one of current design. This facility is designed to transfer waste between the Type III tanks in the east and west H-Area tank farms and between F and H Areas. This facility would have the capability included in the design to transfer and receive waste from the proposed Defense Waste Processing Facility (DWPF). This project will include all required transfer piping and equipment, instrumentation and controls to operate this system safely and within current operating technical standards.

This facility will consist of a new diversion box with jumpers and service piping approximately twice as large as that provided at HDB-7. This diversion box will provide three lines to the existing inter-area line (IAL); two for existing lines and one for future use. It will also provide two lines to HDB-6, two lines to HDB-5, four lines to HDB-7 and eight for future long-term waste programs. These lines will be stainless steel core and carbon steel jacket, both designed for infinite stress cycle life. In conjunction with this diversion box, four pump pits will be constructed. These pump pits should be equipped with pump tanks, separable overhung shaft pumps, emergency transfer jets, sump jets, agitators, cooling coils and associated pump pit instrumentation.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: New Waste Transfer Facilities, H Area
Savannah River, South Carolina

2. Project No. 85-D-159

8. Brief Physical Description of Project: (contd.)

Design will include determination of the practicality of providing an enclosure around the facility and an overhead crane within it. The project will include these items, if practical.

Pump pits and diversion box will be of current design with all stainless steel liner and underliner leak detection capabilities. Provide all services such as steam, electrical, emergency power, plant air, instrument air, breathing air, cooling water, flush water, domestic water, etc. All gang valves will be motorized mechanical gang valves with remote and local operations capabilities. Alarms and controls for this diversion box and pump pit complex will be in the new control room in H Area. A ventilation system similar to that provided for H Pump Pit (HPP) HPP-5 & 6 will be provided. Area lighting and communications system will be provided.

This project will be consistent with the Savannah River Quality Assurance Manual. The new transfer complex will comply with all applicable criteria for a nuclear facility and be designed to reduce radiation exposure to operating and maintenance personnel to a minimum. Design and components will be such that maintenance is minimal.

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

A new waste transfer facility will be required in 1989 to continue H-Area tank farm operations after Type I, II, and IV waste tanks are retired from service and to interface with the Defense Waste Processing Facility. The new facility will perform the following functions in H Area:

o Replace Existing HDB-2 and HPP-1-4

Type III tanks in H Area are divided into two groups which are separated by Type I, II and IV tanks. Seven Type III tanks are on the west side of the tank farm and ten new Type III tanks (FY 76 and 78) are on the east side. Routine transfers of supernate and processed sludge will be required between the two tank groups. Diversion box 2 and pump pits 1-4 connect the two sets of H-Area tanks and also tie in the F-Area transfer lines.

The 25-year-old HDB-2 complex lacks full height stainless steel cell liners, jacketed transfer line wall penetrations and full leak detection capability which are included in current design criteria for secondary containment of radioactive waste. Transfer lines in and out of the HDB-2 complex have only a concrete encasement and catch tank for secondary containment. All other transfer lines located in this concrete encasement will be abandoned upon retirement of Type I tanks in H Area.

The HDB-2 complex ventilation system does not meet current design criteria for preventing an atmospheric release of radioactivity. Also, pump pits 1-4 are not designed to accept the new separable overhung shaft pump which reduces radiation exposure to personnel.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: New Waste Transfer Facilities, H Area
Savannah River, South Carolina

2. Project No. 85-D-159

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

Because of these reasons, a replacement for HDB-2 is required. To reduce radiation exposure and contamination potential associated with facilities such as HDB-2, use of an enclosure and overhead crane in the new facilities will be evaluated.

o Expand H-Area Transfer Facilities for DWPF

The Defense Waste Processing Facility will create new requirements for waste transfer facilities, which will be met by this project. In addition to increased waste transfers from F to H Area, transfers of large amounts of contaminated water from DWPF to H Area and waste from H Area to DWPF will be made daily. The new Waste Transfer Facility must be operating in time to interface with DWPF, approximately 1989, because HDB-2 does not have enough nozzle penetrations to accommodate these new lines.

Cost and other miscellaneous data associated with this project are as follows: The new Waste Transfer Facility will not require additional Waste Management personnel. Annual operating expenditures are to be \$800,000. Conceptual design costs will total \$550,000 for the project. Design Liaison costs prior to authorization will total \$300,000. The 1985 funding will be used for design (\$3,000,000) and the initiation of construction, including long lead procurement and site preparation (\$8,000,000).

10. Details of Cost Estimate:

<u>Item</u>	<u>Item Cost</u>	<u>Total Cost</u>
A. Engineering Design & Inspection at approximately 26% of Construction Costs, Item B		\$ 7,110
B. Construction Costs		27,290
1) Improvements to Land	\$1,865	
a) Roads, Walks & Fences	\$1,250	
b) Excavation & Grading	495	
c) Landscaping, Erosion & Backfill	120	
2) Buildings	475	
a) Control House - 241-28H Addition - 645SF	180	
b) Enclosure	295	
3) Other Structures	6,900	
a) Diversion Box No. 8	1,800	
b) Pump Pits 7, 8, 9 & 10	5,100	

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: New Waste Transfer Facilities, H Area
Savannah River, South Carolina

2. Project No. 85-D-159

10. Details of Cost Estimate: (contd.)

4) Special Facilities	17,030	
a) Equipment (including overhead crane)	4,200	
b) Piping	9,630	
c) Instruments	1,550	
d) Electrical	1,650	
5) Utilities	1,020	
a) Service Piping	330	
b) Storm Water System	280	
c) Emergency Power Diesel	280	
d) Communications	40	
e) Fence, Road & Area Lighting	90	
C. Removal Costs		<u>200</u>
Subtotal (Items A&B&C) ^u		\$34,600
D. Contingencies at Approximately 25% of Above Costs		8,700
E. Design and Construction Liaison		<u>1,700</u>
F. Total Project Cost ^(a)		\$45,000

11. Method of Performance:

Design will be performed by the operating contractor. Construction and procurement will be accomplished by the operating contractor, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

(a) This estimate is based on approximately 100% complete conceptual design.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: New Waste Transfer Facilities, H Area
Savannah River, South Carolina

2. Project No. 85-D-159

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

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>Total</u>
A. Total Project Funding						
1. Total Facility Costs						
a. Construction Line Item	0	\$2,250	\$8,980	\$19,320	\$12,750	\$43,300
b. PE&D	0	0	0	0	0	0
c. Expense Funded Equipment	0	0	0	0	0	0
d. Inventories	0	600	600	300	200	1,700
Total Facility Costs	0	\$2,850	\$9,580	\$19,620	\$12,950	\$45,000
2. Other Project Funding						
a. R&D Necessary to Complete Construction	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
b. Conceptual Design Costs	500	50	0	0	0	550
c. Other Project Related Costs	300	0	0	0	0	300
Total Other Project Funding	\$ 800	\$ 50	\$ 0	\$ 0	\$ 0	\$ 850
Total Project Funding (Items 1&2)	\$ 800	\$2,900	\$9,580	\$19,620	\$12,950	\$45,850

B. Total Related Funding Requirement (Estimated life of Project: 40 years)

	<u>Annual Cost</u>
1. Facility Operating Costs	\$800
2. Programmatic Operating Expense Directly Related to the Facility	0
3. Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility	0
4. GPP or Other Construction Related to the Programmatic Effort in the Facility	0
Total Related Annual Funding Requirements	\$800

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: New Waste Transfer Facilities, H Area
Savannah River, South Carolina

2. Project No. 85-D-159

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

A. Total Project Funding

1. Total Facility Costs

- a. Construction Line Item
- b. PE&D
No PE&D Funding is Required
- c. Expense Funded Equipment
No Expense Funded Equipment is Required
- d. Inventories
No Inventories are Needed for the Proposed Facilities
- e. Design and Construction Liaison
Includes liaison and startup costs.

2. Other Project Funding

- a. R&D Not Required.
- b. Conceptual design and engineering studies including preparation of a cost estimate for project authorization and improving equipment design.
- c. Other project related costs - Plant liaison prior to authorization.

B. Total Related Funding Requirements

1. Facility Operating Costs

This cost is \$800,000 annually for a full staff of operating and support personnel to operate on a 7-day, 4-shift schedule.

2. Programmatic Operating Expenses Directly Related to the Facility

None

3. Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the facility.

None

4. GPP or other Construction Related to Programmatic Effort

None

5. Other Costs

None

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
CONSTRUCTION PROJECT DATA SHEETS
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

(Tabular Dollars in Thousands, Narrative Material in Whole Dollars)

1. Title and location of project: Test Reactor Area Security System Upgrade,
Idaho National Engineering Laboratory (INEL)	2. Project Number: 85-D-160
3. Date A-E work initiated: 2nd Quarter FY 1985	5. Previous cost estimate: None
Date: N/A
3a. Date physical construction starts: 4th Quarter FY 1986	
4. Date construction ends: 1st Quarter FY 1988	6. Current cost estimate: \$ 7,000
Less amount for PE&D: 0
Net estimate: \$ 7,000
Date: 1/84

7. Financial schedule:

<u>Fiscal Years</u>	<u>Authorization</u>	<u>Appropriation</u>	<u>Obligations</u>	<u>Costs</u>
1985	\$ 2,000	\$ 2,000	\$ 2,000	\$ 1,200
1986	2,250	2,250	2,250	2,000
1987	2,750	2,750	2,750	3,000
1988	0	0	0	800

8. Brief physical description of project:

This project will enhance the intrusion and sabotage prevention at the Test Reactor Area (TRA) located at the Idaho National Engineering Laboratory (INEL) and will increase the physical protection of the Advanced Test Reactor (ATR) plant components and Special Nuclear Materials (SNM) housed within the TRA. State-of-the-art detection and intrusion control systems will be utilized, and equipment and methodology resulting from ongoing DOE research programs will be incorporated into the design of four subprojects whose completion will accomplish the goals set forth in the TRA Security Plan.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Test Reactor Area Security System Upgrade,
Idaho National Engineering Laboratory (INEL)

2. Project Number: 85-D-160

10. Details of cost estimate:

	<u>Items Cost</u>	<u>Total Cost</u>
(a) Engineering, design, inspection and project management at 23% of item b.		\$ 1,078
(b) Construction costs		4,630
(1) Improvements to land	\$ 0	
(2) Building and structures	541	
(3) Utilities	2,655	
(4) Equipment	1,434	
(5) Demolition and removal	0	
Subtotal		\$ 5,708
(c) Contingency at 23% of above costs		1,292
Total Project Cost		<u>\$ 7,000</u>

The conceptual design on this project is 100% complete.

EDI or contingency may be higher than anticipated because of the technical nature of some subproject designs and unforeseen demolition and removal.

11. Method of performance:

Overall responsibilities for design and construction will be assigned to the INEL prime contractor administered by DOE-ID. The INEL contractor will provide technical direction of the design effort. Construction will be accomplished by subcontracts awarded on the basis of competitive bidding.

12. Funding schedule of project funding and related funding requirements:

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>Total</u>
A. Total project funding						
1. Total facility funding						
(a) Construction line item	\$ 0	\$ 1,200	\$ 2,000	\$ 3,000	\$ 800	\$ 7,000
(b) PE&D	0	0	0	0	0	0
(c) Expense funded equipment	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0
Total facility costs	<u>\$ 0</u>	<u>\$ 1,200</u>	<u>\$ 2,000</u>	<u>\$ 3,000</u>	<u>\$ 800</u>	<u>\$ 7,000</u>

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Test Reactor Area Security System Upgrade,
Idaho National Engineering Laboratory (INEL)

2. Project Number: 85-D-160

12. Funding schedule of project funding and related funding requirements (contd.)

	<u>Prior Years</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>Total</u>
2. Other project funding						
(a) R&D necessary to construction	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
(b) Conceptual design costs	60	0	0	0	0	60
(c) Other project related costs	0	0	0	0	0	0
Total other project funding	\$ 60	\$ 0	\$ 0	\$ 0	\$ 0	\$ 60
 Total project funding (items 1 & 2)	<u>\$ 60</u>	<u>\$ 1,200</u>	<u>\$ 2,000</u>	<u>\$ 3,000</u>	<u>\$ 800</u>	<u>\$ 7,060</u>

B. Other related funding requirements (estimated life of project: 10 years)

1. Facility maintenance and operating costs	\$ 2,000
2. Programmatic operating expense directly related to the facility	0
3. Capital equipment not related to construction but related to programmatic effort	0
4. GPP or other construction related to programmatic effort	0
Total other related funding requirements	<u>\$ 2,000</u>

13. Narrative explanation of total project funding and other related funding requirements:

A. Total project funding

1. Facility installation and development work will be required for the perimeter of TRA and ATR and may include a new building of about 2,500 square foot floor space and including a basement. Electric heating with air-conditioning of sensitive electronic equipment will be provided. Lighting of the perimeters will use backup diesel electric power for one-half of the system. Sewer, water and regular commercial power are provided and will be reused. Paved parking areas and street extensions are included.
2. Conceptual design is 100% complete.

B. Total related funding requirements - it is estimated that the facility will be used 10 years.

1. Facility operating costs - these costs include security force, personnel demands, building energy and maintenance support, and also maintaining equipment performance.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Test Reactor Area Security System Upgrade,
Idaho National Engineering Laboratory (INEL)

2. Project Number: 85-D-160

13. Narrative explanation of total project funding and other related funding requirements (contd.)

- 2. Programmatic operating expense directly related to the facility - none.
- 3. Capital equipment not related to construction but related to programmatic effort - none.
- 4. GPP or other construction related to programmatic effort - none.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS

Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

1. Title and location of project: Additional radioactive waste storage facilities, Richland, Washington	2. Project No. 83-D-157
3. Date A-E work initiated: 1st Qtr. FY 1981	5. Previous cost estimate: \$ 62,155
Date: 4/82
3a. Date physical construction starts: 1st Qtr. FY 1983	6. Current cost estimate: \$ 55,075
Less amount for PE&D: 1,920
Net cost estimate: \$ 53,155 ^{a/}
Date: 1/84
4. Date construction ends: 4th Qtr. FY 1986	

7. Financial schedule:

	<u>Fiscal year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
607	1983	\$ 19,000	\$ 19,000	\$ 19,000	\$ 7,510
	1984	31,000	31,000	31,000	19,300
	1985	3,155	3,155	3,155	9,360
	1986	0	0	0	16,985

8. Brief physical description of project:

This project will provide eight additional underground double-shell tanks for high-level radioactive waste; encased piping to existing waste crystallizer and storage tank systems; instrumentation and auxiliary equipment for monitoring; and additional support and auxiliary facilities and improvements for controlling radioactive waste to minimize the potential for leakage to the environment.

^{a/} The reduction in the TEC of \$9,000,000 reflects the deletion of an acid waste transfer line between the PUREX facility and B-Plant from the program scope, and favorable bid estimates anticipated for the final phase of the project

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Additional radioactive waste storage facilities, Richland, Washington

2. Project No. 83-D-157

8. Brief physical description of project: (cont'd)

The tanks will be designed similarly to existing one-million-gallon double-shell tanks, which consist of a free-standing, stress-relieved, carbon steel tank within a carbon steel-lined, reinforced concrete vault. The tanks will be equipped with pumps, pump pits, slurry distributors, circulators as required, integral leak detection, radiation, temperature, pressure, liquid level, and sludge level instrumentation, high efficiency filter systems for ventilation exhaust, utilities, instrument air, area radiation alarms, and controls.

The tanks will be instrumented to detect any leakage from the primary to the secondary shell. Equipment will be available for removing the waste from the secondary shell, if required. Exhaust air will be double-filtered through high-efficiency filters. Measurement of radioactivity released to the environment will be continuous, and concentration of radioisotopes released will be maintained below agency guidelines. Liquid level and temperature instrumentation will be monitored by the Computer Automated Surveillance System. Heat-traced and encased piping will be provided for: (a) transferring waste supernate from new tanks to the waste evaporation facilities; (b) transferring concentrate from the waste evaporation facility back to the new tanks; and (c) transferring waste to and from other facilities, as required. The pipelines will be constructed with encasements for secondary containment of the radioactive waste. Leak detection devices and pressure testing capabilities will be provided for the encased piping to permit routine monitoring for leaks. Leakage into the encasement due to failure of the primary piping will drain to and be collected in double-contained waste storage tanks or catch tanks as required. The support and auxiliary facilities and improvements for control of radioactive waste will include diversion boxes, valve pits, control rooms, provisions to reduce radiation exposure, and improvements to evaporation facilities and other processes for volume reduction of high-level waste. The FY 1985 funding is required to complete construction.

9. Purpose, justification of need for, and scope of project:

Purpose: The proposed waste storage facilities are required for storage of radioactive waste at the Hanford Site from: (a) the restart of PUREX, (b) the interstitial liquid from the stabilization of single-shell tanks; and (c) the conversion of N Reactor from the production of fuel grade to weapon-grade plutonium and extension of its operation to the mid-1990's.

Justification: A major goal was reached in FY 1981 with the removal of all 149 old single-shell high-level waste tanks from active liquid service which is now provided exclusively in double-shell tanks. The tanks and auxiliary facilities proposed in this project will help stabilize waste in the old single-shell tanks by accepting drainable liquids that are now held interstitially in the salt cake material. This reduces the potential for accidental release of radioactive waste to the environment.

Earlier estimates of required waste storage capacity were based on the assumption that N Reactor would operate only through 1983 and produce fuel grade plutonium as opposed to weapons grade plutonium. The decisions to convert from fuel grade plutonium to weapons grade plutonium and to extend the operation of N Reactor through mid-1990's will increase the amount of fuel to be processed through the PUREX reprocessing plant, thereby increasing the amount of waste which will be generated and will require storage.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Additional radioactive waste storage facilities, Richland, Washington
2. Project No. 83-D-157
9. Purpose, justification of need for, and scope of project: (Cont'd.)

Failure to provide this project would cause one or more of the following impacts:

- o The removal of interstitial drainable liquids from the salt cake stored in single-shell waste storage tanks would be delayed, thereby increasing the potential leakage of liquids from cracked tanks.
- o N Reactor operations would have to be curtailed, new fuel storage space would have to be constructed, or radioactive fuel shipments would have to be made to other processing facilities.

These tanks will also provide storage capacity for liquid waste from other Hanford operations.

Scope: This project includes the engineering, design, inspection, land improvement, and procurement for the construction of eight double shell waste tanks and auxiliary facilities at Hanford.

10. Details of cost estimate^{a/}:

	<u>Item Cost</u>	<u>Total Cost</u>
a. Engineering, design and inspection at approximately 9% of construction costs, item b		\$ 4,029 ^{a/}
b. Construction costs		\$ 43,263
(1) Improvements to land including excavation, backfill, and grading	\$ 1,551	
(2) Special facilities including one-million-gallon storage tanks, collection tanks, piping, instrumentation and ventilation systems	41,510	
(3) Utilities, including electrical power, water, and steam	202	
Subtotal		\$ 43,263
c. Contingency @ approximately 12% of above costs		5,863
Total Estimated Cost		\$ 53,155

^{a/} Based on completed conceptual design and approximately 98% completed definitive design (excludes PE&D).

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Additional radioactive waste storage facilities, Richland, Washington

2. Project No. 83-D-157

11. Method of performance:

Design will be performed under a negotiated architect-engineer contract. The major portion of construction and procurement will be accomplished under fixed-price contracts awarded competitively. A small amount of work, primarily tie-ins to contaminated waste lines within potentially contaminated zones, will be done by the onsite contractor. The project schedule and funding requirements reflect early placement of orders for long-lead time items.

12. Funding schedule of project funding and other related funding requirements:

	<u>Prior yrs.</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>Total</u>
a. Total project costs							
1. Total facility costs							
(a) Construction line item	\$ 0	\$ 7,510	\$ 19,300	\$ 9,360	\$ 16,985	\$ 0	\$ 53,155
(b) PE&D	1,920	0	0	0	0	0	1,920
(c) Expense funded equipment	0	0	0	0	180	30	210
Total facility costs	1,920	7,510	19,300	9,360	17,165	30	55,285
2. Other project costs							
(a) R&D necessary to complete construction .	\$ 250	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 250
(b) Other project related costs	710	480	530	580	580	175	3,055
Total other project costs	960	480	530	580	580	175	3,305
Total project costs (item 1 & item 2).	<u>\$ 2,880</u>	<u>\$ 7,990</u>	<u>\$ 19,830</u>	<u>\$ 9,940</u>	<u>\$ 17,745</u>	<u>\$ 205</u>	<u>\$ 58,590</u>
b. Other related annual costs (estimated life of project: 50 years)							
1. Facility operating costs							\$ 550
2. Capital equipment not related to construction but related to the operating effort in the facility							60
Total other related annual costs							<u>\$ 610</u>

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Additional radioactive waste storage facilities, Richland, Washington

2. Project No. 83-D-157

13. Narrative explanation of total project funding and other related funding requirements:

a. Total project funding

1. Total facility costs

(a) Expense funded equipment

These funds will provide critical spare parts (pumps, piping, etc.) needed to operate this facility.

2. Other project costs

(a) R&D necessary to complete construction

The conceptual design effort for this project is complete.

(b) Other project related costs

These costs are associated with project management activities and include design review, safety reviews, technical direction, quality assurance, radiation monitor coverage, etc.

b. Total related funding requirements

1. Annual operating expenses directly related to the facility

These costs are associated with the cost of operating the waste storage tank farm. They include utilities, maintenance and repairs, operations surveillance, engineering and other related expenses. Total waste concentration operating cost for Hanford is approximately \$16,000,000 per year.

2. Capital equipment not related to construction but related to operating the facility

This cost includes equipment for the minor upgrading of facilities to improve monitoring, surveillance and containment, and facilities or modifications to reduce environmental releases and personnel exposure.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS

Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

1. Title and location of project: Waste handling and isolation facilities, Richland, Washington	2. Project No. 82-N-103
3. Date A-E work initiated: 4th Qtr. FY 1979	5. Previous cost estimate: \$34,450
Date: 2/81
3a. Date physical construction starts: 2nd Qtr. FY 1982	6. Current cost estimate: \$36,000
Less amount for PE&D: 1,550
Net cost estimate: \$34,450
Date: 1/82
4. Date construction ends: 2nd Qtr. FY 1990	

7. Financial schedule:

<u>Fiscal year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1982	\$ 34,450	\$ 10,000	\$ 10,000	\$ 826
1983	0	7,000	7,000	4,528
1984	0	3,570	3,570	10,502
1985	0	9,700	9,700	8,500
1986	0	4,180	4,180	4,600
1987	0	0	0	2,000
1988	0	0	0	1,500
1989	0	0	0	1,500
1990	0	0	0	494

8. Brief physical description of project:

This project will provide the facilities, processes and/or structures for the isolation of single shell waste storage tanks, surveillance instrumentation to monitor waste storage tanks, and measures to minimize the potential for release of radioactive materials to the environment.

The following are representative examples of the facilities, processes and/or structures provided by the capital funds for this project:

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Waste handling and isolation facilities, Richland, Washington	2. Project No. 82-N-103
8. Brief physical description of project: (Cont'd)	

- a. All old single-shell waste tanks will be isolated from the active waste handling system. Piping will be disconnected and capped; and risers and ventilation systems will be sealed. This will prevent the inadvertent addition of liquids into the tanks after liquids have been removed during the stabilization effort.
- b. Sealing of single-shell auxiliary waste storage tanks, vaults, pits, related containment vessels, pumping equipment, dome risers, pit drains, etc., against unplanned addition of liquids by installation of at least one positive physical barrier to dome risers, water, steam, air, process lines, etc. If a structure cannot be secured by severing and sealing lines, a suitable closure capable of sealing and preventing unauthorized entry or removal will be installed. Methods of isolation will be designed to allow for access, if required, for future stabilization or retrieval efforts.
- c. Provision of surveillance instrumentation to monitor single-shell waste storage tanks for pressure, the presence of combustible gas, the measurement of solid and liquid contents and to indicate movement or structural degradation of waste storage tank walls and domes. Additional dry wells will also be provided on the tank periphery where required. Fixed and mobile instrumentation will be utilized to monitor and record the parameters for tank surveillance. A bench mark will be affixed to tank domes for survey measurement of dome differential. Thermocouple trees will be installed in the interior of larger high temperature single-shell tanks. A riser on each tank will be modified to allow connection of a portable exhaust system to preclude releases to the environment when a tank flange is removed for inspection of instrumentation.
- d. Upgrading of the 200 Areas cathodic protection system to protect the buried carbon and stainless steel pipelines and catch tanks against galvanic corrosion.
- e. Expansion of the Computerized Automatic Surveillance System (CASS) by connecting remote alarms to CASS substations. This will centralize surveillance for the 200 Areas in the 2750-E, Waste Management Surveillance and Operations Facility.
- f. Provide necessary transportable grout and support materials handling equipment to immobilize radioactive liquid waste.
- g. Provision of/or modification to existing facilities, processes and/or structures, for improved handling and stabilization of a variety of wastes which are either being concentrated and stored in existing Hanford facilities or currently exists in adjoining areas. Such efforts would minimize the amount of waste which must be stored and stabilized, thus reducing the potential for releases to the environment. Through a combination of process improvements and new processes, wastes would be fixed for burial or lower cost storage.

Title I and partial Title II design is being performed with prior year plant engineering and design (PE&D) funds. The FY 1985 appropriation is required to continue construction.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Waste handling and isolation facilities, Richland, Washington	2. Project No. 82-N-103
9. Purpose, justification of need for, and scope of project:	

Purpose: The removal of all freestanding liquid from the 149 old single shell tanks at Hanford was completed in November 1980. Removal of the remaining pumpable liquid is scheduled to be completed in FY 1989. The primary purpose of this project is to maintain the old single shell tanks in a safe, stable condition by providing for their long-term isolation, surveillance, and corrosion protection. In addition, the project includes a transportable grout facility to convert liquid low-level waste from N-Reactor operations to a form suitable for shallow land burial. This material is now placed in high-level waste tanks.

Justification: This isolation effort will place the single shell waste storage tanks, related auxiliary facilities, and systems in a mode which will minimize the intrusion of liquids into these systems, thereby preventing the migration of radioactive materials from these tanks and/or containments. The surveillance instrumentation will provide increased monitoring capability for large single shell waste storage tanks until the decision to leave or retrieve the stored waste is made.

Upgrading the 200 Areas cathodic protection system will provide protection against galvanic corrosion of buried pipelines, catch tanks and other equipment.

The transportable grout facility will convert approximately 500,000 gallons a year of liquid low-level waste from N-Reactor operations to a solid for shallow land burial. Considering the cost of high-level waste tanks where the waste is now placed, the subproject will have a payback of about two years. In addition, subject to the NEPA process, it may be that the contents of several existing high-level waste tanks are reclassifiable to low-level waste and, therefore, could be processed through the grout facility, freeing up additional space for high-level waste operations at Hanford.

Scope: This project will provide such items as: (a) the facilities for the isolation of Hanford waste storage tank farms, (b) additional surveillance instrumentation for single shell waste storage tanks and related systems, (c) additional protection for buried pipelines and single shell catch tanks against galvanic corrosion, and (d) portable grout facility to process liquid low-level waste from N-Reactor operations.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Waste handling and isolation facilities, Richland, Washington

2. Project No. 82-N-103

10. Details of cost estimate^{a/}:

	<u>Item Cost</u>	<u>Total Cost</u>
a. Title II design services at 7% of construction costs, item c		\$ 1,700
b. Title III services at 8% of construction costs, item c		1,900
c. Construction costs		24,650
(1) Construction will include modification of existing risers to incorporate a valve assembly that connects to breathing filters on the isolated tanks	\$ 500	
(2) Special facilities including specialized pumps, piping, instrumentation, filter systems, job cranes, dry wells, caissons, and barriers	24,150	
Subtotal		28,250
d. Contingency @ approximately 22% of above costs		6,200
Total Project Cost		<u>\$ 34,450</u>

11. Method of performance:

Title II design services will be performed by a negotiated architect/engineer contract. Title III services will be accomplished by the Cost-Plus-Award-Fee (CPAF) architect/engineering contractor. Construction and procurement will be accomplished by the onsite CPAF construction services contractor or fixed-price contracts and subcontracts awarded competitively.

12. Schedule of project funding and other related funding requirements:

	<u>Prior yrs.</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>Complete</u>	<u>Total</u>
a. Total project costs							
1. Total facility costs							
(a) Construction line item	\$ 826	\$ 4,528	\$10,502	\$ 8,500	\$ 4,600	\$ 5,494	\$34,450
(b) PE&D	1,550	0	0	0	0	0	1,550
Total facility costs	2,376	4,528	10,502	8,500	4,600	5,494	36,000

a/ Based on 70% complete conceptual design and recent construction costs of similar projects.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Waste handling and isolation facilities, Richland, Washington

2. Project No. 82-N-103

12. Schedule of project funding and other related funding requirements: (Cont'd.)

	<u>Prior yrs.</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>Complete</u>	<u>Total</u>
2. Other project costs							
(a) R&D necessary to complete construction	800	0	0	0	0	0	800
(b) Other project related cost ..	350	300	250	150	50	200	1,300
Total other project funding	<u>1,150</u>	<u>300</u>	<u>250</u>	<u>150</u>	<u>50</u>	<u>200</u>	<u>2,100</u>
 Total project costs (item 1 & item 2)	 <u>\$ 3,526</u>	 <u>\$ 4,828</u>	 <u>\$10,752</u>	 <u>\$ 8,650</u>	 <u>\$ 4,650</u>	 <u>\$ 5,694</u>	 <u>\$38,100</u>
 b. Other related annual costs							
1. Annual facility operating cost							\$ 600
2. Programmatic operating expenses directly related to the facility							2,700
3. Capital equipment not related to construction but related to the operating effort in the facility .							<u>100</u>
 Total other related annual costs							<u>\$ 3,400</u>

13. Narrative explanation of total project funding and other related funding requirements

a. Total project funding

1. Other project funding

(a) R&D necessary to complete construction

The estimated conceptual design cost for this project is \$950,000.

(b) Other project related costs

These costs are associated with project support and management activities.

b. Total related funding requirements

1. Annual facility operating costs

These costs include manpower, energy, maintenance and shop supplies for operation of facilities and processes.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Waste handling and isolation facilities, Richland, Washington 2. Project No. 82-N-103

13. Narrative explanation of total project funding and other related funding requirements: (Cont'd.)

2. Programmatic operating expenses directly related to the facility

These costs represent approximately one-half of the waste management operating costs for the Hanford waste management systems of which these facilities will be a part.

3. Capital equipment not related to construction but related to operating effort in the facility

These costs include a special purpose vehicle for transport of solidified waste.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

1. Title and location of project: Defense waste processing facility.
Savannah River, South Carolina

2. Project No. 81-T-105

3. Date A-E work initiated: 4th Qtr. FY 1979

5. Previous cost estimate: \$ 926,965
Less amount for PE&D: 16,965
Net cost estimate: \$ 910,000
Date: 12/82

3a. Date physical construction starts: 1st Qtr. FY 1984

6. Current cost estimate: \$ 886,965
Less amount for PE&D: 16,965
Net cost estimate: \$ 870,000 a/
Date: 12/83

4. Date construction ends: 3rd Qtr. FY 1989

7. Financial schedule:

	Fiscal year	Authorization	Appropriations	Obligations	Costs
639	1981 <u>b/</u>	10,000	0	0	0
	1982	20,000	20,000	20,000	12,655
	1983	30,000	40,000	40,000	35,582
	1984	142,000	142,000	142,000	108,103
	1985	238,000	238,000	238,000	177,000
	1986	260,000	260,000	260,000	230,000
	1987	130,000	130,000	130,000	200,000
	1988	40,000	40,000	40,000	90,000
	1989	-	-	-	16,660

a/ Reflects reduced escalation and contingency as well as additional scope that was originally planned for a subsequent line item project (Stage 2) and is now included in this project. Cost estimates for Stage 2 items are uncertain, therefore, TEC may require revision in the future.

b/ Funding was subsequently appropriated as PE&D.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Defense waste processing facility. 2. Project No. 81-T-105
Savannah River, South Carolina

8. Brief physical description of project:

The Defense Waste Processing Facility (DWPF) will solidify defense high-level radioactive waste at the Savannah River Plant (SRP) for temporary on-site storage, transportation to, and disposal in a federal repository. This project will provide facilities to immobilize the high-level waste in borosilicate glass in steel canisters. The canisters will be stored on the SRP site until a federal repository is available. The DWPF will be capable of immobilizing radioactive cesium in borosilicate glass for beneficial uses. Decontaminated salt will be solidified as a monolith with low permeability for disposal on-site as a low-level radioactive waste. The DWPF will begin operation in FY 1989 and will process the waste backlog inventory over approximately 15 years. The facility will be built near the H Chemical Separations Area and will include the waste processing facilities, waste storage vault, and power, service and other support facilities.

The main process building will be seismic and tornado resistant and will include remotely operated and maintained process cells containing process vessels and equipment which will be interconnected through systems of piping. The concrete walls will provide shielding against the highly radioactive waste solutions and solids. Cold feed chemicals and service systems, e.g., instrument connections, cooling water, steam, electrical power, etc., will be provided from adjacent areas behind the shielding walls to protect operating personnel. Ventilation air will be passed through a filter before final monitoring and discharge to the atmosphere. Also provided will be maintenance shops and areas, control rooms and similar service locations. New facilities and supporting services such as electrical substations, water wells, sanitary sewer systems, roads, shops and support facilities will be provided as needed.

This project will provide safe storage for the radioactive waste glass in canisters in a facility that requires minimum surveillance and attention. It is intended to store the immobilized waste on site until a Federal waste repository is available for disposal. The waste form and storage canisters will be compatible with transportation to, and storage in, a waste repository. If the waste repository is not available on a schedule to meet DWPF production output, additional storage capacity can be added. Studies are underway to determine the optimum canister storage alternative assuming a nominal ten year storage requirement.

9. Purpose, justification of need for, and scope of project:

Purpose: The Defense Waste Processing Facility (DWPF) will immobilize defense high-level radioactive waste at the Savannah River Plant (SRP) for disposal in a geologic repository.

Justification: Defense high-level radioactive waste results from processing irradiated reactor fuel at the Savannah River Plant to produce nuclear materials for national defense. Approximately 30 million gallons of high-level waste have accumulated from past production operations, and an additional five to ten million gallons will be generated through the year 2000. The waste is stored in large underground tanks which have a limited life and must be replaced periodically. This interim storage mode requires active maintenance, surveillance, and other operations to minimize releases of radioactive material to the environment. The DWPF will immobilize waste as a stable solid. This immobilization, and confinement in a

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Defense waste processing facility,
Savannah River, South Carolina

2. Project No. 81-T-105

9. Purpose, justification of need for, and scope of project: (cont'd)

geologic repository of the hazardous radionuclides, will ensure the long-term isolation of the waste from the environment with minimal maintenance and surveillance.

The DWPF will provide immobilized defense high-level waste for experiments in the WIPP in 1990. No other source of immobilized defense high-level waste will be available then.

Scope: This project will provide facilities which will perform the following operations:

- a. Transfer the treated high-level waste from waste storage tanks to feed tanks in the main processing building.
- b. Process the waste to produce canisters of waste immobilized in borosilicate glass.
- c. Store the filled containers on site pending transfer to a waste repository.
- d. Solidify decontaminated salt for on-site disposal as low-level waste.

The FY 1985 funding is required to continue design and construction to maintain the project schedule for completion by June 1989, and to maintain the total estimated cost of \$870 million. In FY 1985 final design will continue to approximately 80% complete. Construction of the main process buildings and support facilities will continue and additional major procurements will be made for essential construction materials and equipment.

10. Details of cost estimate:

	Item Cost	Total Cost
a. Engineering, design and inspection		\$ 192,000
(1) Engineering and design at 27% of construction costs (item b)	\$ 150,000	
(2) Engineering control and inspection at 8% of construction costs (item b)	42,000	
b. Construction costs.....		550,000
(1) Improvements to land.....	11,000	
(2) Buildings.....	169,000	
(3) Other structures such as fan house, exhaust stack and sand filter.....	25,000	
(4) Special facilities such as piping processing equipment, mechanical systems and services.....	313,000	
(5) ADP equipment.....	2,000	
(6) Utilities.....	30,000	
c. Standard equipment.....		18,000
Subtotal.....		760,000
d. Contingency @ approximately 14% of above costs.....		110,000
Total Project Cost.....		<u>\$ 870,000</u>

11. Method of performance:

Independent contractors will be used for selected tasks under the supervision of the operating contractor.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Defense waste processing facility,
Savannah River, South Carolina

2. Project No. 81-T-105

12. Funding schedule of project funding and other related funding requirements:

	Prior Years	FY 1984	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	Total
a. Total project funding								
1. Total facility costs								
(a) Const. line item.	\$48,237	\$108,103	\$177,000	\$230,000	\$200,000	\$ 90,000	\$ 16,660	\$ 870,000
(b) PE&D.....	16,965	0	0	0	0	0	0	16,965
Total fac. costs	65,202	108,103	177,000	230,000	200,000	90,000	16,660	886,965
2. Other project funding								
(a) R&D.....	91,886	10,164	9,585	9,366	10,031	9,197	8,455	148,684
DWPF Tech Support	2,085	12,290	11,430	15,482	17,654	20,165	19,414	98,520
(b) Other proj. related costs....	37,523	10,200	14,700	12,320	12,826	9,450	3,514	100,533
Total other proj. funding..	131,494	32,654	35,715	37,168	40,511	38,812	31,383	347,737
Total proj. funding (1&2)	\$196,696	\$140,757	\$212,715	\$267,168	\$240,511	\$128,812	\$ 48,043	\$1,234,702

b. Other related annual costs (estimated programmatic use of facilities: 30 years).

1. Annual facility operating costs (including decontaminated salt disposal).....	\$ 74,000
2. Capital equipment not related to construction but related to programmatic effort in the facility.....	6,000
Total other related annual funding requirements (1989 dollars).....	\$ 80,000

13. Narrative explanation of total project funding and other related funding requirements:

a. Total project funding

1. Other project funding

(a) R&D

These funds are required for optimization studies, completion of R&D support for demonstration of the process, technical interface with transportation and repository systems, and waste form optimization and characterization.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Defense waste processing facility,
Savannah River, South Carolina

2. Project No. 81-T-105

13. Narrative explanation of total project funding and other related funding requirements: (cont'd)

DWPF Technical Support

These funds will provide technical support to design and construction during demonstration of equipment plus testing and run-in of DWPF equipment prior to in-plant installation.

(b) Other project related costs

Funds are for engineering studies, plant liaison costs for drawing review, and coordination of development data and design, and construction checking.

Additional funds associated with activities such as preparation of procedures, training of operating personnel, procurement of supplies, and system checking will be requested from the operations budget in years after 1985.

b. Other related annual costs

1. Annual facility operating costs

Includes labor, overhead, utilities and services, process technical support, cold feed chemicals, canister materials, and miscellaneous supplies.

2. Capital equipment not related to construction but related to programmatic effort in the facility

Includes estimated replacement costs for melter, vessels, pumps, motors, etc.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEET
Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

1. Title and location of project: Waste isolation pilot plant, Delaware Basin, Southeast, New Mexico 2. Project No. 77-13-f
3. Date A-E work initiated: 2nd Qtr. FY 1978 5. Previous cost estimate: \$504,000
Date: 5/82
- 3a. Date physical construction starts: Exploratory construction - 3rd Qtr. FY 1981
Facility construction - 3rd Qtr. FY 1983 6. Current cost estimate: \$459,000 a/
Date: 9/83
4. Date construction ends: 1st Qtr. FY 1987c/

7. Financial schedule

Fiscal year	Authorization	Appropriations	Obligations	Costs
1977	\$ 6,000	\$ 6,000	\$ 916	\$ 854
1978	22,000	22,000	11,799	4,122
1979	40,000	18,000 ^{b/}	28,933	32,607
1980	22,000	22,000	17,255	17,835
1981	29,000	15,000	23,969	20,881
1982	38,600	40,000	40,003	31,415
1983	76,200	110,800	75,749	44,652
1984	109,700	109,300	144,476	82,127
1985	60,700	61,100	61,100	119,800
1986	54,800	54,800	54,800	89,707
1987	0	0	0	15,000
1988	0	0	0	0

a/ Estimated cost based on anticipated cost reduction program. A new baseline will be established in FY 1984 upon completion of Title-II design. Additional cost reductions may be achieved.

b/ Includes \$8,000,000 reprogramming action.

c/ Improved construction schedule identified in December 1983. Does not affect operational date.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Waste isolation pilot plant, Delaware Basin, Southeast, New Mexico

2. Project No. 77-13-f

8. Brief physical description of project:

The Waste Isolation Pilot Plant (WIPP), in Eddy County about 25 miles east of Carlsbad, New Mexico, will be a research and development facility to demonstrate the safe disposal of radioactive wastes from defense activities and programs of the United States exempted from regulation by the Nuclear Regulatory Commission. As provided in the Record of Decision, construction of surface and underground facilities is proceeding on a phased basis consistent with the evaluation of data obtained during the exploratory Site and Preliminary Design Validation Program (SPDV). SPDV was an exploration program designed to validate site suitability, and to confirm preliminary geotechnical design parameters, and was completed in March 1983.

Land, Oil, Gas, and Mineral Rights

The Waste Isolation Pilot Plant is comprised of a one-square mile principal site, surrounded by a 13-square mile control zone. All federal and state lands including surface and subsurface (oil, gas, water, and minerals) resources within safe boundaries must be acquired to protect the site. However, safe access to all resources will be available with present extraction technology. Partial control over federal lands has been transferred administratively from the Department of the Interior to the DOE. More permanent withdrawal from the public domain by specific legislation will be required prior to emplacing radioactive waste. Outstanding mineral and hydrocarbon leases will be purchased from the leaseholder if necessary. State lands totaling 1,740 acres will be traded for federal land of equal value.

9. Purpose, justification of need for, and scope of project:

Purpose: This project is necessary to demonstrate for the first time the long-term storage of defense-generated radioactive waste in a geologic environment on a credible scale. It will demonstrate safe routine handling of radioactive wastes in the quantities in which they are generated. Alternatives will not be available for many years.

Justification: Radioactive waste disposal has been under development by the Department of Energy and its predecessor agencies for decades. Some radioactive wastes require isolation from the biosphere for hundreds of thousands of years. Salt deposits such as those found at the WIPP site have been isolated from circulating ground water (and thus from the biosphere) for hundreds of millions of years. From an extensive site characterization and validation program, there is reasonable assurance that this isolation will continue. Radioactive waste placed in the WIPP salt beds can be expected to remain permanently isolated from the environment. The WIPP site has been exhaustively studied to ensure a high confidence in site suitability. A statement on the site's suitability was formalized in July 1983.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Waste isolation pilot plant, Delaware Basin, Southeast,
New Mexico

2. Project No. 77-13-f

9. Purpose, justification of need for, and scope of project: (cont'd)

Scope: The WIPP facility will include permanent structures on the surface for waste handling, administration, operations, security, maintenance, and other support. There will be approximately fifteen miles of access roads and six miles of railroad. Also included are site work, paving, fencing, and utilities. There will be one storage horizon located approximately 2,149 feet below the surface in the lower segment of the Salado (bedded salt) formation. Three shafts (waste, ventilation, and construction exhaust and salt handling) will connect the surface facilities to the storage horizon. Approximately 1,500,000 tons of salt excavation will be required to permit the initial receipt of wastes and experiments.

The waste handling facility will have the capability to handle annually up to 500,000 cubic feet of contact-handled waste and 400 containers of remote-handled waste on a single shift basis. Approximately 40-60 canisters (total) of experimental HLW will be emplaced and later removed after the experimental period. The full design capability of the WIPP for TRU waste will be utilized when sufficient operating and scientific data have been evaluated to assure the safety of short and long term disposal operations. The waste handling facility will include three major functional areas: a contact-handled waste area, a remote-handled waste area, and the waste hoist tower. The contact-handled waste area includes facilities for receiving and handling, pallet loading and overpack and repair. The remote-handled waste area includes facilities for cask receiving, preparation, and decontamination and a hot cell for canister removal, as well as appropriate transfer stations and airlocks. Both the contact-handled and remote-handled areas share the shaft for transport of the waste underground. Associated administrative, laboratory, change rooms, utility and electrical equipment areas adjoin the main facility.

The project includes offices and facilities for security, fire safety, plant safety, first-aid, inventory, health physics, monitoring, data processing, and control rooms. These facilities will be located in the support area of the Waste Handling and Support Building. Other support facilities include hoist houses, exhaust filtering, salt handling, emergency power, and warehousing. Land improvements will include clearing and grading, roads, parking areas, and fencing. This remote site also requires road and rail access, water, and telephone connections, etc.

10. Details of cost estimate:

A comprehensive preliminary design (Title I) review of the WIPP project was conducted in June 1979. A total estimated cost (TEC) of \$440,500,000 was established and approved in September 1979. This estimate was based upon completing construction in CY 1984. Since that time, numerous delays have been experienced: Title II was not started until February 1981 and will be completed in FY 1984. Scheduled construction completion was slipped to 1987, and the scope of the project has been modified to exclude commercial spent fuel and to include the now completed exploratory program (the SPDV). A revised TEC of \$651.7 million was reviewed and validated in December 1981. The total project cost (TPC) was \$948 million. The increase from the previous estimate resulted almost exclusively from delay and escalation. A cost reduction program in 1982 identified savings of \$200 million, establishing a TEC of \$504 million and a TPC of \$748 million. Continuing attention to cost reduction efforts through FY 1982 and FY 1983 resulted in identifying additional potential savings of approximately \$55 million. The associated TPC is \$693 million. This estimate will be reviewed and validated upon completion of Title-II design.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Waste isolation pilot plant, Delaware Basin, Southeast,
New Mexico

2. Project No. 77-13-f

10. Details of cost estimate: (cont'd.)

	ITEM COST	TOTAL COST
A. Engineering, Design and Inspection (Bechtel, TSC, DOE)		\$ 155,196
(1) Engineering and design at 30% of construction costs (item b)	\$ 72,234	
(2) Engineering control and inspection at 34% of construction costs (item b) (DOE & TSC)	82,962	
B. Construction Costs		243,415
(1) Improvements to land (CCP 03, 05, 22) plus leaseholders	47,029	
(2) Buildings (CCP 08, 14, 19)	80,318	
(3) Other structures such as tanks, railroad, hoist	11,250	
(4) Special facilities such as U/G excav., CMCS, shafts	81,190	
(5) SNL, GFE	4,194	
(6) Utilities (CCP 07, 09, 10 SW Pub.)	19,434	
C. Prototype Equipment		8,503
	SUBTOTAL	407,114
D. Contingency @ Approximately 20.5% of Remaining Costs - (FY 1984 - FY 1988)		51,886
	TOTAL ESTIMATED COST	\$ 459,000

11. Method of performance:

Design is being accomplished by a cost-plus-fixed-fee A-E contract for Title II and Title III. Construction will be by fixed price contracts awarded competitively. If fixed price contracts cannot be awarded effectively, cost-plus-award-fee contracts will be employed. The technical support contractor will be responsible for procurement of certain material and equipment. Site acquisition will be accomplished through the withdrawal of federal lands from the public domain. The U.S. Army Corps of Engineers has been assigned responsibility, under DOE Project Office direction, for construction management and direction of construction contractors.

12. Funding schedule of project funding and other related funding requirements

	Prior yrs.	FY 1984	FY 1985	FY 1986	FY 1987	FY 1988	Total
a. Total project costs							
1. Total facility costs							
(a) Construction line item <u>a/</u>	\$ 152,366	\$ 82,127	\$ 119,800	\$ 89,707	\$ 15,000	\$ 0	\$ 459,000

a/ This cost includes leasehold acquisition costs.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Waste isolation pilot plant, Delaware Basin, Southeast,
New Mexico

2. Project No. 77-13-f

12. Funding schedule of project funding and other related funding requirements: (cont'd.)

	<u>Prior yrs.</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>Total</u>
2. Other project costs							
(a) R&D (conceptual design, site evaluation)	66,046	31,854	25,800	25,400	40,200	40,300	229,600
(b) Other project related costs (capital equipment)	\$ 1,857	\$ 743	\$ 600	\$ 600	\$ 600	\$ 0	\$ 4,400
Total other project funding.	<u>72,100</u>	<u>32,597</u>	<u>26,400</u>	<u>26,000</u>	<u>40,800</u>	<u>40,300</u>	<u>234,000</u>
Total project costs (item 1 and item 2)	<u>\$ 220,269</u>	<u>\$114,724</u>	<u>\$146,200</u>	<u>\$115,707</u>	<u>\$ 55,800</u>	<u>\$ 40,300</u>	<u>\$ 693,000</u>

b. Total related funding requirements (estimated life of project: 25 years)

1. Annual facility operating costs (1983 dollars) \$ 22,000

13. Narrative explanation of total project funding and other related funding requirements

a. Total project costs

2. Other project costs

(a) R&D necessary to confirm site suitability and complete construction

These funds are (1) R&D directly supporting design, construction and future operations, and (2) validation of site suitability, including underground exploration and measurements. They include support for USGS activities, and support to the State of New Mexico for independent environmental, health, and safety review.

(b) Other project related costs

These funds are for equipment requirements to support the R&D program

b. Total related funding requirements

1. Facility operating costs

These costs represent the project annual operating cost for the facility.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
OPERATING EXPENSE FUNDED PROJECT DATA SHEET

Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

Total Estimated Cost (TEC) \$20,900,000
(For Design and Construction)

Process Experimental Pilot Plant
Idaho Operations Office

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

OPERATING EXPENSE FUNDED PROJECT DATA SHEET

Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

Process Experimental Pilot Plant (PREPP)
Idaho Operations Office (ID)

Total Estimated Cost (TEC) \$20,900,000
(For Design and Construction)

	Cumulative Prior Years		FY 1983 Actual		FY 1984 Estimate		FY 1985 Estimate		FY 1986 Estimate		Total
	B/A	B/O	B/A	B/O	B/A	B/O	B/A	B/O	B/A	B/O	
<u>Operating Expenses:</u>											
Design and Construction	\$1,100	\$ 600	\$4,100	\$4,203	\$4,300	\$3,100	\$11,400	\$7,100	\$ 0	\$5,897	\$20,900
R&D Related to Construction	500	500	1,700	1,700	2,400	1,900	1,900	1,900	1,200	1,700	7,700
Facility Operations	0	0	0	0	0	0	0	0	0	0	0
Direct Project Related Support Costs	0	0	0	0	0	0	0	0	900	900	900
Total Project Funding	<u>\$1,600</u>	<u>\$1,100</u>	<u>\$5,800</u>	<u>\$5,903</u>	<u>\$6,700</u>	<u>\$5,000</u>	<u>\$13,300</u>	<u>\$9,000</u>	<u>\$2,100</u>	<u>\$8,497</u>	<u>\$29,500</u>

Description, Objective, and Justification:

The PREPP will operate as an experimental pilot plant at the Idaho National Engineering Laboratory (INEL) to obtain design and operational data for full-scale processing of transuranic (TRU) waste. The PREPP will include several unit processes (experimental equipment) which will demonstrate different experimental approaches to processing TRU waste. The initial experiments conducted in the PREPP will process selected retrievably stored INEL TRU waste which cannot be certified for direct shipment to the Waste Isolation Pilot Plant (WIPP). This waste will consist of shreddable solid wastes and sludges contained in 30, 55, and 83-gallon steel drums; 4 x 4 x 7-foot wooden boxes; and 4 x 5 x 6-foot steel bins. Containers suspected of containing large unshreddable items, hazardous materials, nonradiological toxic chemicals, large quantities of lead, highly radioactive material, and lead-lined drums will not be processed, but will continue to be stored at the INEL Radioactive Waste Management Complex (RWMC).

The PREPP will process the selected stored TRU waste material through a low-speed shredder and rotary kiln incinerator. The incinerator discharge material will be immobilized by concreting. Any items which are incompatible with the process or will not fit into the end product container will be repackaged and returned to the RWMC for interim storage. The PREPP will be designed to test processing of the selected TRU stored waste at a nominal rate of seven tons per day. All auxiliary equipment will be sized to support this nominal process rate. The PREPP will also provide space for opening waste containers to verify the adequacy of the waste certification procedures being performed at the Stored Waste Examination Pilot Plant (SWEPP).

Process Experimental Pilot Plant (PREPP)
Idaho Operations Office (ID)

Total Estimated Cost (TEC) \$20,900,000

Description, Objective, and Justification: (cont'd.)

The primary objective of the PREPP is to demonstrate, through experiments, the viability of full-scale methods for processing transuranic (TRU) waste into a form acceptable for disposal at the WIPP. The TRU waste put into retrievable storage early in the program has passed the half way mark of its 20-year design life. There is a fast approaching need to develop technologies to treat this waste for permanent disposal. The PREPP experiments will develop the needed technologies.

a. Schedule of Planned Activities:

	<u>Start</u>	<u>Complete</u>
Engineering Design (Title I and II)	4Q FY 1982	4Q FY 1983
Procurement	2Q FY 1983	2Q FY 1985
Construction and Installation	3Q FY 1983	3Q FY 1986
Check-out and Start-up	3Q FY 1986	4Q FY 1986

b. Management and Contracting:

ID will be responsible for the design and construction of the PREPP with the support of appropriate contractors. ID approval will be required for the preliminary design, the final design, and initiation of procurement of long-lead items. The design is being performed through an Architect-Engineering contract. Construction will be managed under the INEL site construction management contract. Operation of the facility will be the responsibility of the prime INEL operating contractor, EG&G Idaho, Inc.

c. Prior Year Achievements:

During FY 1983, final Title II design will be completed. Procurement of long-lead equipment will be initiated. Demolition and foundation construction will be initiated. Construction and long lead procurement will continue during FY 1984.

d. Current Year Achievements:

During FY 1985 construction and installation of process equipment will continue.

e. Reasons for Increases and Decreases:

Not applicable.

Process Experimental Pilot Plant (PREPP)
Idaho Operations Office (ID)

Total Estimated Cost (TEC) \$20,900,000

Description, Objective, and Justification: (cont'd.)

f. Cost Estimate:

The costs shown are based upon the completed Title I design. The funding outlined in this schedule is limited to the actual design, construction, installation, and check-out periods for PREPP. The Total Estimated Cost (TEC) for the PREPP is as follows:

	<u>Item Cost</u>	<u>Total Cost</u>
1. Engineering, Design, Inspection, and Project Management at 35% of Construction Cost.		\$ 4,600
2. Construction and Installation Costs		\$ 13,300
(a) Improvements to land	\$ 0	
(b) Buildings and structures	3,000	
(c) Process equipment	6,000	
(d) Utilities	4,000	
(e) Demolition and removal	300	
Subtotal		\$ 17,900
3. Contingency at approximately 17% of above costs		\$ 3,000
Total Estimated Cost		\$ 20,900

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

OPERATING EXPENSE FUNDED PROJECT DATA SHEET

Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

Total Estimated Cost (TEC) \$9,500
(For Design and Construction)

Canister Fabrication Demonstration Activity (CFDA)
Idaho Operations Office

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

OPERATING EXPENSE FUNDED PROJECT DATA SHEET

Atomic Energy Defense Activities
Defense Waste and Byproducts Management

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

Canister Fabrication Demonstration Activity (CFDA)

Idaho Operations Office

Total Estimated Cost (TEC)

(For Design and Construction)

\$9,500

	Cumulative Prior Years		FY-1984 Estimate		FY-1985 Estimate		FY-1986 Estimate		Beyond FY-1986 Estimate		
	B/A	B/O	B/A	B/O	B/A	B/O	B/A	B/O	B/A	B/O	Total
<u>Operating Expenses:</u>											
Design and Construction ^{a/}	\$ 0	\$ 0	\$ 500	\$ 500	\$ 2950	\$ 2950	\$ 6050	\$ 5050	\$ 0	\$ 1000	\$ 9500
R&D Related to Construction	274	242	1140	1172	0	0	0	0	0	0	1414
Facility Operations	0	0	0	0	0	0	0	0	0	0	0
Direct Proj. Rel. Support Cost ^{b/}	0	0	0	0	500	500	620	620	2860	2860	3980
Capital Equipment	0	0	0	0	0	0	0	0	0	0	0
Total Project Funding	\$274	\$242	\$1640	\$1672	\$ 3450	\$ 3450	\$ 6670	\$ 5670	\$ 2860	\$ 2860	\$ 14894

656

^{a/} Projected funding for each fiscal year is in escalated dollars.

^{b/} Projected funding for FY-1986 and beyond is in constant FY-1985 dollars.

Description, Objective and Justification:

The Canister Fabrication Demonstration Activity (CFDA) task covers preparation of design and facility modifications at the Waste Experimental Reduction Facility (WERF) site, procurement and installation of process equipment, and training and utilization of personnel to demonstrate the capability to fabricate waste canisters from radioactively contaminated scrap steel.

The Defense Waste Processing Facility (DWPF) will immobilize high-level radioactive waste using borosilicate glass. The glass material is to be poured into a 10' x 2' stainless steel canister which will contain and store the waste. A preliminary evaluation has indicated that such canisters can be fabricated from recycled radioactively contaminated steel at a cost competitive with canister fabrication from uncontaminated steel, since large accumulations of contaminated steel are available for the cost of transportation to WERF.

Operating Expense Funded Project Data Sheet

Canister Fabrication Demonstration Activity (CFDA)

Idaho Operations Office (ID)

Total Estimated Cost (TEC): 9500

(For Design and Construction)

Description, Objective and Justification: (Cont'd.)

By modifications at the WERF site (which now has capability for sizing and melting contaminated steel), processes can be installed to melt contaminated steel, alloy the steel, centrifugally cast the cylindrical portion of the canister, weld commercially fabricated end pieces to the cylinder, and machine finish and nondestructively test the canister. Initially only the building will be constructed and enough equipment procured and installed in the building to prove the practicability of the project. If the proof of practicality (POP) tests are positive, additional equipment will be procured to make this an operational facility.

By recycling contaminated steels, the need to utilize uncontaminated steel for canisters can be greatly reduced; and contaminated steel that would otherwise be buried as radioactively contaminated waste can be reused. This will reduce the total volume of low-level waste that must be buried at a radioactive waste disposal site, and will reduce the use of uncontaminated strategic materials such as chromium and nickel that would otherwise be required in the fabrication of uncontaminated canisters used for disposal of this waste.

a. Schedule of Planned Activities:

	<u>Start</u>	<u>Complete</u>
WERF Support Test	1Q FY 1984	3Q FY 1984
POP Engineering Design	4Q FY 1984	3Q FY 1985
POP Procurement	2Q FY 1985	2Q FY 1986
POP Construction and Installation	4Q FY 1985	4Q FY 1986
POP Procedures and Operating Manuals	2Q FY 1986	2Q FY 1987
POP Testing and Checkout	1Q FY 1987	2Q FY 1988

b. Management and Contracting:

Idaho will be responsible for the design and construction of the CFDA with the support of appropriate contractors. DOE-ID approval will be required for the preliminary design, the final design, and initiation of procurement of long-lead items. It is anticipated that design will be performed by EG&G Idaho, Inc. utilizing an engineering service contract with a commercial company which routinely manufactures centrifugal castings. Construction will be managed under the Idaho National Engineering Laboratory site construction management contract. Operation of the facility will be the responsibility of the prime INEL operating contractor, EG&G Idaho, Inc.

Operating Expense Funded Project Data Sheet

Canister Fabrication Demonstration Activity (CFDA)
Idaho Operations Office (ID)

Total Estimated Cost (TEC): 9500
(For Design and Construction)

Description, Objective, and Justification: (Cont'd.)

c. Prior Year Achievements:

During FY 1982, the project feasibility study was completed and presented to DWPF, DOE-SR, and DOE Headquarters personnel. All parties recommended advancement of the project to the conceptual design phase.

During FY 1983, the conceptual design was completed and discussed with DWPF, DOE-SR and DOE Headquarters personnel.

During FY 1984, an updated conceptual design report will be completed, along with feasibility tests at SR. Test results and the report will be discussed with DWPF, DOE-SR and DOE-HQ, and a decision will be made whether or not to proceed with the demonstration.

d. Current Year Achievements:

In FY 1985, (assuming the decision is made to proceed) Title I and Title II design will be completed, equipment procurement will be initiated, and the building extension construction will begin.

e. Reasons for Increases and Decreases:

None--Not applicable.

f. Cost Estimate:

The costs shown are based upon 100% conceptual design stage estimates. The funding outlined in this schedule is limited to the actual design, facility construction, equipment installation, process checkouts, and fabricated canister testing. The total estimated cost (TEC) for the project is as follows:

Operating Expense Funded Project Data Sheet

Canister Fabrication Demonstration Activity (CFDA)

Idaho Operations Office (ID)

Description, Objective, and Justification: (Cont'd.)

Total Estimated Cost (TEC): 9500
(For Design and Construction)

<u>Project Tasks</u>	<u>Item Cost</u>	<u>Total Cost</u>
Engineering, Design, Inspection, and Project Management		\$2,080
Construction and Installation Costs		5,220
(1) Improvements to Land	\$ 50	
(2) Buildings and Structures	1,650	
(3) Process Equipment	3,470	
(4) Utilities	50	
(5) Demolition and Removal	0	
Subtotal		<u>7,300</u>
Contingency at approximately 30% of above costs		<u>2,200</u>
Total Estimated Cost		\$9,500

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DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

LEAD TABLE

NUCLEAR SAFEGUARDS AND SECURITY
Atomic Energy Defense Activities

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

	<u>FY 1983</u> <u>Appropriation</u>	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Base</u>	<u>FY 1985</u> <u>Request</u>
Nuclear Safeguards and Security (DP)				
Operating Expenses				
Program Resources.....	\$36,535	\$41,650	\$41,650	\$50,400
Program Direction.....	6,625	6,350	6,544	7,600
Total Operating Expenses.....	<u>43,160</u>	<u>48,000</u>	<u>48,194</u>	<u>58,000</u>
Capital Equipment.....	3,700	4,000	4,000	4,700
Construction.....	<u>500</u>	<u>-</u>	<u>-</u>	<u>-</u>
Nuclear Safeguards and Security.....	\$47,360	\$52,000	\$52,194	\$62,700
Total FTE's.....	193	200	199	199

Authorization: Section 1, P.L. 83-703

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
 Nuclear Safeguards and Security
 (In thousands of dollars)

FY 1984 Appropriation Enacted.....	\$52,000
Built in Increases and Decreases:	
Pay Raise Requirement.....	<u>194</u>
FY 1985 Base.....	\$52,194
Program Increases and Decreases:	
Escalation for Operating Expenses - Program Resources, and Capital Equipment.....	+2,284
Increase for Safeguards and Security Operations includes: operation of the DOE Safeguards and Security Training Academy, limited additional direct support in security operations; and additional efforts in field assistance design/development sup- port for an increasing number of approved safeguards and security projects.....	+5,698
Increase for Technology provides for development of physical protection systems and technologies fully integrable with MC&A systems, and enhanced intrusion detection and MC&A methodology...	+655
Decrease in the International program limits it to continuation of highest priority international activities.....	- 79
Increase for Classification provides for technical support activities.....	+392
Increase in Capital Equipment provides equipment for safeguards operations and classification program.....	+500
Increase in Program Direction permits level of staffing identified for the Office of Safeguards and Security and the Office of Classification.....	<u>+1,056</u>
FY 1985 Budget Request.....	\$62,700

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
Nuclear Safeguards and Security

Program Overview

The Nuclear Safeguards and Security Program is responsible for developing measures to assure adequate protection of DOE's nuclear weapons, nuclear materials, facilities, and classified information against theft and sabotage. The program also focuses on providing safeguards technical support to U.S. and international activities designed to minimize the proliferation of nuclear weapons. As part of this program, the classification activity is responsible for implementing the DOE's classification and declassification activities.

Recent accomplishments include the issuance of a revised threat statement which established performance goals against a range of potential adversaries. Validation of physical fitness standards for guards was also completed. Training and testing to bring the entire DOE protective force in compliance with these standards started during calendar year 1983. The upgrading of our facilities is continuing under the Safeguards and Security Improvement Program. In addition, activities are underway to, support site-specific safeguards and security improvements; reestablish airspace restrictions at critical DOE facilities; establish a centralized training facility for protective force personnel; and to systematically evaluate the significance of safeguards and security weaknesses. Cooperative efforts are underway to obtain timely backup for incident response.

Program objectives will emphasize improved effectiveness of safeguards and security through intensified guard forces training; improved personnel access control; evaluation of existing systems to meet site-specific needs; and assistance in implementation of safeguards improvements. Efforts will continue in support of classification activities, development of international safeguards, training of foreign safeguards personnel, tracking of nuclear materials shipments, and development of technology in physical protection and material control and accounting.

Conduct of these activities will help meet the objectives of pertinent public laws and treaties/agreements and provide for better protection of DOE's nuclear weapons, nuclear materials, facilities, and classified information.

Justification

The FY 1985 request for the Nuclear Safeguards and Security Program is \$62,700,000, an increase of \$10,700,000 over the FY 1984 appropriation. This provides \$58,800,000 for the Nuclear Safeguards and Security portion of the program and \$3,900,000 for the Classification portion of the program. The details of this budget increase are provided in the subsequent discussions of planned program efforts.

	FY 1984 <u>Appropriation</u>	FY 1985 <u>Request</u>
Operating Expenses - Program Resources.....	\$41,650	\$50,400
- Program Direction.....	6,350	7,600
Capital Equipment.....	4,000	4,700
	<u>\$52,000</u>	<u>\$62,700</u>

Operating Expenses - Program Resources

The FY 1985 request for program-related operating expenses is an increase of \$8,750,000 over the FY 1984 appropriation.

Safeguards and Security Operations

The FY 1985 operating expense request is \$32,410,000 for Safeguards and Security Operations, an increase of \$6,970,000 over the FY 1984 level of \$25,440,000. This increase provides for required field assistance to support activities underway to enhance the safeguards and security posture at critical DOE facilities. Those facilities require improvements to counteract sabotage and diversion threats by insiders; advanced access denial systems to prevent hands-on access to strategic material; and intrusion detection instrumentation to provide early warning detection capability. Improved computer security is also required to prevent access to classified and sensitive information. Increased inspection and evaluation activities will be implemented to review and to test improved systems relative to current threat guidance and to identify actions required to enhance the credibility of DOE-wide efforts to address Safeguards and Security concerns. Increased support is required for the DOE Safeguards and Security Training Academy to provide various tactical and other operational training of security forces. The following is a more detailed discussion of these items, as well as on-going program activities.

The budget request provides for improving the DOE's capability to protect classified information, weapons, facilities, and special nuclear materials. It includes technical assistance to field offices and DOE contractors for cost-effective application of safeguards and security technology and systems in support of programs involving existing and new facilities, and the conduct of training and workshops. It provides support to an effective Material Control and Accounting (MC&A) operation, including the Nuclear Materials Management and Safeguards System (NMMSS)--the National Data Base for information on accountable nuclear materials. It also provides New Brunswick Laboratory analytical services; and other developmental activities associated with field safeguards and security operations.

Information on adversary activities will be analyzed and distributed to program and field offices in order to aid in the identification of trends and patterns. Those facilities for which the combined threat, vulnerability, and consequences are potentially highest will be emphasized in order to better utilize resources. Oversight activities which involve periodic inspections and reviews of major DOE locations to evaluate safeguards and security programs will be strengthened and enhanced.

A major portion of the budget request is required to support emphasis on field implementation of safeguards and security, including upgrades through the Safeguards and Security Improvement Program. A major effort is required to assure that the technology developed to date in the Nuclear Safeguards and Security Program is transferred to the field and incorporated into these safeguards and security upgrades. The continued emphasis is to correct recognized vulnerabilities.

During FY 1985, major field assistance projects are planned to support significant physical protection and material control and accounting improvements at virtually all DOE facilities with attractive special nuclear materials (SNM) or vital operations. Consistent with recent threat guidance, the thrust of the physical protection projects is to provide effective protection against outside adversary intrusions and potential insider threats such as sabotage of vital facilities and components and the diversion of nuclear material. Based on documented and comprehensive vulnerability analyses, substantial effort is directed in FY 1985 toward implementing advanced access denial systems, state-of-the-art intrusion detection instrumentation, surveillance equipment, integrated site-wide security communications systems, and guard force response capabilities. Limited assistance will be provided to site-wide security improvements that are planned for national laboratories in FY 1985. Also, at the facility-specific level, physical protection improvements to counteract sabotage and diversion threats by insiders will be provided by the installation of personnel and material control and assessment systems at the production reactors and new material processing facilities.

Improvements in controlling and accounting for nuclear material to a level consistent with the recent threat guidance is also an objective of field assistance projects in FY 1985. This includes projects for obtaining quality measurements or controls on specific nuclear materials that are inherently difficult to measure or are entrained within processing equipment and are inaccessible for conventional measurement methods. Exemplary projects

addressing such problems are planned in FY 1985 at Idaho, Rocky Flats, and the Hanford complex. Field assistance in the implementation of advanced systems for material control and accounting is expected to provide effective protection by combining rapid measurement and data management with information from process control, and related physical protection subsystems. In FY 1985, advanced systems will be implemented in existing facilities at Los Alamos, Oak Ridge, Idaho and Richland and designs completed for new facilities under construction (or soon to become operational) at Savannah River, Oak Ridge, and Richland.

Other research and development activities provide field assistance in the areas of vulnerability identification and effectiveness evaluations, safeguards training and workshops, and the application of state-of-the-art measurement methods for nuclear materials accounting and field office inspection and quality assurance.

The New Brunswick Laboratory (NBL) serves as the U.S. government safeguards analytical laboratory to provide materials and services to DOE, NRC, and other government agencies, and foreign organizations in fulfilling safeguards requirements essential for the control and accounting of nuclear materials and related materials. This includes: (1) providing measurement services in support of Government audit and inspection requirements; (2) assessing and evaluating measurement technology in support of DOE fuel cycle and weapons production activities; (3) developing, certifying, and distributing reference materials for calibration and standardization of materials measurements; and (4) assisting in technology exchange and training in measurement technology.

The FY 1985 increase provides for improved computer security of automated operations. Also included will be development and refinement of a perimeter early warning detection system; establishment of threat assessment training; a research and development (R&D) program in technical surveillance; enhanced inspection and evaluation activities, and automation activities.

During FY 1985, the Office of Safeguards and Security (OSS) will continue to fund critical tasks aimed at improving the DOE's protective force capabilities. Consistent with these efforts we are requesting increased support for a DOE Safeguards and Security Training Academy to assure a high standard of readiness throughout DOE, and to enable a uniform approach to training in the tactical, legal, and technical aspects of physical security. The Multiple Integrated Laser Engagement System (MILES) will continue to be used as an aid in providing maximum realism in tactical training of guard forces.

OSS will continue to provide DOE field elements with timely intelligence information relative to the current and changing threats to the security posture of the Department. This effort will include (1) operational security vulnerability assessments to determine the potential for hostile intelligence collection against classified programs; (2) the development of advanced audio countersurveillance and suppression technology in support of Intelligence Community technical security operations; (3) continuation of developmental activities for improved protection of classified computer security operations in the DOE's computer systems and telecommunication system; (4) the transfer of improvements in technology in these areas to field operations; and (5) the development of security education and awareness training aids for field use.

OSS will continue to support the capability established in prior years to perform comprehensive technical and psychological threat credibility assessments. These communications analyses of actual threats by a team of highly skilled laboratory analysts serves as a national asset to the DOE's Emergency Action Coordination Team (EACT), the Federal Bureau of Investigation (FBI) and the Nuclear Regulatory Commission (NRC). This capability will also be utilized in support of other appropriate Federal, state and local law enforcement agencies through the FBI.

Technology

The FY 1985 operating expense request is \$11,250,000 for Technology. This is an increase of \$1,160,000 over the FY 1984 level of \$10,090,000. This increase provides for continuation of a base program to enhance intrusion and contraband detection, advanced access denial techniques, and materials control and accountability (MC&A) instrumentation for measurement and surveillance of strategic materials. These efforts include integrating physical protection systems and technologies with MC&A systems to address both the external and insider threats.

The total request provides for a base of technology to be used for safeguarding DOE and other U.S. nuclear facilities including a base level testing capability for new or modified commercial products (i.e., exterior sensors, interior sensors), and for determining and specifying assessment capabilities and strategies for response. It also includes the development and testing of new technology, components and systems for entry control, intrusion detection, explosives detection, use-denial, detection-surveillance assessment for airborne threats, and advances in security systems to determine effectiveness against new or changing threats. Tests and evaluations will be conducted on automated and hands-off components interfaced with computers to assay nuclear material for timely and accurate use of analytical measurement data for safeguards implementation. Emphasis will be placed on closing material balances on a more quantitative and timely basis. Field demonstrations will be conducted on techniques that can be used nondestructively and remotely and thus contribute to safe operations and provide efficient measurements for highly irradiated reprocessing dissolver solutions at Idaho, Richland, and Savannah River. A minimum level of support will be maintained for highly accurate calorimetric and gamma spectrometry measurements and for bulk materials measurements, standard reference materials and quality assurance programs; development and testing of new technology, components and systems for nuclear materials measurements, and accounting to determine effectiveness for expected new DOE processes and fuel cycle materials. Activities include vulnerability analyses, generic system design, integration of physical protection with materials control and accounting, assessment, and transportation safeguards.

International

The FY 1985 operating expense request is \$5,140,000 for International. This is an increase of \$170,000 above the FY 1984 level of \$4,970,000. This increase will permit continuation of the highest priority efforts in this area, with the primary objective to strengthen international safeguards in support of U.S. nonproliferation and national security. Substantial effort is directed at development of safeguards for application at the Portsmouth Gas Centrifuge Enrichment Plant (GCEP) under the December 1980 safeguards treaty agreement with the IAEA. This effort includes prototype and on-site testing of the selected safeguards equipment and system. Safeguards also will be developed for IAEA use at large nuclear fuel cycle facilities, including reprocessing, mixed-oxide fuel fabrication, and nuclear power plants using plutonium fuel. Training is provided for foreign safeguards personnel as directed by the Nuclear Nonproliferation Act of 1978.

Compliance with international agreements and the Atomic Energy Act of 1954, as amended, requires the tracking of both U.S. materials exported overseas and materials of foreign origin in the U.S. Funds are provided for the tracking of U.S. nuclear material in 50 countries, tracking and reporting to the IAEA under the U.S./IAEA Safeguards Treaty, and determining inventories of nuclear materials for Bilateral Agreements.

Classification

The FY 1985 operating expense request is \$1,600,000 for Classification. This is an increase of \$450,000 over the FY 1984 level of \$1,150,000. This increase provides for necessary additional technical analyses in support of classification guidance development in such areas as nuclear proliferation, verification technology on nuclear test detection, and computer codes. The total request provides for technical programmatic support activities (e.g., technical analyses in such areas as advanced isotope separation, safeguards, and vulnerability information); technical support for guide preparation, appraisals, and education; expanded document reviews, etc. In addition, efforts will continue on the establishment of an automated information retrieval system to provide for timely and consistent classification guidance, ready access to key precedent decisions, more efficient responses to the Congress and the public, and a comprehensive data base of public disclosures of classified information to properly assess privately generated nuclear weapon designs.

The objectives of this portion of the program are to establish and implement policy for the classification of Restricted Data, Formerly Restricted Data, and National Security Information within DOE's jurisdiction in accordance with the requirements of the Atomic Energy Act of 1954, as amended, and applicable Executive Orders. The program must also assure the continuous review of Restricted Data in order for the Assistant Secretary for

Defense Programs to determine what may be declassified and disseminated in the interest of scientific and technical programs and the general public welfare, without damage to the national security.

Specifically, the program (1) provides continuing guidance and oversight to Headquarters and field organizations on classification and declassification policies and procedures; (2) develops and updates classification guidance for nuclear weapons and other classified areas; (3) handles classification and declassification reviews, such as Freedom of Information Act requests and Mandatory Review requests pursuant to Executive Order 12356; and (4) performs appraisals of Headquarters, field office, and contractor classification functions.

Capital Equipment

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
Capital Equipment.....	\$4,000	\$4,700

The FY 1985 request for Capital Equipment is \$4,700,000, an increase of \$700,000 over the FY 1984 appropriation. Of the increase, \$300,000 will be used to provide equipment in support of continuing work on an automated information retrieval system in the Classification Program. The remaining \$400,000 will provide for replacement of a mass spectrometer at the New Brunswick Laboratory, and additional support for automation activities in the Nuclear Safeguards and Security program. Capital Equipment will be provided for: direct field support of DOE programs, operation of the Nuclear Materials Management and Safeguards System, operation of the New Brunswick Laboratory, nuclear material measurement and analysis for international and domestic safeguards, security countermeasures and computer security test and evaluation, and physical security for domestic safeguards.

Operating Expenses - Program Direction

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
Program Direction.....	\$6,350	\$7,600

The FY 1985 request is \$1,250,000 over the FY 1984 appropriation. The program direction funds provide for the salaries, benefits and travel expenses for 146 full-time equivalent positions associated with operational and management responsibilities of the safeguards and security and classification programs.

The safeguards and security staff is charged with the following major programmatic areas of responsibility.

- o Policy development and implementation, long-range planning, follow-up action on the resolution of identified site deficiencies, and resource management activities of the Office of Safeguards and Security.
- o Oversight assessment of the effectiveness and implementation of safeguards and security policy as it relates to the protection of nuclear-related DOE responsibilities and other designated DOE activities.
- o Operational aspects of personnel clearance procedures, actions and policy as well as the management of the DOE's personnel security clearance program involving the processing and analysis of approximately 31,100 security investigations per year.
- o Direction and coordination of Department-wide physical, technical, computer and operational security programs as well as document control and protective personnel programs.
- o Direction of the technology activities in physical protection and material control and accounting, for international safeguards, and for operational aspects of nuclear material control and accounting.

- o Management of the United States "Program of Technical Assistance to International Atomic Energy Agency Safeguards", a reimbursable work program funded at more than \$4,000,000 per year from Department of State appropriated funds.

The classification staff is charged with the following major areas of responsibility.

- o Technical direction and management of the Classification Program; development, issuance and monitoring of classification guides, bulletins, policies and procedures; classification reviews of documents and materials for the public (e.g., Freedom of Information Act and Mandatory Review Requests), other Department elements, other Federal agencies, and foreign governments; classification support for Congressional activities (testimony and review); development and implementation of a classification education program; and development and maintenance of data management systems on classification reviews, guides and authorized classifiers.

The nature of the activities supported in this budget do not lend themselves to the traditional cost-benefit analysis. However, activities are conducted in a manner to assure the most effective and efficient use of program resources.

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DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE

SECURITY INVESTIGATIONS
Atomic Energy Defense Activities

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

	<u>FY 1983</u> <u>Appropriation</u>	<u>FY 1984</u> <u>Appropriation</u>	<u>FY 1985</u> <u>Base</u>	<u>FY 1985</u> <u>Request</u>
Security Investigations (DP)				
Operating Expenses.....	<u>\$28,500</u>	<u>\$29,500</u>	<u>\$29,500</u>	<u>\$34,000</u>
Security Investigations.....	\$28,500	\$29,500	\$29,500	\$34,000
Total FTE's.....	N/A	N/A	N/A	N/A

Authorization: Section 145, P.L. 83-703

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
Security Investigations
(dollars in thousands)

FY 1984 Appropriation Enacted.....	\$29,500
Increase Number of Office of Personnel Management Full-Field Background Investigations by Approximately 3,830.....	<u>+4,500</u>
FY 1985 Budget Request.....	\$34,000

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
Security Investigations

Program Overview

The objective of the Security Investigations Program is to insure that the common defense and security of the United States will not be endangered, by the granting of security clearances to DOE and DOE contractor personnel who must, in the performance of their work, have access to Restricted Data, National Security Information or Special Nuclear Material, or who occupy a designated Critical Sensitive position.

Recent clearance support has been sufficient to provide for DOE and contractor needs. Approximately 31,130 security investigations will be performed in FY 1985, an increase of 3,830 investigations over FY 1984. It is anticipated that outlay program requirements for security investigations will increase slightly in future years.

Justification

The FY 1985 Request for the Security Investigations Program is \$34,000,000, an increase of \$4,500,000 over the FY 1984 appropriation. This amount will provide DOE with approximately 31,130 security investigations (20,630 full-field background investigations and 10,500 National Agency Checks). The estimated cost for a Federal Bureau of Investigation full-field background investigation is \$1,850, no change from FY 1984. The estimated cost of the Office of Personnel Management investigation is \$1,625, a decrease of \$125.00 from the FY 1984 estimate. The \$34,000,000 should adequately support projected FY 1985 requirements for all DOE and DOE contractor personnel requiring security clearances.

A tabulation of programmatic areas that are supported and the FY 1984 and FY 1985 funding levels follow:

	FY 1984		FY 1985	
	Cases	Amount	Cases	Amount
<u>Programs</u>				
Defense Program activities.....	19,137	\$20,428	22,525	\$23,203
Other DOE activities				
Uranium enrichment.....	5,272	5,899	5,770	6,551
Nuclear energy.....	1,067	1,015	1,182	2,076
Other.....	1,824	2,158	1,653	2,170
Total other DOE.....	<u>8 163</u>	<u>9,072</u>	<u>8,605</u>	<u>10,797</u>
Total.....	27,300	\$29,500	31,130	\$34,000

Below is a summary tabulation of security clearance requirements for FY 1984 and FY 1985 by type of clearance.

	FY 1984		FY 1985	
	Full Field	NAC	Full Field	NAC
<u>Programs</u>				
Defense Program activities.....	11,587	7,550	14,523	8,002
Other DOE activities				
Uranium enrichment.....	3,356	1,916	3,731	2,039
Nuclear energy.....	573	494	1,182	-
Other.....	1,184	640	1,194	459
Total other DOE.....	<u>5,113</u>	<u>3,050</u>	<u>6,107</u>	<u>2,498</u>
Total.....	16,700	10,600	20,630	10,500

The Atomic Energy Act of 1954, as amended, and Executive Orders 10450 and 10865 require that background investigations be conducted on all persons prior to being granted access to classified information, material, facilities or special nuclear material. Such investigations must be conducted by either the Federal Bureau of Investigation or the Office of Personnel Management.

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DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST
LEAD TABLE
NAVAL REACTORS DEVELOPMENT

ATOMIC ENERGY DEFENSE ACTIVITIES
(Tabular dollars in thousands. Narrative material in whole dollars.)

<u>Naval Reactors Development (NE)</u>	<u>FY 1983 Appropriation</u>	<u>FY 1984 Appropriation</u>	<u>FY 1985 Base</u>	<u>FY 1985 Request</u>
Plant Development				
Operating Expenses ..	58,000	59,000	59,000	63,900
Subtotal	58,000	59,000	59,000	63,900
Reactor Development				
Operating Expenses ..	157,150	188,300	188,300	229,300
Capital Equipment ...	11,000	20,000	20,000	22,500
Construction	78,000	103,000	103,000	48,000
Subtotal	246,150	311,300	311,300	299,800
Reactor Operation and Evaluation				
Operating Expenses ..	104,100	112,000	112,000	122,000
Subtotal	104,100	112,000	112,000	122,000
Program Direction				
Operating Expenses ..	9,660	10,700	10,700	11,200
Subtotal	9,660	10,700	10,700	11,200
Total				
Operating Expenses ..	328,910	370,000	370,000	426,400
Capital Equipment ...	11,000	20,000	20,000	22,500
Construction	78,000	103,000	103,000	48,000
Total Naval Reactors Development	<u>\$417,910</u>	<u>\$ 493,000</u>	<u>\$493,000</u>	<u>\$496,900</u>
Total FTE's	209	213	213	213

Authorization: Section 31, P.L. 83-703

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

PROGRAM OVERVIEW
Naval Reactors Development

The Naval Reactors Development program is an integrated effort involving the design, development, improvement, testing, evaluation, and disposition of naval nuclear propulsion reactor plant components and cores. The objective is to enhance the performance, reliability, and safety of naval reactors while simplifying plant operating and maintenance requirements; and to design and develop advanced reactors for use in improving the capability of present and future nuclear powered naval warships.

Nuclear propulsion plants currently power over 40% of the Navy's first line combatant vessels. With nuclear power these ships are able to operate alone and unsupported for great periods of time, free from dependence on logistical support for propulsion fuel. Keeping these ships running is vital to the national defense -- the most survivable leg of our strategic defense triad depends on the success of this effort.

Equally important is continuing to develop advanced naval reactor plants. The U.S. Navy depends on continued improvement in all aspects of its warships to be able to meet its international commitments. The design and development of improved reactor plants is essential to maintaining the qualitative edge we currently enjoy over the Soviets in this important area.

As their capabilities increase, our warships must become even more resilient and survivable. Toward this end, the program emphasizes improvement of reactor plant features to facilitate casualty control and recovery from battle damage. Longer term efforts are directed toward developing advanced reactors with improved performance aimed at increasing maneuverability, enhancing target acquisition, reducing transit time to and from station, increasing overall effectiveness in a combat situation, increasing operating availability, reducing the need for costly refuelings, minimizing the production of nuclear waste, and reducing personnel radiation exposure.

In this regard, work is underway on an Advanced Fleet Reactor which will provide improved plant performance for the next generation of nuclear powered attack submarines; a Developmental Materials Core to evaluate the operational response of new reactor core poisons and materials; and a Submarine Test Core to test improved reactor fuels, materials, and configurations which could provide higher plant performance. Many recent advances made under the Naval Reactors Development program have been incorporated into operating plants. Continued monitoring, improvement, and testing of these advances is an important aspect of the program effort. This work includes: the S8G reactor plant used in the TRIDENT ballistic missile submarine and the higher power, longer life D2W core. Other ongoing efforts include: testing new reactor cores, components, concepts, and materials through the operation and servicing of eight land-based prototype nuclear propulsion plants; development and evaluation of new and improved fuels and materials for potential use in nuclear propulsion plants; investigation of reactor concepts which offer the potential of increased power density and longer life; improvement, evaluation, and technical support of existing nuclear propulsion plants, cores, components, systems, and materials; and development of replacement components and systems.

For Fiscal Year 1985, the Naval Reactors Development program budget request is \$496.9 million. This provides for continuation of work in the areas listed above. The \$3.9 million increase over the Fiscal Year 1984 budget is due to escalation and ongoing development work on advanced reactors. As part of the DOE initiative to obtain savings in the areas of administrative organization management, and administrative systems and processes, the Department was able to reduce this program by \$1.1 million.

DEPARTMENT OF ENERGY
FY 1985 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF CHANGES

ATOMIC ENERGY DEFENSE ACTIVITIES
NAVAL REACTORS DEVELOPMENT
(In thousands of dollars)

FY 1984 Appropriation enacted	\$493,000
<u>Plant Development</u>	
o Escalation; increased radiological control work	+4,900
<u>Reactor Development</u>	
o Net of decrease in Fuel Factory construction effort, and increases in Advanced Fleet Reactor equipment procurement and escalation	-11,500
<u>Reactor Operation and Evaluation</u>	
o Increase in prototype servicing and escalation.....	+10,000
<u>Program Direction</u>	
o Escalation	+500
FY 1985 Budget Request	\$496,900

I. REACTOR DEVELOPMENT

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
Operating Expenses	\$188,300	\$229,300
Capital Equipment	20,000	22,500
Construction	103,000	48,000
TOTAL	\$311,300	\$299,800

Reactor Development focuses on improving the power capability, reliability, and endurance of all types of naval reactors. Improvements are effected through the development of advanced reactor concepts and components and through incorporation of new reactor fuels and materials. Experience with operating reactors is also used in developing technology which leads to improved reactor performance.

Advanced reactor fuels are extremely important to improving the power and endurance of a naval reactor. Increasing core life heightens the need for advanced materials and for advanced analytical models to optimize core designs and arrangements.

Examination of spent reactor cores provides valuable information about core performance and the effects of reactor operation on reactor materials. Information gained from these examinations is vital to improving the performance of new cores. Combining this information with new developments in reactor technology requires careful engineering and sound analysis to ensure that the reactors will operate safely with optimal performance.

To prove out new concepts and designs, the Reactor Development effort also involves fabrication of prototype cores and components for installation, operation and testing in prototype reactor plants under operating conditions. To ensure that quality is maintained during manufacture of these prototype cores and components, Naval Reactors develops sophisticated manufacturing processes and inspection techniques. Evaluation of operating prototype equipment provides important data used to refine concepts and designs to be used for shipboard plants.

The Reactor Development portion of the Naval Reactors Development Program is broken down into five major areas: (a) Core Examination; (b) Materials Development; (c) Nuclear Design and Analysis; (d) Reactor Process Development; and (e) Reactor Technology.

a. Core Examination

Core Examination includes examination of expended cores and irradiated test specimens from the Advanced Test Reactor. Most core examination work is performed at the Expended Core Facility in Idaho, but the Bettis and Knolls Atomic Power Laboratories also examine limited amounts of irradiated material in specially designed hot cells.

The core examination work is particularly important in determining the behavior of reactor cores and materials under actual operating conditions. Examination of material removed from an operating reactor reveals information about fuel depletion rates, structural distortion, and mechanical behavior. Corrosion characteristics of reactor materials can also be determined. This information is then used to validate or revise reactor material and operating limits.

Specimens which have been irradiated in the Advanced Test Reactor are also tested under controlled conditions to evaluate specific aspects of reactor material performance. Using these tests design limits can be established, and determination can be made of failure margins.

During Fiscal Year 1985, examination of expended cores and irradiation test specimens will continue. Specific items of work will include: (1) examination of expended cores to evaluate actual performance and component conditions against predictions, particularly the S5G and S1C prototype cores; (2) examination of irradiated test samples from reactor material development programs; and (3) examination and testing of material condition in expended operational cores.

b. Materials Development

Instrumental to the development and safe operation of higher power, longer life cores is the use of advanced materials in those cores. The Materials Development effort involves development of improved materials and new material manufacturing processes to provide the materials needed for advanced cores.

Improvements in fuel, poison, cladding, and reactor structural materials are all essential to the development of advanced cores. Not only must these materials be suitable for use in naval reactor cores, they must also be viable for manufacture. Certain constraints apply to these materials. One important factor is to find fuel and poison materials which change dimension as little as possible over their lifetime. Understanding material corrosion properties and increasing resistance to corrosion is another important part of reactor materials development work. New materials developed in research programs are produced on a pilot-scale basis, and specimens are irradiated in an operating reactor environment. These specimens are then examined for dimensional change, structural integrity, and corrosion properties.

Development of cladding and reactor structural materials proceeds in the same manner. Potential alternate materials or heat treatments are irradiation tested and examined for usability in conjunction with specific fuel and poison materials.

Upon completion of testing, promising materials are qualified for production and use. Processes used in manufacturing the pilot specimens are incorporated into the full-scale material manufacturing effort.

To ensure that material performance can be accurately predicted, sophisticated inspection and testing techniques are developed. These techniques involve the use of computer technology to predict core corrosion and irradiation behavior and to establish design limits for the new fuel systems.

During Fiscal Year 1985, Naval Reactors will: (1) perform irradiation testing and examination of material specimens; (2) develop models to predict core corrosion behavior, and evaluate corrosion characteristics of operating cores; (3) develop, test, and evaluate new and current fuel, poison, cladding, and core structural materials; (4) develop improved materials testing and evaluation procedures; and (5) provide technical assistance to reactor core and component suppliers.

c. Nuclear Design and Analysis

The Nuclear Design and Analysis work provides for research and development in the fields of reactor physics, nuclear design of improved reactor cores, and analysis and testing of operational reactors. This effort is aimed at establishing and confirming reactor characteristics. Reactor shielding design and analysis work ensures that radiation levels experienced by operators or maintenance personnel remain at or below established limits. Safety analyses of reactor plants and fuel handling are performed to assure the safety of all operations.

Each of the areas of nuclear and reactor physics work involves the preparation of analytic models, the development of computer codes to characterize the models, and confirmation of the codes through test data and actual operating statistics. Based on data obtained from the models, critical experiments are conducted to mock-up and test advanced core fuel and poison loadings, composition, and geometries. These experiments help set core fuel and poison loadings and other characteristics needed for the design of improved cores.

Core geometries and fuel and poison loadings are also determined within the parameters of available space and power requirements. The ultimate objective of this work is to develop core designs which will meet all operational requirements while optimizing core depletion rates and minimizing adverse material conditions in the reactor. Operating data is subsequently evaluated to ensure core performance matches predictions and that cores are operating safely.

During Fiscal Year 1985 work in this area will include: (1) continued performance of physics and design calculations and analysis work; (2) completion of physics

acceptance and certification testing of the Submarine Test Core; (3) work on the Developmental Materials Core; and (4) continued development of advanced analysis techniques for physics and nuclear design work.

Work on reactor shielding is essential for the protection of reactor plant operating and maintenance personnel from exposure to radiation in excess of established limits. Shield surveys determine the effectiveness of reactor plant shielding during operation. Development of new shielding design methods and materials is an important and integral part of advanced reactor development. Design of refueling equipment, shipping casks, and shielded containers for refueling and shipping operations is another facet of this effort.

In Fiscal Year 1985 work will continue in these areas, including: (1) development of advanced shielding analysis methods, designs, and materials; (2) performance of shield design analysis and shield surveys of operating reactor plants; and (3) shielding analysis of refueling equipment.

Development of safety analysis techniques and performance of safety evaluations is carried out by means of modeling possible reactor plant accidents. These accident analyses aid in development of equipment and procedures to be used in the event of an actual casualty.

Control of special nuclear material must be assured to prevent unsafe configurations and to ensure that material accountability is maintained. Accountability for material being moved from storage to handling and processing facilities and back is essential to safe and secure operations.

Work in the areas of safety and safeguards in Fiscal Year 1985 will include: (1) preparation of safety analysis reports; (2) performance, evaluation and update of reactor protection analyses; and (3) continued control and accountability of special nuclear materials.

The development of improved reactors and components requires the latest advances in computer technology. Development and verification of designs and procedures requires automated analysis procedures and simulation techniques. To maximize the advantage realized from use of advanced computers, every effort is made to increase the productivity and capability of the computer systems by increasing the speed, degree of detail, and accuracy of problem solving.

d. Reactor Process Development

Reactor Process Development involves improving processes for the manufacture of naval reactor fuel, cores, and associated components. Throughout the evaluation of reactor and core designs attention must be given to the techniques necessary to turn designs into equipment.

Increasing reactor core power and life requires advanced fuel processing and manufacturing techniques. This includes development of a modified fuel process for possible use in the manufacture of advanced fuel elements.

Reactor Process Development also involves the transfer of naval nuclear fuel manufacturing technology to the new materials facility under construction at Savannah River, South Carolina and developing and qualifying new techniques in reactor core and core material manufacturing. Reactor Process Development work culminates in the production of advanced prototype fuel cells and reactor cores.

During Fiscal Year 1985, Reactor Process Development work will include: (1) continued development and preproduction of Advanced Fleet Reactor fuel elements; (2) transfer of fuel manufacturing technology to the Materials Facility at Savannah River; (3) development of Advanced Fleet Reactor fuel assemblies; (4) continuation of core design and engineering; and (5) continued development of the modified fuel process.

e. Reactor Technology

Reactor Technology is the portion of Reactor Development work which concentrates on the study and improvement of reactor components and systems and their interaction. The overall objective of this work - the design and development of advanced reactors having higher power, longer life, and increased reliability - is achieved through three principal activities: (1) design of reactor components to meet functional requirements; (2) analysis of the components to demonstrate acceptable performance against the requirements over their design lifetime; and (3) manufacture and testing of the components to ensure they will function properly under operating conditions. These components include reactor cores and support structures, pressure vessels and closure heads, core barrel assemblies, control rod drive mechanisms, and instrumentation for operation or special testing.

Key considerations in component design are optimizing the competing requirements of performance, serviceability, and reliability. Advancements realized through the Reactor Technology effort are directed toward making gains in one area without corresponding losses in others. It is this effort which makes possible higher performance and longer life cores with improved quieting. Thermal and structural analyses of reactor components aid in understanding the effects of temperature, pressure, flow, fatigue, shock, and vibration experienced by an operating reactor. This effort is aided by simulating operational conditions through computer analysis and then evaluating theories through operational testing.

Full scale models and prototype components are fabricated and tested to confirm performance against the design considerations. Equipment response in actual operation is evaluated through shock, vibration, and noise testing. Test loops provide controlled conditions for simulation of reactor system flow and its effects on components and systems. Thermal and hydraulic testing evaluates further aspects of the operating reactor environment. Data obtained from these tests aids in determining the suitability of developmental reactor components for normal operation in shipboard reactor plants. When applicable to installed equipment, the test data is incorporated in reactor plant and design manuals for current and future use.

In Fiscal Year 1985 Reactor Technology work will include: (1) continued qualification of noise and vibration design procedures and noise and vibration testing of prototype components; (2) performance of tests on developmental reactor components; (3) development of advanced computer analysis techniques for use in evaluating component design and performance; (4) fabrication of Advanced Fleet Reactor equipment, test models, and instrumentation; (5) procurement of Advanced Fleet Reactor components and materials; (6) continued analysis of Advanced Fleet Reactor component design; (7) operation of test loops to provide simulated operational conditions for testing of reactor components; (8) analysis and development work required for the installation of the Submarine Test Core in a prototype plant; (9) design of the Developmental Materials Core; and (10) development and analysis of design concepts for advanced reactors providing higher power and longer life.

Capital Equipment

Capital equipment requirements for Fiscal Year 1985 include the upgrading and replacement of site operating equipment. Improved and replacement equipment, components, and systems, such as reactor plant control, instrumentation, and detectors, site monitoring systems, and site telephone systems are required to continue improving reactor plant reliability and site efficiency.

The following types of capital equipment are necessary to accomplish programmatic objectives: (1) quality assurance equipment, including upgrading and metrification of measuring equipment; (2) process development equipment, such as laser and metal-working equipment; (3) laboratory engineering and test equipment, including pumps, laboratory transducers, and autoclaves; (4) analytic, spectrochemical and corrosion laboratory equipment, such as test units, systems and analyzers; (5) fabrication and inspection equipment, including manipulators, oscillographs, and miscellaneous replacement equipment; and (6) radiation and safety equipment such as survey meters, assay gauges and improved decay heat removal equipment for prototypes including remote instrumentation and control/readouts. In addition, improved and replacement equipment

components and systems, such as reactor plant control and instrument detectors and systems, are needed to continue to improve the reliability and plant efficiency of the prototype reactor plants and to provide for the analysis and examination of spent fuel assemblies and other components operated in nuclear propulsion plants. This includes: handling, processing, assembly and storage equipment, and various support equipment components.

Construction

In Fiscal Year 1985, major construction funds are requested for final funding of the Modifications and Additions to Prototype Facilities (MAPF), project number 81-T-112, and for continuation of the Materials Facility, project number 82-N-111.

The MAPF project provides for modifying and adding to the engineered safety features of several prototype plants. The prototype plants involved are the DLG and S3G plants at West Milton, New York, and the S1C plant located in Windsor, Connecticut.

The Materials Facility at Savannah River, South Carolina, will provide a second source for manufacture of naval nuclear fuel. This is the fourth year of project funding. The project is on schedule, as design work is almost completed and site construction is well underway at this time. FY 1985 work will include the installation of fuel manufacturing equipment into site buildings and the completion of major building construction efforts.

General Plant Project funds provide for minor plant improvements, alterations, additions, and minor new construction at Naval Reactors' laboratories. The work contemplated under these projects will provide continuity of present and planned operations, contribute to operating efficiencies, eliminate potential health and fire hazards, reduce operating costs, and provide facilities to take full advantage of technological advances. In general, these projects consist of land improvements, building alterations, utility improvements, and additions to or upgrading of existing facilities. The estimate for Fiscal Year 1985 General Plant Projects is based on experience in prior years and also takes into consideration minor facilities expansion or renovation activities required for performance of program research and development effort.

II. PLANT DEVELOPMENT

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
Operating Expenses	\$59,000	\$63,900

The Plant Development portion of the Naval Reactors Development program is aimed at enhancing reactor plant capability exclusive of the reactor itself, with primary emphasis on improving plant reliability and performance, increasing ease of plant operation and maintenance, and improving plant shock resistance. Principal efforts include the development of improved reactor and steam plant components and systems, alternate plant structural materials, improved heat treatment methods to reduce corrosion, and new methods for chemistry treatment and water purification.

This Plant Development work is important because propulsion plant characteristics cannot be improved solely through work on the reactor. To realize any significant increase in overall propulsion plant capability, plant development work must progress hand in hand with advances in reactor technology.

Component and system development work is a vital part of efforts to improve reactor plant performance. In addition, reactor plant arrangement studies provide initial limits and direct the overall size and organization of components and systems, which are then designed, tested, and evaluated within these limitations. Full-scale mock-ups are used to verify the suitability of the design, and assure that the plant will fit the designated parameters.

Safe and reliable reactor plant operation requires knowledge and understanding of the interaction of different materials and water chemistries. This entails extensive

testing and evaluation of alternate materials, heat treatments and water chemistries. Those candidates with the potential for improving plant performance are then examined under prototypal conditions to qualify them for actual reactor plant use.

Plant Development work is broken into two categories: (a) Materials, Chemistry and Supporting Development; and (b) Plant Technology.

a. Materials, Chemistry, and Supporting Development

Work in this category involves the development, testing, and evaluation of materials for use in all reactor plant components and systems except the reactor. This includes evaluation of these materials in various water chemistries, research into chemical cleaning methods, and development of improved radiological monitoring and control techniques and procedures.

The continued safe and reliable operation of naval reactor plants as these plants age requires a sound understanding of the properties and characteristics of materials used in reactor plant systems. Because of the consequences of a material failure in a reactor system there is a comprehensive testing and evaluation program involving materials currently in use and potential alternate materials. The purpose is to ensure that material performance can be consistently and accurately predicted. Accelerated testing screens out many alternative materials with unacceptable characteristics. The more promising material candidates are then subjected to long term testing in a reactor environment to observe material corrosion, fatigue, and wear. These tasks provide data useful in determining reactor plant operating and servicing requirements and procedures. These data are also provided to reactor plant component suppliers to take into account in the design and manufacture of their equipment.

During Fiscal Year 1985, reactor plant material research work will include: (1) evaluation of reactor plant component materials for adequacy in specific applications; (2) development of test data and evaluation of corrosion, wear, and fatigue of materials in plant applications; (3) continuation of laboratory quality assurance programs to ensure test control and material conformance to specifications; and (4) determination of material condition and potential for extending the life of existing reactor plants.

Water chemistry control is another important aspect of maintaining plant reliability and effective operation. Different water chemistries can have a variety of effects on plant materials during the life of a reactor. The objective of the water chemistry and purification research is to determine which water chemistry has the least effect on plant material while keeping the coolant as free from sludge and crud as possible.

Water chemistry and purification work in Fiscal Year 1985 will include: (1) testing of various steam generator cleaning techniques; (2) testing of improved water chemistry treatment; (3) development of improved methods for reactor plant decontamination; (4) research into the interactions of water chemistry with respect to material corrosion; and (5) development of new purification media.

All Naval Nuclear Propulsion Program activities operate under Government regulations concerning occupational radiation exposure and release of radiation to the environment. A rigorous program of radiological control is in place to ensure the continued historically safe operation of these facilities. Development of improved procedures and techniques for radiological monitoring and control adds to the effectiveness of radiological control programs.

In Fiscal Year 1985, work in this area will include: (1) personnel and area radiation monitoring; (2) training of radiological technicians; (3) development of new surveillance techniques and containment designs; (4) analysis of the environmental impact of naval reactor operation; and (5) waste management activities.

b. Plant Technology

The Plant Technology portion of the Plant Development effort is aimed at improving the capabilities of reactor plant systems. These systems include: primary plant fluid, mechanical, and electrical systems and instrumentation, reactor plant control systems and components; and primary and secondary plant components. The objectives of this work are to design components and systems for new reactor plants and improve those in operating plants. Successful applications of this effort result in reduced maintenance requirements, increased reliability, and simplified operating procedures for naval reactor plants.

Improvement of plant capabilities begins with determining the desired characteristics of the plant. After the operating parameters are set and size and weight of the reactor compartment established, there are arrangement studies to determine the optimal size and arrangement for components inside the reactor compartment. New materials qualified for use are factored into component designs. Simulated abnormal and casualty plant operating conditions are also investigated to ensure proper prediction of plant performance.

Naval Reactors will do the following work in this area in Fiscal Year 1985: (1) continue to perform plant analyses and develop and maintain operating and casualty procedures to allow continued plant operation; (2) continue to upgrade engineered safety systems for land-based prototype reactor plants; (3) continue to evaluate reactor plant component performance and design new components; and (4) evaluate material performance in operating components.

Electrical components and instrumentation and control systems are another essential constituent in the continued safe and reliable operation of naval reactor plants. Potential casualty situations are identified and resolved by these components, which incorporate the most modern advances in electronic and microprocessor technology. Test and operational data from experiments, prototype plants, and operating ships are taken into account in the design process. They are also evaluated to ensure electrical components and instrumentation and control systems are operating according to specifications.

During Fiscal Year 1985 work on advanced instrumentation and control equipment will include continuing: (1) the design of microprocessor-based instrumentation and control equipment; (2) the upgrade and improvement of prototype reactor plant electrical and instrumentation and control systems; and (3) performance analyses of electrical systems.

Other Plant Technology work in Fiscal Year 1985 includes maintaining engineering liaison with shipyards performing work on nuclear powered ships, revising reactor plant manuals to reflect modified and improved designs, and operating multi-purpose test facilities for use in evaluating problems and improving plant performance.

III. REACTOR OPERATION AND EVALUATION

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
Operating Expenses	\$112,000	\$122,000

Reactor Operation and Evaluation involves the operation, servicing, upgrading, and testing of the eight land-based prototype nuclear propulsion plants. These prototypes are operated to test developmental concepts, components and cores for naval nuclear propulsion plants. Although a great deal of testing is done in the other Naval Reactors Development budget categories, no amount of analysis or accelerated testing can provide the data which can be obtained from the actual in-service experience obtained by operating the prototypes. Confirmation of design suitability and adequacy for use can be determined only by actual operation. Performance of this testing in the prototype plants allows a lead time of two to three years in evaluation of plant conditions ahead of actual fleet operating experience. The lead time obtained by operating the prototype plants provides valuable information used in operating and maintaining fleet propulsion plants. Additionally, performance of this testing in

prototype plants avoids interference with fleet activities. These prototypes are fully instrumented to provide data needed for the evaluation of reactor plant equipment.

Servicing of the prototype plants is also carried out. The servicing work includes maintenance, refuelings, disassembly, fuel exchange and reassembly, component examination, and component removal and replacement. Equipment and procedures for performing this servicing work are developed and refined, and are used to the maximum extent possible in carrying out fleet servicing work.

Reactor Operation and Evaluation can be broken into three ongoing efforts: (1) Reactor Servicing and Refueling; (2) Reactor Engineering and Analysis; and (3) Reactor Operation and Testing.

a. Reactor Servicing and Refueling

Reactor Servicing and Refueling covers the servicing and refueling of prototype reactor plants and associated preparations and equipment required for these operations. Included in this effort are the design of refueling systems, the design, development and fabrication of prototype reactor servicing equipment, and the development of servicing techniques and procedures. Extensive checkout of these procedures, systems, and equipment is accomplished to ensure servicing and refueling operations are conducted safely. Should problems appear during checkout or the actual servicing operations, engineering analysis is applied to a solution of the problems, and appropriate revisions made to preclude their recurrence.

This effort also includes maintaining an ability to handle emergent servicing needs. Servicing personnel are selected and trained. Additional effort includes the disposal of removed components, design and development of shipping containers for new and spent fuel and irradiated components, and testing and analysis of those shipping containers.

In Fiscal Year 1985, Naval Reactors will: (1) continue design, development, and checkout of servicing and refueling systems, equipment, and procedures; (2) commence the S5G prototype plant refueling and overhaul; (3) complete the D1G prototype plant interim inspection and overhaul; and (4) continue preparations for other prototype plant servicing efforts, including refuelings and overhauls of the S1W and S3G prototypes.

b. Reactor Engineering and Analysis

Reactor Engineering and Analysis work is aimed at evaluating the performance and condition of operating reactors and reactor components to ensure their continued ability to operate within design specifications. Testing and examining the prototype reactor plants provides valuable data on how this equipment reacts in an operating reactor environment.

A variety of tests provides data on reactor equipment. Thermal and hydraulic analyses establish reactor performance capability in relation to power distribution. Core power limits and operating procedures can be defined based on data obtained from these analyses. Testing of flow rates and temperature distributions through the life of a core provides a basis for comparing actual performance with predictions. This comparison becomes increasingly important with the extension of reactor core life.

Operational data obtained from the prototype plants provides important input into the design of new cores and reactor components. Abnormal operating conditions can be analyzed and factored into new designs, and the effects of reactor operation can be assessed with respect to core structural components and other reactor equipment.

Reactor Engineering and Analysis work in Fiscal Year 1985 will include: (1) continued performance of thermal, hydraulic analysis and noise testing on prototype plants; (2) evaluation of the adequacy of reactor components to meet design specifications; and (3) continued design analytic efforts for installation and operation of upgraded prototype systems.

c. Reactor Operation and Testing

This work covers the day-to-day operation of the prototypes, and the associated testing. Operation of these plants in a manner simulating shipboard conditions requires prompt resolution of operational and equipment problems, continuous maintenance of all reactor and steam plant systems, and continued review of plant operating conditions to ensure safe plant operation.

The testing performed at the prototypes provides valuable information used in the research and development program. Additionally, the prototypes serve to train Navy personnel as reactor plant operators and provide them controlled hands-on experience with a nuclear propulsion plant prior to their entrance into the fleet.

During Fiscal Year 1985, prototype plants not shut down for servicing will continue operating to test developmental cores, components, and systems, provide valuable data for use in evaluating operating ship conditions, and train reactor plant operators. Routine maintenance and minor servicing will be performed on all prototype plants. Specific work items will include: (1) performance of reactor plant nuclear, thermal, hydraulic, and mechanical tests, plant modifications, maintenance and training, and operation of plant support systems for the prototypes; (2) installation of instrumentation and control modifications; (3) facilities modifications; and (4) performance of overhaul and maintenance items.

IV. PROGRAM DIRECTION

	<u>FY 1984 Appropriation</u>	<u>FY 1985 Request</u>
Operating Expenses	\$10,700	\$11,200

The program direction funds provide for salaries, benefits, travel, and other expenses for 213 full time Federal employees at the Naval Reactors, Pittsburgh Naval Reactors, and Schenectady Naval Reactors Offices in support of the Naval Reactors Development and Water Cooled Breeder programs.

The Naval Reactors Development program provides support for 142 nuclear powered warships which comprise over 40 percent of the Navy's combatant fleet, including a vital part of this Nation's strategic deterrence force. Augmenting this support is the development of improved nuclear propulsion plants incorporating the latest advances in reactor technology, materials, fuels, and manufacturing techniques. These plants are used in the Navy's advanced nuclear powered warships. Another program supported by Naval Reactors personnel is the Water Cooled Breeder program, which will evaluate the Light Water Breeder Reactor performance. The Light Water Breeder Reactor was the only water cooled breeder reactor ever operated in the United States to supply commercial electric energy.

Naval Reactors' personnel maintain close program management and technical direction of the Bettis and Knolls Atomic Power Laboratories and associated facilities, with a combined employment of about 6,500. These laboratories are Government-owned, contractor-operated facilities solely devoted to the Naval Reactors program. This effort includes: development of advanced reactor concepts and technology, reactor fuels and materials, and reactor plants with higher power and longer life; operation of eight land prototype reactor plants; coordination, oversight, and technical control of over more than 800 subcontractors; design and procurement of developmental prototype reactor cores; and technical support for the reactor plants in 142 operating nuclear powered ships, as well as 31 nuclear powered ships authorized or under construction. As part of this effort, there is close coordination and interface with Naval Reactors' Navy personnel to ensure an informed and orderly joint program.

Naval Reactors operates with austere staffing. Existing personnel are used to the greatest extent practicable in staffing new efforts and expansions of existing programs. Improvements in work force productivity have been achieved over the years, despite increasing workloads, by effective use of available staff.

The positions requested in Fiscal Year 1985 are needed to support ongoing programs. These efforts will include: sophisticated core development work aimed at developing high performance cores, advanced material and component development; light water breeder reactor core evaluation; prototype operation and servicing efforts; and increasing plant support work reflecting the growing age, number and diversity of operating ship and prototype reactor plants.

DEPARTMENT OF ENERGY
 FY 1985 CONGRESSIONAL BUDGET REQUEST
 CONSTRUCTION PROJECT OVERVIEW
 NAVAL REACTORS DEVELOPMENT
 (In thousands of dollars)

<u>Project Number</u>	<u>Project Title</u>	<u>TEC</u>	<u>FY 1984 Appropriations</u>	<u>FY 1985 Request</u>
85-N-101	General Plant Projects	\$ 2,000	\$ 0	\$ 2,000
84-N-101	General Plant Projects	2,500	2,500	0
83-N-102	Additions to the Radioactive Materials Laboratory	8,000	6,500	0
82-N-111	Materials Facility	176,000	70,000	40,000
81-T-112	Modifications and Additions to Prototype Facilities	110,000	<u>24,000</u>	<u>6,000</u>
TOTAL			\$103,000	\$ 48,000

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS

Atomic Energy Defense Activities
Naval Reactors Development

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

1. Title and location of project: General Plant Projects	2. Project No. 85-N-101
3. Date A-E work initiated: 1st Qtr. - FY 1985	5. Previous Cost Estimate: None
Date: N/A
3a. Date physical construction starts: 1st Qtr. - FY 1985	6. Current Cost Estimate: \$2,000
Date: June 1983
4. Date construction ends: 3rd Qtr. - FY 1986	

7. Financial schedule

Fiscal Years	Obligations	COSTS			
		FY 1983	FY 1984	FY 1985	After FY 1985
Prior Years:	\$ 000	\$2,019	\$1,700	\$1,800	\$ 1,100
1983	1,500	000	800	600	100
1984	2,500	000	900	900	700
1985	2,000	000	000	800	1,200
		\$2,019	\$3,400	\$4,100	\$ 3,100

8. Brief physical description of project

This project provides for minor plant improvements, alterations, additions, and minor new construction at Naval Reactors' laboratories. In general, these projects consist of land improvements, building alterations, utility improvements, additions to existing facilities, and upgrading present facilities. The work contemplated under this project will provide continuity of present and planned operations, contribute to operating efficiencies, eliminate potential health, fire, and safety hazards, reduce maintenance and operating costs, and provide facilities to take full advantage of technological advances.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: General Plant Projects 2. Project No. 85-N-101

8. Brief physical description of project (continued)

The estimate is based on the past experience of the operations offices, with individual requirements as follow:

Pittsburgh Naval Reactors Office	\$1,000,000
Schenectady Naval Reactors Office	\$1,000,000

9. Purpose, justification of need for, and scope of project

The estimate for FY 1985 general plant projects is based on experience in prior years, and takes into account new plant and other facilities which are coming into operation, and certain special non-recurring projects, which, because of their nature, fall within the criteria for general plant projects.

In the past, work under general plant projects has included modifications or betterments to existing buildings and other facilities; additions to buildings to house new equipment or personnel; construction of new, small buildings; replacement or additions to roads and utility lines; and general area improvements and development programs to provide for safe and economic operation.

Listed below are examples of proposed subprojects:

a. Water Room Upgrade \$ 500,000

This project provides for replacement and upgrading of equipment supplying pure degassed water for high pressure loop facilities. Also included are necessary storage tanks and heating equipment. The present system is deteriorating and the controls are marginal. In addition, maintenance on this system has been excessive.

b. ECF Hot Cell Maintenance Area \$ 900,000

This facility consists of a containment area adjacent to the ECF hot cells which will be utilized for the repair of contaminated hot cell equipment. The facility will contain breathing air, operational support facilities (electrical, water, shop air, etc.).

The facility will be set up for remote observation and decontamination operations. The facility will eliminate transfer of contaminated items out of cell and thus reduce personnel exposure and improve radiological controls.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: General Plant Projects 2. Project No. 85-N-101

10. Details of cost estimate

Details of cost estimates for this project are not available at this time. Detailed cost estimates for general plant projects are normally made in connection with the request for directive after the need for the work has been established, the job has been scoped, and preliminary engineering completed.

11. Method of performance

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

12. Funding schedule of project funding and other related funding requirements

Not required.

13. Narrative explanation of total project funding and other related funding requirements.

No narrative required.

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS

Atomic Energy Defense Activities
Naval Reactors Development

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

1. Title and location of project: Materials Facility,
Savannah River, South Carolina	2. Project No. 82-N-111
3. Date A-E work initiated: 1st Qtr. - FY 1982	5. Previous cost estimate: \$176,000
Date: August 1982
3a. Date physical construction starts: 2nd Qtr. - FY 1983	6. Current cost estimate: \$176,000
Date: June 1983
4. Date construction ends: 3rd Qtr. - FY 1986	

7. Financial schedule of construction project funding:

<u>Fiscal Year</u>	<u>Authorization</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
1982	\$15,000	\$15,000	\$15,000	\$ 9,170
1983	\$40,000	\$40,000	\$40,000	\$17,689
1984	\$70,000	\$70,000	\$70,000	\$55,000
1985	\$40,000	\$40,000	\$40,000	\$57,500
1986	\$11,000	\$11,000	\$11,000	\$36,641

8. Brief physical description of project funding:

This project provides a materials facility at Savannah River, South Carolina as a second source to manufacture fuel from highly enriched uranium for further fabrication into cores for naval nuclear propulsion systems.

The process equipment will be enclosed in a new building located in the F Chemical Separations Area. The main building is designed to contain 80,000 ft² on the first floor and 20,000 ft² on the second floor. The process area within the main building contains 27,300 ft² on the first floor and 13,700 ft² on the second floor. Interior surfaces will be finished in a manner to ensure cleanliness. The building will be partitioned so as to subdivide the interior of the facility into

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Materials Facility
Savannah River, South Carolina

2. Project No. 82-N-111

8. Brief physical description of project funding: (continued)

zones to facilitate material control. Office and personnel facilities including change rooms will be provided in the main building (about 11,000 square feet). The main building also includes a warehouse of approximately 6,000 square feet and a waste water treatment facility having a capacity of about 3,000 gallons per day (gpd).

Enclosures will be provided for major equipment pieces containing enriched uranium. Ventilation will be supplied to the building and the enclosures in such a manner as to control possible releases of uranium compounds. All ventilation air will be exhausted through high efficiency particulate air filters. The process steps to be employed will be patterned after the process used at the other naval fuel manufacturer. The process involves the conversion of highly enriched uranium into fuel materials suitable for use in fabricating naval reactor cores. The fuel manufacturing process is complex, involving highly sophisticated chemical and metallurgical technology involving at least ten changes of state of material handled, i.e., gaseous, liquid and solid, and over 60 separate processing steps.

Manufacturing must be closely controlled, and the total system must be designed to preclude nuclear criticality accidents. Provisions are included for scrap recovery and recycle, waste treatment and recovery, and recycle of analytical and process control samples.

Special provisions will be included to ensure material control and accountability, physical safeguards and protection against fire. The process area of the building will be a high resistance structure and an interior fuel vault will be a maximum resistance structure.

9. Purpose, justification of need for, and scope of project:

The purpose of this project is to construct a Materials Facility to provide a second source of supply for naval nuclear fuel. The Department of Energy is presently dependent on only one supplier for the nuclear fuel used in the production of cores for the Navy's nuclear powered ships. Such dependence subjects the DOE to the risk of prolonged disruption in fuel supplies because of strikes, operational shutdowns, natural catastrophes, or other unanticipated problems. The added capacity provided by this project will also allow flexibility to accommodate an expanded shipbuilding program.

An assured supply of naval nuclear fuel is vital. Nuclear powered warships constitute over 40 percent of the Navy's combatant fleet. The vulnerability arising from sole source dependence for naval nuclear fuel is real and immediate, imposing an unacceptable risk on the ability to meet National security requirements. Accordingly, development of a second source for naval nuclear fuel is a matter of high priority.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Materials Facility
Savannah River, South Carolina

2. Project No. 82-N-111

Efforts to get sources familiar with manufacturing highly enriched naval fuel in the private sector to invest in a fuel plant have been unsuccessful. The high cost of facilities required in relation to the potential volume of business, coupled with the needs for extensive safety, security and safeguards requirements and risk and uncertainty involved in production activities associated with highly enriched uranium, precludes this from being a commercially viable venture.

The design basis for the facility will be round-the-clock (24 hr./day, 7 days per week) with an overall attainment of 75%. Provisions will be included to meet all applicable environmental requirements, occupational and health standards and regulations pertinent to energy conservation.

The FY 1985 appropriation request of \$40 million for Construction funds is to provide for:

- a. Procurement of remaining purchased material and equipment.
- b. Completion of cabinet installation in the manufacturing building and turnover of some process areas to operations.
- c. Completion and turnover of shops, vaults, and mechanical equipment rooms to operations.
- d. Completion of laboratory construction and installation of laboratory equipment.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Materials Facility
Savannah River, South Carolina

2. Project No. 82-N-111

10. Details of cost estimate:

Item	(Dollars in Thousands)	
	Item Cost	Total Cost
A. Engineering Design and Inspection at 32% of item B.		\$ 39,000
B. Construction Costs		\$121,640
1. Improvement to Land	\$ 900	
(a) Roads, Walks & parking (contract)	335	
99 SY Road & Parking Area		
Concrete Curbs, Gutter & Walk		
(b) Fences & Gates (contract)	85	
3600 LF Chain Link Fence		
(c) Excavation & GrAding (contract)	185	
6 acres, 53K cubic yd. fill		
(d) Landscaping (Contract)	230	
8 acres		
(e) Miscellaneous	65	
2. Buildings	\$ 15,740	
(a) FMF Building	4,080	
Frame (Contract).....	10,830	
97,325 Sq. Ft. irregular shaped		
2-story metal siding Bldg.		
approx. size 283' x 363'		
(b) Bottled Gas Storage Bldg (Contract)	20	
168 Sq. Ft. 1-story Masonary Bldg.		
(c) Gate House	295	
725 Sq. Ft. 1-story Masonary Siding		
Concrete Bldg.		

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Materials Facility
Savannah River, South Carolina

2. Project No. 82-N-111

10. Details of cost estimate: (Continued)

(d) Sanitary Treatment Storage Bldg 25
(Contract)
(e) Stack (Contract) 490
9' diameter x 130' high

3. Special Facilities

\$88,700

(a) Conversion/Finishing 33,250
(b) Scrap Recovery 22,950
(c) Assay Facilities 2,800
(d) Storage, Aux. Suppt. Facs 20,350
(e) Shops 370
(f) Electrical 3,350
(g) Health Protection 3,960
(h) Security 1,670

4. Utilities

\$ 8,300

(a) Services Piping -Overhead 1,480
-UG Contract 1,580
(b) Refrigeration 1,150
Cooling Tower Contract 660
(c) Sanitary Waste Treatment-Contract 410
(d) Electric Service 1,900
(e) Safety & Fire Alarm 820
(f) Communications 300

5. Miscellaneous

\$ 8,000

C. Removal Costs

\$ 60

1. Electrical Distrib. & Fence 40

2. Sewers & Fire Line (Const.) 20

Subtotal (Items A,B, and C)

\$160,700

605

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Materials Facility
Savannah River, South Carolina

2. Project No. 82-N-111

10. Details of cost estimate: (Continued)

D. Contingencies at approximately 9% of above costs

\$ 15,300

Total Project Cost

\$176,000^{a/}

11. Method of Performance:

Design will be performed by the operating contractor. Construction and procurement will be accomplished by the operating contractor, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

12. Schedule of project funding and other related funding requirements:

A. Total Project Funding

	Prior Years	FY 83	FY 84	FY 85	FY 86	Total
1. Total Facility Costs						
a. Construction Line Item	9,170	17,689	55,000	57,500	36,641	176,000
b. PE&D	0	0	0	0	0	0
c. Expense Funded Equipment	0	0	0	0	0	0
d. Inventories	0	0	0	0	0	0
Total Facilities Costs	9,170	17,689	55,000	57,500	36,641	176,000
2. Other Project Funding	Prior Years ^{b/}	FY 83 ^{c/}	FY 84 ^{c/}	FY 85 ^{c/}	FY 86 ^{c/}	Total
a. R&D (Engineering Studies)	1,600	100	200	300	-	2,200
(R&D)	3,850	2,750	2,350	2,350	500	11,800
b. Other Project Related Costs	5,050	4,200	5,900	10,400	11,900	37,450
Total Other Project Funding	10,500	7,050	8,450	13,050	12,400	51,450
Total Project Funding	19,670	24,739	63,450	70,550	49,041	227,450

^{a/}This estimate based upon firm design at 59% complete. (Conceptual Design was 100% complete in FY 1981.)

^{b/}Includes FY 82 and earlier funding

^{c/} FY 1983 dollars.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Materials Facility
Savannah River, South Carolina

2. Project No. 82-N-111

12. Schedule of project funding and other related funding requirements: (Continued)

B. Total related annual costs (estimated life of project: 20 years) a/

1. Facility Operating Costs	\$32,000
2. Programmatic Operating Expenses Directly Related to the Facility	0
3. Capital Equipment Not Related to Construction but Related to the Programmatic Effort in the Facility	1,000
4. GPP or Other Construction Related to Programmatic Effort in the Facility	0
5. Other Costs	0
Total Other Related Annual Costs	\$33,000

13. Narrative explanation of total project funding and other related funding requirements:

A. Total Project Funding

1. Total Facility Cost

- a) Construction Line Item
- b) PE&D
None
- c) Expense Funded Equipment
None
- d) Inventories
None

2. Other Project Funding

- a) R&D (Engineering Studies and R&D)
These funds are for optimization studies and completion of development and demonstration studies.
- b) Other Project Related Costs
Project liaison, pre start-up and start-up expenses

a/ FY 1983 dollars

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CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Materials Facility
Savannah River, South Carolina

2. Project No. 82-N-111

13. Narrative explanation of total project funding and other related funding requirements: (Continued)

B. Total Related Funding Requirements

1. Facility Operating Costs

Includes a full staff of operating and support personnel to operate on a 7 day, 4 shift schedule and operating suppliers.

2. Programmatic Operating Expenses Directly Related to the Facility

None

3. Capital Equipment Not Related to construction but related to the Programmatic Effort in the Facility

Includes equipment replacement on a normally expected frequency to continue viable facility operation.

4. GPP or Other Construction Related to Programmatic Effort in the Facility Forecast

None

5. Other Costs

None

Department of Energy
FY 1985 CONGRESSIONAL BUDGET REQUEST

CONSTRUCTION PROJECT DATA SHEETS

Atomic Energy Defense Activities
Naval Reactors Development

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

1. Title and location of project: Modifications and Additions to
Prototype Facilities
Various Locations

2. Project No. 81-T-112

3. Date A-E work initiated: 2nd Qtr. - FY 1981

5. Previous cost estimate: \$110,000
Date: December 1982

3a. Date physical construction starts: 3rd Qtr. - FY 1982

6. Current cost estimate: \$110,000
Date: June 1983

4. Date construction ends: 4th Qtr. - FY 1986

7. Financial schedule:

	<u>Fiscal Year</u>	<u>Authorizations</u>	<u>Appropriations</u>	<u>Obligations</u>	<u>Costs</u>
	Prior Years	\$103,000	\$45,000	\$45,000	\$ 9,133
	1983	0	35,000	35,000	18,826
	1984	1,000	24,000	24,000	32,500
	1985	6,000	6,000	6,000	32,830
	1986	0	0	0	16,711

8. Brief physical description of project:

This project provides for modifying the engineered safety features of several naval prototype nuclear propulsion plants, principally the S3G, S1C, and D1G land-based prototypes at West Milton, NY (S1C at Windsor, CT). These prototypes are currently used in the research and development of naval nuclear reactor designs and as training facilities for operation of naval nuclear plants. This work will provide system capabilities similar to those installed in the newest prototypes. The upgrading is identified as part of an ongoing review and will be carried out in conjunction with the planned refuelings of these plants.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Modifications and Additions to Prototype Facilities	2. Project No. 81-T-112
Various locations	

9. Purpose, justification of need for, and scope of project:

The purpose of the project is to modify and make additions as necessary to the land-based prototype nuclear propulsion plants in light of upgraded requirements for engineered safety features such as those defined by the Code of Federal Regulations.

Subsequent to the construction and initial operation of these prototypes, the Code of Federal Regulations requirements for engineered safety features has undergone extensive revisions. Although all the prototypes have had an outstanding safety and performance record since their initial operation, this project will enhance the continued safe operation of these prototype plants. Upgrading of the prototypes in light of the latest Code of Federal Regulations and to take advantage of continuing advances in the state of the art in reactor safety is desirable at this time because of the fact that the needed changes can be most efficiently implemented in conjunction with planned refuelings.

The prototypes are used for research and development of NR designs and to train crews for the Navy. Therefore, it is important that the upgrading be coordinated with prototype operations in order to minimize the impact on scheduled test programs and crew training. To accomplish this, the proposed construction program for the prototype facilities and equipment principally involved is compatible with scheduled prototype shutdowns for refueling and maintenance.

The project will include the design, procurement, and installation of improved engineered safety system capability for these naval prototype nuclear propulsion plants. Upgrading of reactor plant controls and systems, and construction of plant support buildings to house the equipment is included. In addition, auxiliary control rooms will be designed and installed to provide for the backup remote control of engineered safety systems and monitoring of these prototypes should emergencies occur. The necessary engineering and design effort is also incorporated to ensure the new equipment will be compatible with the existing prototype systems.

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Modifications and Additions to
Prototype Facilities

2. Project No. 81-T-112

Various locations

9. Purpose, justification of need for, and scope of project (continued):

The FY 1985 Appropriation Request of \$6 million for Construction Funds is to provide for:

- a. Placement of remaining contracts for modifications to plants, which include S3G in-hull modification tie-ins and S3G hull support modifications.
- b. Completion of the installation of engineered safety systems, inclusive of tunnel systems.
- c. Continuing engineering and construction management of construction installation work.

10. Details of cost estimate

Item Cost

Total Cost

- a. Engineering, Design and Inspection
at 35% of item b.

\$ 23,400

1. Architect Engineer Service
2. KAPL Design and Inspection

\$17,400
6,000

- b. Construction

66,163

1. Improvements to Land 20
2. New Building Construction or Remodeling. 20,900
3. Other Structures 4,850
4. Special Facilities
 - a. Engineering Equipment 9,613
 - b. System Installation 30,600
5. Utility Work 180

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Modifications and Additions to Prototype Facilities
Various locations

2. Project No. 81-T-112

c. Standard Equipment	<u>15,437</u>
Subtotal	105,000
d. Contingencies at 4.5% of above costs	<u>5,000</u>
Total Estimated Project Cost	\$110,000 ^{a/}

^{a/}This estimate is based upon completed conceptual design.

11. Method of Performance:

Design and inspection will be performed in part under a negotiated architect-engineer contract and in part by the operating contractors. Construction, procurement, and installation of test equipment will be accomplished by contracts awarded on the basis of competitive bidding to the maximum extent possible.

12. Schedule of project funding and other related funding requirements:

	Prior Years	FY 1983	FY 1984	FY 1985	FY 1986	Total
a. Total project funding						
1. Total facility costs						
(a) Construction line item	\$ 9,133	\$18,826	\$32,500	\$32,830	\$16,711	\$110,000
(b) PE&D	0	0	0	0	0	0
(c) Expense funded equipment	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0
Total facility costs	\$ 9,133	\$18,826	\$32,500	\$32,830	\$16,711	\$110,000
2. Other project funding:						
(a) R&D (Engineering Stud.)	\$ 1,200	\$ 100	\$ 0	\$ 0	\$ 0	\$ 1,300
(b) Other Projected Related Cost	0	0	0	0	0	0
Total Other Project Funding	\$ 1,200	\$ 100	\$ 0	\$ 0	\$ 0	\$ 1,300
Total Project Funding	\$10,333	\$18,926	\$32,500	\$32,830	\$16,711	\$111,300

CONSTRUCTION PROJECT DATA SHEETS

1. Title and location of project: Modifications and Additions to
Prototype Facilities

2. Project No. 81-T-112

Various locations

12. Schedule of project funding and other related funding requirements (continued):

- b. Total related funding requirements (estimated life of project: 20 years)
- 1. Facility operating costs0
 - 2. Programmatic operating expenses directly related to the facility0
 - 3. Capital equipment not related to construction but related to the programmatic effort in the facility0
 - 4. GPP or other construction related to programmatic effort in the facility0
 - 5. Other costs
 - Total other related annual funding and other related funding requirements0

13. Narrative explanation of total project funding and other related funding requirements:

1. (a) Construction line item
No narrative required
2. (a) R&D (Engineering Studies)
Elements of cost to be charged as R&D expense for conceptual design work include:
(1) preparation of System Design Descriptions (SDD's) which will be utilized for the basis of project design.
(2) performance of geotechnical and other engineering studies to establish system design parameters.
Technical data and other project information developed as a result of this work will provide the basis for Project Preliminary Design (Title I).

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